

Chan Yuen Fook · Gurnam Kaur Sidhu
Suthagar Narasuman · Lee Lai Fong
Shireena Basree Abdul Rahman *Editors*

7th International Conference on University Learning and Teaching (InCULT 2014) Proceedings

Educate to Innovate

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Editors

Chan Yuen Fook
Faculty of Education
Asian Centre for Research on University
Learning and Teaching
Universiti Teknologi MARA
Selangor, Malaysia

Gurnam Kaur Sidhu
Faculty of Education
Asian Centre for Research on University
Learning and Teaching
Universiti Teknologi MARA
Selangor, Malaysia

Suthagar Narasuman
Faculty of Education
Asian Centre for Research on University
Learning and Teaching
Universiti Teknologi MARA
Selangor, Malaysia

Lee Lai Fong
Faculty of Education
Asian Centre for Research on University
Learning and Teaching
Universiti Teknologi MARA
Selangor, Malaysia

Shireena Basree Abdul Rahman
Faculty of Education
Asian Centre for Research on University
Learning and Teaching
Universiti Teknologi MARA
Selangor, Malaysia

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Preface

The Asian Centre for Research on University Learning and Teaching (ACRULeT), located at the Faculty of Education, Universiti Teknologi MARA in Shah Alam, Malaysia, held the 7th International Conference on University Learning and Teaching (InCULT) on 2–3 December 2014. InCULT is a biennial conference held by ACRULeT since 2002. The conference aims at providing a platform for the extensive discussion and exchange of ideas between experts in education. Apart from that, it also seeks to explore new directions and possibilities in enhancing teaching and learning, especially in the context of higher education.

The theme for InCULT 2014 “Educate to Innovate in the 21st Century” was both timely and pertinent in today’s keenly competitive arena of globalized higher education environments. Theoretical and academic learning is closely interwoven with practice, research and innovation. Therefore, there is a need to engage and leverage the unique capabilities of both institutions of higher learning and industry, so as to ensure that innovations can be translated into practical realities necessary for the enhancement of teaching and learning. The following were the main sub-themes of the conference:

1. Experiences in education
2. Pedagogical innovations in education
3. Career development and training
4. Experiences in research
5. Technology in education
6. General issues in education

InCULT 2014 received a total of 145 abstract submissions, all of which were subjected to stringent “blind-reviews” and a total of 66 papers were finally selected for the Springer International Proceeding publication. Apart from local institutions, we also received paper submissions by international authors. Conference participants also came from varied backgrounds and institutions, both locally and abroad.

We would like to express our sincere gratitude to our collaborative partner institutions; University of Hertfordshire (UK), University of South Australia (UNISA), Ohio University (USA), Taylor’s University (M’sia) and the Higher Education

Leadership Academy of Malaysia (AKEPT) for their full support and cooperation in ensuring the success of this academic conference. Finally, our sincere thanks also go to all the authors, reviewers, speakers, participants and sponsors of the conference, and most importantly a “big” thank you also to all the extremely dedicated committee members of InCULT 2014 and not forgetting the Dean of the Faculty of Education, UiTM, Prof. Dr. Hj. Mohd. Mustafa Mohd Ghazali.

We hope you will enjoy reading the articles published in this issue. Thank you.

Chan Yuen Fook
Gurnam Kaur Sidhu
Suthagar Narasuman
Lee Lai Fong
Shireena Basree Abdul Rahman

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Paper Contributors (First Author Only)

1. Agatha Lamentan Muda
2. Ahmad Irfan bin Jailani
3. Aisyah Hani Mohd Habali
4. Anisah Abdul Rahman
5. Chan Yuen Fook
6. Cheong Tau Han
7. Emily Abd Rahman
8. Loo Ern Chen
9. Faizah A. Majid
10. Gurnam Kaur Sidhu
11. Harris Shah Abd Hamid
12. Hema Rosheny Mustafa
13. Jasmine Jain
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17. Leele Susana Jamian
18. Lim Peck Choo

19. Lim Soo Giap
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26. Mohd Nor Hajar Hasrol Jono
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28. Muhamad Furkan Mat Salleh
29. Muhamad Khalil Omar
30. Neo Mai
31. Nnaekwe Uchenna Kingsley
32. Nor Azian Abdul Rahman
33. Norashikin Hussein
34. Norhayati Baharun
35. Noridah Sain
36. Norshidah Nordin
37. Nur Fatima Wahida Mohd Nasir
38. Nur' Ain Ismail
39. Parmjit Singh
40. Persis Dineen Rodrigues
41. Raudzatul Fathiyah Mohd Said
42. Rosilawati Sueb
43. Roslaili Anuar
44. Roslinda Alias
45. Rosmila Abdul-Kahar
46. Rubiah Dalail
47. Siti Ruqayyah As-Sadiq Abdul Rahim
48. Saiful Izwan Zainal
49. Sariwati Mohd Shariff
50. Sarjit Kaur
51. Siti Fadhilah Abdul Hamid
52. Siti Hajar Aishah Mohd Azkah
53. Siti Zuraida Maaruf
54. Sofwah Md Nawî
55. Sujatha Krishnan
56. Suthagar Narasuman
57. Syamsul Nor Azlan Mohamad
58. Tang Howe Eng
59. Teoh Sian Hoon
60. Thuy Thi Bick Tran
61. Van Ngoc Sang
62. Wan Irma Sabrina Idris

63. Wong Ken Keong
64. Zawani Badri
65. Zuraidah Ali

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Chapter 1

An Analysis of the Effect of Demographic Factors on the Level of ICT Integration

Suthagar Narasuman

Abstract This study examines English Language lecturers' current level of ICT integration in TESL teacher training and the varying predictive effect of demographic factors such as age, teaching experience, gender and level of education on ICT integration. The study also sought to determine the extent to which the observed variability in ICT integration could be predicted by these factors. The theoretical framework for the study is drawn from a review of the literature on factors that enhance and impede ICT integration. The sample comprises 267 respondents working at the English Language Unit of various teacher training institutions. Survey questionnaires and interviews were used to collect data which was analysed using descriptive statistics, Spearman's rank order correlation, multiple regression, and reliability analysis. The finding of the study indicates that overall Faculty ICT Integration has a Mean of 2.61 and a Standard deviation of .537. This statistics indicate that ICT integration among the respondents in teaching English is average. The study also found age, gender and experience are not impounding factors as all three variables were found to be benign in its effect on ICT Integration in this study.

Keyword ICT integration

1.1 Introduction

The introduction of ICT technology in a large scale in the Malaysian education system started with the implementation of the Smart Schools programme, one of the seven key flagship ventures identified by the Multimedia Development Corporation. The main objective of the programme is to develop and introduce a new curriculum, in particular for the teaching of science, mathematics and English in selected schools

S. Narasuman (✉)

Faculty of Education, Asian Centre for Research on University Learning and Teaching,
Universiti Teknologi MARA, Campus Section 17,
40200 Shah Alam, Selangor, Malaysia
e-mail: suthagar@salam.uitm.edu.my

designated as Smart Schools. The aim of the new curriculum would be to stimulate creative and critical thinking skills couched in well-rounded values to be delivered in an IT rich learning environment. Inevitably, the implementation of these objectives called for changes in teacher training methods and classroom as well as school management practises. The various teacher training institutions in the country had since initiated technology units which conduct training programmes for both in service and pre-service teachers to teach in smart schools.

The next wave of digital education impacting indirectly on the teaching and learning of English followed soon when the government of the day, under the leadership of former Prime Minister Tun Dr. Mahathir, decided that science and mathematics would be taught in English in all primary and secondary schools in the country. This was known as the PPSMI programme. However, there was an outcry from teachers as many lacked the language proficiency needed to teach science and maths in English. In order to enhance the language proficiency of these teachers, the Ministry of Education launched the EteMS (English for Teaching Mathematics and Science) programme. Henceforth, the MOE, (Ministry of Education) proposed and was accepted, that EteMS and PPSMI would rely heavily on the use of information technology. Following the acceptance of the proposal by the MOE the government allocated a budget close to a billion ringgit which was promptly used to purchase and distribute a large sum of laptops, desktops, LCD projectors and screens, scanners, digital cameras and relevant software and programmes to schools and the teacher training institutions. In a statement in parliament, the former Deputy Education Minister, Datuk Razali reported that thus far the government had spent RM2.21 billion on ICT equipment and supplies and RM2.4 million ICT software for the programme (The Sun, 15 May, 2008, p. A2.). He also said that another RM317 million was spent on training pre-service and in-service teachers. The project also involved the training of personnel to handle the equipment and subsequently the retraining of thousands of teachers thought the country on the basics of handling the equipment as well as implementing them in the context of teaching and learning so that they could harness and yield these new technologies in their daily classroom instruction. This task was also entrusted to the various teacher training institutions in the country. Retraining of teachers particularly those who taught Science, Maths and English started in phases beginning in 2002 and continued up to the end of 2008. In the same year science and mathematics lessons for students in year one, form one and lower six were conducted in English. This exercise was a landmark in the development in ICT integration in the classroom as it increased professional development programmes, ICT proficiency and access to ICT infrastructure in teacher training institutions and schools. The ICT proficiency acquired by the respondents, ICT equipment and support service personnel employed under these programmes needs mention in the present study, as these components are important variables in the present study, on ICT integration.

1.1.1 Statement of the Problem

Several studies in schools and teacher training institutions in Malaysia (Nykqvist 2009) have highlighted that accessibility is no longer a problem for educators affiliated with the Education Ministry. The studies cited above, have all stated that teachers in schools and lecturers in teacher training institutions have some form of access to ICT. However, the availability of these facilities does not automatically guarantee that ICT would be integrated in teaching and learning and indeed these studies have highlighted the lack of ICT integration in the classroom. Samuel and Zaitun (2006) in particular have highlighted the lack of ICT integration in teaching English. A strong indicator of the lack of ICT integration as a problem that requires further study was provided by the Malaysian Education Blueprint 2013–2025 which states that the Ministry had spent more than RM6 billion on ICT over the past decade and yet close to 80 % of teachers spend less than an hour a week integrating ICT (Ministry of Education 2012). Because of the gaps identified in these studies and the preliminary report on the Malaysian Education Blueprint the present study, warrants the need for identifying the level of ICT integration in teaching English as a second language among English language lecturers' in Malaysian teacher training institutions. Identifying the level of integration and the effect of certain demographic factors is the first in the quest for enhancing ICT integration in the teaching of English in teacher training institutions.

1.1.2 Objectives of the Study

The main objective of the present study is to determine the level of ICT integration among English Language lecturers within the context of teaching English in teacher training institutions in Malaysia. The second objective is to determine the varying predictive effect of demographic factors such as age, teaching experience, gender and level of education among English Language lecturers on their current level of ICT integration.

1.1.3 Research Questions

The data collection process of this study was guided by the following research questions.

1. To what extent are English Language lecturers in teacher training institutions integrating ICT for instruction in the classroom?
2. Are the sub set of demographic factors, age, gender, level of education and teaching experience able to predict a significant amount of variance in ICT Integration among English Language lecturers?

1.2 Literature Review

1.2.1 *Instructional Views of ICT Integration*

Instructors in English Language programmes are familiar with terms such as methodology, technique and approach. These terms help to classify the overall idea and strategy in applying certain instructional principles. Similarly technology in instructional design had spawned its own range of terms in classifying the method, approach or technique to be used in instruction. Some of these terms are used interchangeably and are quite often a source of confusion (Picciano 2002).

Following are definitions of some of the basic terms used in instructional computing as defined by Picciano (2002, p. 27). The present research will also make use of these definitions. Computer-assisted Instruction (CAI) for instance is defined as the use of computers to assist in the instructional process. CAI is implemented in instruction using any or all of the following six modes; tutorial, drill and practice, instructional game, modelling, simulation and problem solving. Computer-Assisted Learning and Computer-Augmented Learning are often used synonymously with CAI. Computer-Based Education (CBE) is used as a generic term for the large assortment of instructional ICT applications available. Computer-based teaching (CBT) is used as a generic term to refer to the use of ICTs as part of instructional presentations in the classroom. An example is the use of interactive multimedia. Computer-Mediated Communications (CMC) is another popular application. It refers to the incorporation of communications software such as e-mail and electronic discussion boards in teaching. This is especially useful in distance education programs and in assigning holiday assignments as well as online discussions. Integrated Instructional System (IIS) and Integrated Learning System (ILS) are used synonymously to refer to a single ICT package comprising hardware, software, curriculum and management modules. It is often packaged and delivered by a single vendor. An example of this is the Smart School Management System (SSMS) developed by Telekom Smart School for use in Malaysian smart schools.

The management of information in an institution of higher education is of crucial importance. Teacher training institutions which run a multitude of in-service and pre-service programmes have to deal with the management of a monumental amount of information. These include student data, course outlines, teaching material and assessment scores. The advancement and incorporation of ICT in these institutions may help to make the task manageable. However, as Petrides et al. (2000, p. 118) point out, the use of technology to manage information in institutions of higher education may only be “deceivingly easier.” In reality it is a difficult task as the shift in utilising technology does not have as much to do with the actual use of the technology as it does with the shift in the norms and behaviour of the various components that make up the institution (Petrides et al. 2000). This change to a large extent is affected by the information culture practised by the institution which would determine how and to what extent information is valued, shared and capitalized by the various mechanisms within the institution.

With the advent in ICT innovation, teachers need to equip themselves with ICT knowledge and ICT literacy. This encompasses word processing, electronic presentation skills, accessing the internet, handling electronic media and using server technology. However, at the teacher training level it has been noted that many teacher trainees find it hard to cope with ICT skills and standards are still low (Teo 2008).

As future ESL teachers it is important that teacher trainees learn to integrate ICT into their future teaching and learning practises. Despite the increased availability of ICT implements and support services relatively few teachers are prepared to integrate ICT in their teaching. Sang et al. (2010) state multimedia has the capability to enhance teaching and learning but the mere addition of technology would not render a lesson effective. Technology is seen as a catalyst to conducting an effective lesson pedagogy and psychology are essential components of a successful lesson. Hence, ESL teachers in producing an effective lesson should be able to integrate all three components – pedagogy, psychology and technology.

Studies show that the level of ICT usage in teaching and learning and the level of ICT knowledge among teachers in Malaysia is low (Mahmud and Ismail 2010). These studies cited inadequate training, knowledge and skill as an important reason as to why teachers continue to use traditional methods and refuse to integrate ICT in their teaching. In a case study carried out in a Smart School, Mohd Arif and Norsiah (2003) found that in a 3 month period only 24.56 % of teachers had used the computer lab. They further state that only 40.53 % of teaching time was used to incorporate ICT in their teaching and most of these involve surfing the net to aid their lessons.

1.2.2 ICT Integration in the Teaching of English as a Second Language

ICT has the potential to improve the teaching and learning of ESL proficiency and methodology classes in Teacher Training Institutions. Researchers have highlighted that CALL for instance can be used to teach language skills such grammar, reading, writing, speaking, listening and literature (Shamsudin and Nesi 2006) Web 2.0 applications also has similar potential when it is integrated in proficiency and methodology classes. Shamsudin and Nesi (2006), found that the use of ICT enabled students to explore ESL websites, interact with students in the same field through synchronous and asynchronous communication. Using the internet students were able to conduct web conferencing which helped them to improve their speaking skills in an authentic situation. Engaging in blogging and social media websites helped them to improve their ESL writing skills beyond the classroom (Izaham 2009).

Mustafa (2001) conducted a study on the efficacy of using ICT on ESL students pronunciation and oral communication skills. The respondents in that study were students enrolled in an English language course at the University of Jordan. The study emphasized the effectiveness of using ICT in teaching most language skills

including oral communication. ICT provides the ESL instructor with a range of tools that can be used to make the teaching of English proficiency and methodology courses dynamic and interactive. It provides tools that enable students to interact with each and the instructor face to face in the classroom and online beyond the classroom. Guildbaud (2008) categorises ICT in language teaching as tools for information seeking, information presentation, knowledge organisation, knowledge integration and knowledge generation.

As a tool for seeking information, in ESL, ICT can be used to identify, locate and retrieve relevant information. In teaching and learning English literature for example, digital libraries can be sought and searched for particular text. Project Gutenberg for instance has a voluminous archive of online literary text that students and instructors can access as free e-books. Students working on their assignments could use keyword searches, websites, Wikipedia, digital libraries/database and online dictionaries to retrieve information on a wide range of topics and issues regarding the teaching of English as a second language.

As a presentation tool, ICT can be used to present relevant information in a variety of formats to enhance interpretation (Guilbaud 2008). Discussion boards, blogs, spreadsheets and Google docs/maps for instance can be utilised in the teaching of ESL skills and methods. Google docs/maps can be manipulated to teach directions in a proficiency class as well as in collaborative writing.

ICT as a tool for knowledge organization (Guildbaud 2008) can be applied in the ESL classroom as an implement for establishing conceptual relationships in the teaching and learning of grammar, critical reading, comprehension and TESL theories, methods and techniques. It can also be conceptualised as a tool for text and knowledge reconstruction as well as to manipulate information. Concept maps, PowerPoint, graphic organizers and smartboards are examples of ICT tools that can be used for ESL knowledge organisation. Hot Potatoes for instance is an application that can be used for text reconstruction and developing language games using cross-word puzzles.

ICT as a tool for knowledge integration in ESL teacher education can be used as a tool for connecting existing with new knowledge, test relationship between them and process the knowledge at a deeper level (Guildbaud 2008). In TESL teacher education programmes students are required to demonstrate the conceptual and theoretical knowledge and skills they have acquired. Recording a micro teaching session and commenting during playback is one way of demonstrating their knowledge. Producing interactive ESL teaching websites and blogs is also an effective method that combines both their knowledge of the subject matter and their knowledge of the principles involved in teaching the content.

ICT as a knowledge generation tool in TESL teacher education can be used to mirror knowledge generation processes, generate and manipulate new knowledge and represent new knowledge flexibly and meaningfully (Guildbaud 2008). This can be accomplished in a TESL classroom using applications such as iMovie or MovieMaker, Web page development, wikis and autoring tools. Various web 2.0 applications are also available online, which can be used by both TESL students and instructors to manipulate and present knowledge. Blendspace, for instance is a web

2.0 tool that combines video clips, pdf notes, graphics and quizzes constructed using Google docs.

In summary the discussion of the literature has established that ICT tools can be applied effectly in the teaching of English as a second language proficiency and teacher education methodology programmes (Izaham 2009). In ESL and TESL teacher education programmes, ICT can be utilised as tools for knowledge seeking activities, knowledge organization, knowledge integration and knowledge generation.

ICT integration in general involves the proficiency of educators in integrating a variety of applications such as word processing, desktop publishing, databases, spreadsheets and integrated programmes, multimedia, telecommunications and the internet. Wheeler and John (2008) discuss similar applications in teacher technology integration. However, they have added e-mail, mobile technologies and interactive white boards (IWB) to the list. They state that mobile technologies "...have a great potential to transform the experience of learning that can be conducted at any time and in any place." (p. 111). Wheeler and John (2008) also mention that hand held learning technologies have been successfully implemented by early adopters.

Izaham (2009) states that multimedia technology has enabled the use of a variety of media such as text, graphics, sound and animation to be used in the teaching and learning of English as a second language in teacher education. Izaham (2009) also believes that categorically there four advantages to integrating ICT in the teaching of English. Firstly combining listening with seeing through hyper media creates an authentic learning environment. Secondly, the use of ICT facilitates integrative presentation of all four language skills. Thirdly, the non-linear nature of hypermedia allows students to focus on both form and content simultaneously. Lastly, hypermedia provides an opportunity for students' to learn at their own pace. He also states, with the integration of ICT "the computer can act as a tutor to teach grammar, listening, pronunciation, reading, text construction, vocabulary, writing, and comprehensive skills" (p. 42).

In conceptualizing this variable the present study, had outlined the following applications in integrating ICT in the teaching of English as a second language in teacher training institutions. The sub headings provide an outline of the techniques required for integration of these applications. However, this outline is not exhaustive and forms a sample of the totality of techniques that could be employed in integrating ICT using these applications. Nevertheless, this outline conceptualises ICT integration in the context of the present study. Based on ISTE NETS standards for teacher ICT integration, the use of these applications in the class defines ICT integration. The outline also provides the framework for the survey questionnaire used in the present study, as an instrument to collect data on ICT integration among the respondents.

Outline of ICT applications and techniques for integration in ESL:

1. Word Processing in the ESL classroom
2. Text reconstruction software
3. Reference tools: electronic dictionaries and encyclopaedias

4. Moodle/course management system (cms)/learning management system (lms) for teaching and learning English
5. Social networking/blogs/wikis
6. Email
7. Mobile hand held devices
8. Administration and management/database/spreadsheet

1.2.3 Gender

Much of the literature on gender and ICT integration is based on an implied digital reticence among females and inequity of access. Nevertheless, a review of the literature returned contradictory evidence on ICT and integration by gender. Some studies indicate that males are more prone to technology adoption and integration. Whereas, other studies indicate females as having a better disposition to adopt technology (Kabachi et al. 2009).

The literature also revealed studies which could not find a significant difference in ICT integration between male and female faculty members (Agbatogun 2010). Liaw (2002) conducted a study on computer attitudes and web attitudes of doctoral students in a school of education. His findings indicated a significant difference between male students and female students in terms of their attitude towards computers and the internet.

Adams (2002) conducted a study on faculty members ICT integration and technology development programmes. Adams (2002) reports that female respondents were more eager to attend technology development programmes and they were also keener to integrate technology in teaching compared to male faculty members. Gender as a variable has the potential to influence ICT integration therefore, gender is a variable that needs to be considered in the present study. Gender could be a factor that influences English language lecturers' level of ICT integration.

1.2.4 Age and Experience

Teachers' age and experience is bound to have an effect on the level of ICT integration (Mahmud and Ismail 2010). Younger teachers' may be confident in using ICT due to their social exposure to ICT while for older teachers, confidence could be due to the knowledge of ICT that they have garnered over the years attending professional development activities. Nevertheless, there is not much evidence of either factor concerning lecturers teaching English in teacher training institutions in Malaysia.

The National Center for Education Statistics (2009) also reported similar findings whereby faculty members with less than 9 years of teaching experience were more prone to integrate ICT in their teaching. Another study where experience is a

variable was conducted by Adams (2002). In the study respondents were 589 faculty members in a metropolitan teaching institution. His study revealed that faculty members with less than 10 years of teaching experience were more likely to integrate computers and the internet in their teaching. The study also revealed female members with fewer years of teaching experience as the most active integrators of technology compared to their older male colleagues' who were the least prone to adopt technology. Venkatesh et al. (2003) also find report similar findings in their survey of ICT integration among faculty members. They find older users lagging behind their younger counterparts in technology uptake. They also find younger users placing more importance on the extrinsic rewards of technology uptake compared to older members of the faculty. Contrary to these findings, Teo (2008) states that he did not find any significant relationships between technology and age.

1.3 Research Design

Descriptive analysis was used to describe the demographic structure of the sample population. Multiple linear regression was used to analyse the degree of observed variance in the relationship between the demographic factors and ICT integration. Correlationship statistics were used to establish the significance in the relationship between the variables. In addition, interview data is collated and used to enhance the reliability of the quantitative findings. The evaluation design in the present study, is quantitative. Interview data is used to consolidate and verify the quantitative procedures. Filtering meaning from a variety of sources helps to confirm the validity and reliability of the investigation. The population for this study are English Language lecturers in Malaysian Teacher Training Institutions. Currently there are 27 such institutions located in the country. A total of 3,129 lecturers serve in these colleges. Out of these, about 400 serve as English Language lecturers. They conduct in-service as well as pre-service TESL teacher training courses. These courses include subjects such as literature, TESL methodology and social studies. The instruments selected to answer the research questions would be administered to a random sample of this population following conventions used for probability sampling.

1.3.1 Instrumentation

The study employs a cross-sectional design which means that the instrument i.e. the survey questionnaire would be administered once to a sample of the population which would yield data as they exist at the time of the administration of the survey. The researcher believes that a comprehensive investigation of current technological practices and its impact on ICT integration among English Language lecturers in Malaysian Teacher Training Institutions can be carried out by assessing and analysing the components of the proposed conceptual model. In other words, assessment

would be carried on the individual components that make up the model. In assessing these components the researcher had identified a number of tools which had been used and tested in similar studies. The design consists of a combination of survey questions and interviews constructed to glean information relevant in providing answers for the research questions. Specifically these questionnaires would involve the gathering of two categories of data:

English Language lecturers' demographics i.e. teaching load, years served as teacher/lecturer, years served in TTI, gender, age, professional qualification. Indicators for level of ICT integration for instructional purposes

1.4 Data Analysis

1.4.1 *To What Extent Are English Language Lecturers Integrating ICT for Instruction in the Classroom?*

Research question 1 seeks to find out the extent to which English language lecturers are integrating ICT for instruction in the classroom. Overall Faculty ICT Integration has a Mean of 2.61 and a Standard deviation of 0.537. This statistics indicate that ICT integration among the respondents in teaching English is average. These findings are an improvement in comparison to the findings of some studies (Mahmud and Ismail 2010) which have indicated that the level of ICT usage among teachers in Malaysia is quite low.

Nevertheless, the respondents in the present study, are lecturers in teacher training colleges and not school teachers. Therefore, there is a possibility that they would have more access to ICT equipment and training and this should rightfully engender a higher level of integration in teaching and learning. Further analysis in this chapter would reveal the predictors that affect the current level of ICT integration.

The data reveals that the respondent's frequency of ICT integration is focused more on administration and management ($M = 3.66$, $SD = .55$) rather than classroom integration. The use of ICT for teaching and learning is relatively low in comparison to their frequency of use for administration and management. The use of ICT for administration predominantly involves the use of software such MS word and MS Excel in preparing notes and exam questions. It also involves the use of exam management or course management software to upload marks to a centralised server. These activities are conducted out of the classroom and do not require direct student participation.

The present study, uses a questionnaire to explore respondents use of various software application in their ICT integration in the process of teaching and learning. ICT usage for instructional purposes can be accounted for by analysing data pertaining to the level of usage of instructional software and application software. Instructional software is defined as the use of educational software, software used for drill and practice activities and educational games. Application software is

defined as the typical use of processors, web browsers and presentation programs. In the present study, it is found that the use of this software for teaching and learning is still low. The highest frequency of integration was recorded for the use of reference tools, electronic dictionaries and encyclopaedias ($M=2.97$, $SD=1.11$). This is followed by the integration of word processing software ($M=2.85$, $SD=.78$). The mean for the rest of the software and applications are below 2.50. Nevertheless, this finding is in agreement with other studies. Slaouti and Barton (2007) for instance state that the most frequently used ICT component in teaching is word processing.

The least integrated component are Learning Management Systems ($M=1.93$, $SD=.52$) and Course Management Systems ($M=1.73$, $SD=.57$). The use of LMS and CMS as an integrated learning system allows ESL learners to access material in their own time. It also provides a central system for course instructors to upload teaching and learning content. A typical integrated system would consist of forums, discussion platforms, assignment management, course content and notes. Most university faculty in Malaysia are already utilising such systems. This can be verified from public university websites. One pertinent reason the respondents in the present study, have not made full use of such systems could be the non-availability of LMS and CMS in teacher training institutions. These findings are consistent with the findings of other studies on ICT integration. Based on a study done two teacher training institutions in Malaysia, Nykvist (2009) reported that internet connections were slow and unreliable. The study also noted that lecturers were not using learning management systems and the most frequently used programmes were word processing, presentation software and some word processing.

Nevertheless, based on literature review (Mahmud and Ismail 2010) ICT integration among teacher training institution lecturers is deemed slightly higher than that of school teachers. However, as was mentioned in the studies quoted above, the respondents in the present study, also have a positive attitude towards ICT but lack the necessary skills to further integrate ICT to a higher level. The interview data had revealed many shortcomings in the infrastructural and the provision of access to ICT which could have a negative effect on the respondents ICT integration. As was mentioned in the previous studies mentioned above, these Malaysian educators are still facing the challenge of poor infrastructural facilities, access to equipment and professional development programmes.

1.4.1.1 Variance in ICT Integration According to Demographic Factors

The current section will provide the analysis of variance for the respondents ICT integration according to the demographic factors of age, gender, level of education and teaching experience. Multiple regression statistics was employed in assessing the variance. Table 1.1 provides a summary of the hierarchical regression modal.

Hierarchical multiple regression was used to assess the ability of the three control measures, gender, level of education and teaching experience after controlling for the influence of age to predict Faculty ICT Integration. Age was entered at Step 1, explaining 0 % of the variance in ICT Integration. Therefore in the present study,

Table 1.1 Hierarchical regression modal summary

Model	R	R square	Adjusted R square	Std. error of the estimate	Change statistics				
					R square change	F change	df1	df2	Sig. F change
1	.061**	.004	.000	.53715	.004	1.014	1	274	.315
2	.101**	.010	-.004	.53834	.007	.598	3	271	.617

**Correlation is significant at the 0.01 level (1-tailed).

age is not a predictor of Faculty ICT Integration. There was not much difference in the variance after entry of the sub-set of demographic factors, gender, level of education and teaching experience. At Step 2 the total variance explained by the modal as a whole was only 1 %, $F(4, 271) = .701, p < .001$. The three control measures were only able to explain 1 % of the variance in Faculty ICT Integration after controlling for age, R squared change = .01, F change (3, 271) = .598, $p < .001$. In the final modal none of the demographic factors were found to be statistically significant.

1.4.2 Are the Sub Set of Demographic Factors, Age, Gender, Level of Education and Teaching Experience Able to Predict a Significant Amount of Variance in Faculty ICT Integration?

Research question 2 seeks to find out if the sub set of demographic factors, age, gender, level of education and teaching experience are able to predict a significant amount of variance in faculty ICT integration. The current section will provide the analysis of variance for the respondents ICT integration according to the demographic factors of age, gender, level of education and teaching experience. Multiple regression statistics was employed in assessing the variance.

The study was conducted with the involvement of 276 respondents. Ninety one percent of the respondents were between the ages 35 and 54. A larger proportion of the respondents were females (68.5 %). However, age and gender is not an impounding factor as both variables were found to be benign in its effect on ICT Integration In this study. These findings are in keeping with the findings of other studies (Agbatogun 2010) which found no significant difference in ICT integration levels between male and female respondents. The findings of the present study, and those that are mentioned above could mean that the information gap between age, gender and ICT integration is in regression in the teaching profession and among teacher educators in particular. One reason for these could be the common background that they share in terms experience as former school teachers, amount of exposure to professional development programmes where there is no age or gender discrimination in the selection of participants. As former school teachers they may be used to traditional pedagogic techniques employed as school teachers where the integration

of ICT is often quoted to be low (Nykqvist 2009). Upon starting work at the teacher training institutions, these former teachers are not placed in probation and they do not have to serve as assistant lecturers where they could learn from senior lecturers. Quite often the Ministry of the institution concerned does not conduct comprehensive induction programmes where ICT integration is a component. Therefore, they continue with old habits, banking on traditional pedagogy, regardless of age, gender or experience. Another factor is the intersection of other variables within the study which exert a stronger influence on ICT integration other than age and gender. Factors such as access, ICT proficiency and attitude may have a stronger effect on ICT integration.

In terms of experience a large majority had worked as school teachers before joining the teacher training institution. This is quite the norm as the Teacher Education Division at the Ministry of Education often conducts recruiting exercises among school teachers to fill the post of lecturers at Teacher Training Institutions. Therefore, the respondents in this study, are experienced both as lecturers and school teachers and this experience would provide an impact on their procedural and declarative knowledge of their subject matter and the requisite pedagogical knowledge needed for classroom teaching. The long years of service would have also provided them with opportunities to attend professional development programs in their content area, pedagogy and ICT. As for the respondents who have been integrating ICT in their lessons, the long years of service would have accorded them with time and opportunity to hone their skills in integrating ICT with content and pedagogy. However, despite the opportunity of time, experience like gender and age does not show a significant effect on ICT integration in the present study. A pertinent reason for this could be the lack of professional development programs over the years both in school; their former workplace and at the Teacher Training Institutions. With the years of service also comes old habits and entrenched comfort zones which are hard to change. These could be the factors that render age, gender and experience as insignificant predictors of ICT integration in the present study.

1.5 Conclusion

1.5.1 Pedagogical Implications

The first specific objective of the study was to determine the respondents' current level of ICT integration within the context of teaching English in teacher training institutions in Malaysia. With regards to this objective the findings indicate that ICT Integration among the respondents is statistically significant at an average level of integration. Nevertheless, this finding indicates that there is an overall improvement in ICT Integration in comparison to the findings of other studies among Malaysian teachers and teacher educators.

This improvement in the right direction is an indication that the ICT policies of the Teacher Education Division at the Ministry of Education are successful. However, ICT administrators and policy makers should also take note of the components factors that constitute ICT Integration among the respondents. The findings had revealed that the respondents' frequency of integration is skewed towards ICT Integration in administration and management of courses, students and data. Pedagogic integration seems to brush the surface and lacks depth. Quite often ICT is used in preparing course content but is not used in the classroom extensively. The highest frequency of integration in the classroom was noted for the integration of reference tools, electronic dictionaries and encyclopaedias. In second place are word processing software. Faculty members who are able to integrate ICT in administration, management and the development of course content and course materials are already comfortable with the use of computers and certain programmes. Policy makers and administrators should find ways to help them to bring their skills a step further into the classroom. One way of doing this is to conduct more hands-on professional development programmes.

The least integrated aspects were Learning Management Systems, Content and Course Management Systems. These components are known for their versatility and usefulness in managing learning. They are also widely used in among Education Faculties in universities in the country. The reason cited for the poor integration of these components as discussed in the findings is simply the lack of such facilities at the various teacher training institutions. It is incumbent upon the administrators and policy makers to ensure that the right facilities are made available for faculty members in order to propel ICT Integration to the next level.

1.5.2 Predictive Effect of Demographic Variables

The second specific objective of the present study is to determine the varying predictive effect of demographic factors such as age, teaching experience, gender and level of education on the respondents' current level of ICT integration. While a number of different studies have noted that gender, age, experience and educational levels have a significant effect on ICT Integration; the present study differs in its data analysis which could not identify any significant effect from these variables on ICT Integration. Therefore, these variables are not predictors of ICT Integration in the context of TESL teacher training.

References

- Adams, N. B. (2002). Educational computing concerns of postsecondary faculty. *Journal of Research on Technology in Education*, 34(3), 285–303.
- Agbatogun, A. O. (2010). Gender, academic qualification and subject discipline differentials of Nigerian teachers' ICT literacy. *Academic Leadership, The Online Journal*, 8(1). Retrieved December 30, 2000, from <http://www.academicleadership.org/article>

- Guilbault, P. (2008). *Learning, instruction, & ESL training*. Office of International Research, Education & Development (OIREd). Retrieved September 29, 2014, from <http://www.ict.oiired.vt.edu/haiti/doc/Publications/Guilbault%20Learn%20and%20Instruct.pdf>
- Izaham, S. I. (2009). Factors hindering the integration of CALL in a tertiary institution. *Asian Journal of University Education*, 4(2), 35–60.
- Kabakci, I., Akbulut, Y., & Ozogul, P. (2009). Perceived problems of computer teachers. *Eurasian Journal of Educational Research*, 34, 199–214.
- Liaw, S. S. (2002). An Internet survey for perceptions of computers and the World Wide Web: Relationship, prediction, and difference. *Computers in Human Behavior*, 18, 17–35.
- Mahmud, R., & Ismail, M. A. (2010). Impact of training and experience in using ICT on in-service teachers' basic ICT literacy. *Malaysian Journal of Educational Technology*, 10(2), 5–10.
- Ministry of Education. (2012). *Preliminary report-executive summary*. Malaysian Education Blueprint 2013–2015.
- Mohd Arif, I., & Norsiah. (2003). ICT in schools: Issues and challenges. *Proceeding – ICT Seminar* (16), 1–18.
- Mustafa, Z. (2001, May). *Non-course ware factors involved in using multimedia in foreign language instruction*. Paper presented at the annual meeting of the Canadian association of applied linguistics, Laval, Quebec, Canada.
- National Center for Education Statistics. (2009). *Digest of education statistics*. Washington, DC. Author retrieved July 21, 2010, from <http://nces.ed.gov/pubsearch/pubsinfo.asp>
- Nykvist, S. S. (2009, July 27–31). *A Malaysian tale: Pre-service teacher education and ICT integration for a better world*. Proceedings of the 9th IFIP world conference for computers in education, Bento Goncalves, Brazil.
- Petrides, L., Sharon, K. D., & Pablo, R. (2000). The politics of information management. In L. A. Petrides (Ed.), *Case studies on information technology in higher education: Implications for policy and practise* (pp. 118–127). Hershey: Idea Group Publishing.
- Picciano, A. G. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, 6(1), 21–40.
- Samuel, R. J., & Zaitun, A. B. (2006). The utilization and integration of ICT tools in promoting English language teaching and learning: Reflections from English option teachers in Kuala Langat district, Malaysia. *International Journal of Education and Development using Information and Communication Technology*, 2(2), 414.
- Sang, G., Martin, V., Johan, V. B., & Jo, T. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviours with educational technology. *Computers & Education*, 54(1): 103–112. doi:10.1016/j.compedu.2009.07.010
- Shamsudin, S., & Nesi, H. (2006). Computer mediated communication in English for specific purposes. A case study with computer science students at UniversitiTeknologi Malaysia. *Computer Assisted Language Learning*, 19(4/5), 317–339.
- Slaouti, D., & Barton, A. (2007). Opportunities for practice and development: Newly qualified teachers and the use of information and communication technologies in teaching foreign languages in English secondary school contexts. *Journal of In-service Education*, 33(4), 19.
- Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, 24(4), 413–424.
- The Sun. (2008, May 15). Other languages will not be sidelined. *The Sun*, p. 8.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478.
- Wheeler, S., & John, P. D. (2008). *The digital classroom, harnessing technology for the future*. New York: Routledge.

Chapter 2

The Relationship Between Learning Culture and High Performance and Productivity Culture with Job Satisfaction: A Study Among Employees in One Public Organization in Sarawak, Malaysia

Agatha Lamentan Muda, Chan Yuen Fook, and Norsidah Mohd Noordin

Abstract Numerous of studies have indicated significant relationship between organizational culture with job satisfaction. This study is specifically examined the relationship between two dimensions of organizational culture which comprises of “learning culture” and “high performance and productivity culture” with job satisfaction. The respondents of study consisted of 60 employees from a public organization in the district of Sri Aman, Sarawak, Malaysia. The selection of sample was done through a simple random sampling, and a cross-sectional survey questionnaire was used as a mean of data collection. Data was analysed using the Statistical Package for the Social Sciences (SPSS) Version 11. Pearson Product-Moment correlation and the Stepwise regression analysis were used to analyse the relationship between variables under the study. The results of the Pearson Product-Moment correlation indicated that there were significant and positive relationships between both dimensions of organizational culture with the job satisfaction. The strongest relationship was between the “learning culture” and job satisfaction. The findings indicated that the “learning culture” and “high performance and productivity culture” help to generate and promote high level of employees’ job satisfaction. This study provided compelling evidences on the importance of organization’s continuing efforts to understand the relationship between organizational culture and job satisfaction.

Keywords Job satisfaction • Organizational culture

A.L. Muda (✉) • C.Y. Fook • N.M. Noordin
Faculty of Education, Universiti Teknologi MARA (UiTM),
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: malamentan@fcs.unimas.my; yuenfook@salam.uitm.edu.my;
norsh785@salam.uitm.edu.my

2.1 Introduction

Extensive studies have been conducted on the subject of *job satisfaction* over the last four decades of organizational research (Currivan 1999). For example, several studies have attempted to examine the association between *job satisfaction* with organizational commitment (Currivan 1999), cohesions (Odom et al. 1990) and management practices (Burke 1995). Although many research have been done to study the relationship between *job satisfaction* with numerous organizational variables (Lund 2003), however less study has investigated the relationship between *job satisfaction* with *organizational cultures* (Lund 2003). Nevertheless, the interconnection between *organizational cultures* with *job satisfaction* have been indicated in few earlier studies like Quinn (1988), Odom et al. (1990), Cameron (1992) and Sheridan (1992). Despite these few studies, a void appears to exist in the literature examining the direct relationship between *organizational cultures* types and *job satisfaction* (Lund 2003). In relation to the previous mentioned past research, thus this study sought to examine the relationship between two dimensions of *organizational culture* that was the *learning culture* and *high performance and productivity culture* with *job satisfaction* in one public organization in Sri Aman, Sarawak, Malaysia.

Specifically, there were six research objectives of this study:

1. To identify the level of *learning culture* practice.
2. To identify the level of *high performance and productivity culture* practice.
3. To identify the level of *job satisfaction*.
4. To identify the relationship between *learning culture* with *job satisfaction*.
5. To identify the relationship between *high performance and productivity culture* with *job satisfaction*.
6. To identify the most dominant dimension of *organizational culture* (between *learning culture* and *high performance and productivity culture*) affecting *job satisfaction*.

As it was stated by authors like Deal and Kennedy (1982) and Peters and Waterman (1982), adopting a certain common cultural traits would result in excellent performance. In relation to this, a study by Pool (2000a) has indicated a strong correlated relationship between a supportive culture with a level of learning in an organization. According to Pool (2000a) the essential attributes of a supportive culture are open communication, trust, innovation, providing challenging work and cohesion among employees. In relation to Pool (2000a), it was indicated by Quinn (1988), Odom et al. (1990), Cameron (1992) and Sheridan (1992) that the *organizational culture* in which characterized as people-oriented, supportive and personal was associated with positive affective outcomes including *job satisfaction* and organizational commitment. In addition, a study by Chang and Lee (2007) in their attempt to make business organizations aware of the effect of organization learning activities in Taiwan, has showed that the operation of learning organizations has a significantly positive effect on employees' *job satisfaction*.

Furthermore Pool (2000b) has revealed that a constructive culture was significantly reducing the role stressor and thereby decreasing job tension and increasing *job satisfaction*, job performance and job commitment. As indicated by Pool (2000b) a constructive culture is characterized as a culture that recognize employee's achievement, expect the managerial staffs to set challenging yet realistic goals and establish plan to achieve these goals, encourage creativity that support quality over quantity of work, and anticipate the managerial staffs to deal with associates in a friendly manner and help each other to grow and develop.

The two dimensions of *organizational culture* in this study, that was the *learning culture* and *high performance and productivity culture* has the characteristics of the supportive culture and constructive culture respectively, that were previously mentioned by Pool (2000a, b). In this study, the independent variables were the *learning culture* and *high performance and productivity culture*, and the dependent variable was the *job satisfaction*.

Consequently in addition to the research objectives, the study also tested two research hypotheses that were formulated based on previous related studies. In this study, the independent variables were the *learning culture* and *high performance and productivity culture*, and the dependent variable was the *job satisfaction*.

Hypothesis 1: There is a significant relationship between *learning culture* with *job satisfaction*.

Hypothesis 2: There is a significant relationship between *high performance and productivity culture* with *job satisfaction*.

2.2 Method

A survey research was conducted in an attempt to examine the relationship between *learning culture* and *high performance and productivity culture* with *job satisfaction*. For hypotheses testing, a correlational approach was used to determine the relationship exists between variables of the study. The population of this study were employees from one public organization in the district of Sri Aman, Sarawak, Malaysia, and a simple random sampling technique was used to gather data from employees in the organization. At the time of study, approximately 100 employees were eligible and the required sample size was 40 (Luck et al. 1987). However a total of 90 questionnaires were distributed and 63 were returned back. Nevertheless only 60 questionnaires were usable for the final analysis. A cross-sectional survey questionnaire was designed to collect data for the study. The questionnaire had three sections. Section one was on respondent's background. Section two was on organizational culture that covers both *learning culture* and *high performance and productivity culture* and developed based on McGill and Slocum (1993), Watkins and Marsick (1993), Pool (2000a, b) and Robbins and Coulter (2005), and Section three was on *job satisfaction* adapted from Smith et al. (1969). All items used in the questionnaires were closed ended, in both English and Malay language and

measured using the five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5). A pilot test was done prior to the actual study to determine the reliability and validity of the research instrument.

2.3 Results

This section show the findings of this study in relation to the research objectives and hypotheses. Specifically, findings are discussed in the form of descriptive and inferential statistics.

2.3.1 Demographic Characteristics

Table 2.1 indicated the sample profile of the study. Majority of the respondents were male (70 %), in the group of age between 42 and 49 years old (38.3 %), Ibans (55 %), possessing the Lower Secondary Assessment and Malaysian Certificate of Education (80 %), and married (83.3 %).

2.3.2 Level of Perceived Learning Culture Practice

Table 2.2 showed that most of the respondents perceived that the *learning culture* was well practiced in their organization (46.7 %). Meanwhile, 25 % of respondents perceived that the *learning culture* was moderately and highly practiced in their organization, respectively. Nevertheless, interestingly there were few respondents (3.3 %) believed that the *learning culture* was less practiced in their organization. As a whole results indicated that most of respondents believed that the *learning culture* was practices at a good level in their organization.

Table 2.1 Demographic characteristics

Gender (%)	Age (%)	Race (%)	Education level (%)	Marital status (%)
Male=70	18–25=11.7	Malay = 16.7	Completed primary school=8.3	Single = 15
Female=30	26–33 = 10	Chinese=26.7	Lower Secondary Assessment/Malaysian Certificate of Education=80	Married=83.3
	34–41 = 15	Iban = 55	Malaysian Higher School Certificate=3.3	Divorcee/ Widower = 1.7
	42–49=38.3 50 and above=25	Others = 1.7	Diploma/Bachelor’s degree = 8.3	

Table 2.2 Level of perceived *learning culture* practice

Min scores	Classification	Frequency (N=60)	Percentage (%)
1.8 and below	Not practiced	0	0
1.9–2.7	Less practiced	2	3.3
2.8–3.6	Moderately practiced	15	25
3.7–4.5	Well practiced	28	46.7
4.6 and above	Highly practiced	15	25
Total		60	100
Min: 3.84		Median: 4	Mod: 4

Table 2.3 Level of perceived *high performance and productivity culture* practice

Min scores	Classification	Frequency (N=60)	Percentage (%)
1.8 and below	Not practiced	0	0
1.9–2.7	Less practiced	0	0
2.8–3.6	Moderately practiced	7	11.7
3.7–4.5	Well practiced	23	38.3
4.6 and above	Highly practiced	30	50
Total		60	100
Min: 4.08		Median: 4.13	Mod: 4.25

2.3.3 Level of Perceived High Performance and Productivity Culture Practice

Results showed in Table 2.3 indicated that half of the respondents (50 %) perceived that the *high performance and productivity culture* was highly practiced in their organization. While 38.3 % of the respondents recognized that this culture was well practiced in their organization, the remaining of 11.7 % felt that the *high performance and productivity culture* was moderately practiced. In general the findings indicated that all respondents perceived that the *high performance and productivity culture* was practices thoroughly in their organization. This practice benefited their respective organization in terms of delivering the high quality services that will satisfy their customers.

2.3.4 Job Satisfaction Level

As indicated in Table 2.4, more than a half of the respondents were satisfied with their job (63.3 %). While 31.7 % were moderately satisfied and 1.7 % were very satisfied, interestingly there were few respondents who were unsatisfied with their job (3.3 %). In overall, the results implied that majority of the respondents perceived

Table 2.4 *Job satisfaction level*

Min scores	Classification	Frequency (N=60)	Percentage (%)
1.8 and below	Very unsatisfied	0	0
1.9–2.7	Unsatisfied	2	3.3
2.8–3.6	Moderately satisfied	19	31.7
3.7–4.5	Satisfied	38	63.3
4.6 and above	Very satisfied	1	1.7
Total		60	100
Min: 3.84		Median: 3.9	Mod: 4.3

Table 2.5 The relationship between *learning culture* with *job satisfaction*

		Learning culture	Job satisfaction
Learning culture	Pearson correlation	1	0.812**
	Sig. (2-tailed)		0.000
	N	60	60
Job satisfaction	Pearson correlation	0.812**	1
	Sig. (2-tailed)	0.000	
	N	60	60

**Correlation is significant at the 0.01 level (1-tailed).

that they were satisfied with their job, which is, in terms of the job facet, salary, job promotion opportunity, boss and colleague.

2.3.5 *The Relationship Between Learning Culture with Job Satisfaction*

The result of the Pearson Product-Moment Correlation analysis indicated in Table 2.5 portrayed a significantly positive relationship between *learning culture* with *job satisfaction* ($r=0.812$, $p\text{-value}=0.000$). Therefore, the first hypothesis of this study which indicated that there is a significant relationship between *learning culture* with *job satisfaction* was accepted. This finding is consistent with the past study by Chang and Lee (2007).

2.3.6 *The Relationship Between High Performance and Productivity Culture with Job Satisfaction*

As indicated in Table 2.6, the Pearson Product-Moment Correlation analysis’s result proven a significantly positive relationship between *high performance and productivity culture* with *job satisfaction* ($r=0.752$, $p\text{-value}=0.000$). Accordingly the

Table 2.6 The relationship between *high performance and productivity culture* with job satisfaction

		High performance and productivity culture	Job satisfaction
High performance and productivity culture	Pearson correlation	1	0.752**
	Sig. (2-tailed)		.000
	N	60	60
Job satisfaction	Pearson correlation	0.752**	1
	Sig. (2-tailed)	.000	
	N	60	60

**Correlation is significant at the 0.01 level (1-tailed).

Table 2.7 Most dominant type of *organizational culture* affecting *job satisfaction*

Variables	Beta value	T	Level of significant
Learning culture with job satisfaction	0.568	5.132	0.000
High performance and productivity culture with job satisfaction	0.322	2.914	0.005

second hypothesis of this study which indicated that there is a significant relationship *high performance and productivity culture* with *job satisfaction* was accepted. This finding supported past study by Pool (2000b).

2.3.7 Most Dominant Dimension of Organizational Culture Affecting Job Satisfaction

Table 2.7 indicated the results of the Stepwise Regression analysis. The results revealed that the *learning culture* was the most dominant dimension of *organizational culture* affecting the *job satisfaction* with the beta value of 0.568. Consequently the findings implied that the *learning culture* influences the *job satisfaction* greater as compare to the *high performance and productivity culture*.

2.4 Discussion and Conclusion

This study has proven that exists a significantly positive relationship between *organizational culture* with employee’s *job satisfaction*. Therefore the two hypotheses of this study were accepted. Specifically this study has evidenced that the *learning culture* and *high performance and productivity culture* were significant and positively related to *job satisfaction*. Thus the findings of this study supported the past research by Quinn (1988), Odom et al. (1990), Cameron (1992), Sheridan

(1992) and Pool (2000a, b). These past studies have evidenced that the organizational culture which characterized as supportive and constructive, high in cohesiveness and creativity, and emphasizing on developing human resources and innovation were significant and positively related to job satisfaction and commitment. Furthermore the results of this study were also shown that the *learning culture* had the highest relationship with the *job satisfaction* and was also the most dominant dimension of *organizational culture* affecting the *job satisfaction*. Hence the findings were consistent with a study done by Chang and Lee (2007) that indicated the operation of learning organizations has a significantly positive effect on employees' job satisfaction.

The results drawn from this study were considering the following limitations. The researchers recognized that there are others potential factors that may influence the *job satisfaction* like job characteristics and personal characteristics. However, this study did not consider any other variables that may moderate or mediate the relationship between the *learning culture* and the *high performance and productivity culture* with the *job satisfaction*. Consequently, future researchers are encouraged to complement the previous studies or to extend this research further by considering the others factor that might related to the variables in the study. In addition, the data used in this study were derived from a simple random sample of a single public organization which obtained from a survey questionnaire. These limitations decreased the ability of the researchers to generalize the findings to others organization setting. For this reason future studies are encouraged to conduct their studies across a broader cross-section of organizations in Malaysia to enable the generalization of findings. Furthermore a qualitative method such as the use of interviews can also be considered as an additional method of data gathering to further explain the relationship between the *organizational culture* with *job satisfaction*.

Practically, the results of this study might be used as guidelines by the organizations' management to strengthen the existing *organizational culture* practices in their respective organizations. This objective may possibly be achieved by considering the following recommendations. Firstly, the organizations are encouraged to put emphasis on the learning activities like training and development where employees are continuously trained with updated knowledge and important skills. Secondly, the organization should recognizing their employees' achievements and motivating them to establish their own career goals. Thirdly, encouraging employees' creativity and stressing the quality of employees' work over the quantity of their work. Finally, the organizations should anticipating their employees to help each other to grow and develop. These recommendations might positively driven employees to perceive that their contributions are appreciated and therefore will help to elevate their *job satisfaction's* level.

In conclusion, the empirical findings derived from this study provided a greater insight as to what extent that the employee's *job satisfaction* was related to and affected by the *organizational culture* particularly in the local context of Malaysia. The findings of this study supported and extended the previous studies on *organizational culture* and *job satisfaction* that were mainly published in the Western organizational settings. For this reason, current research and practices

should consider that the *organizational culture*, specifically the *learning culture* and the *high performance and productivity culture* as important variables that are related to and influenced employee's *job satisfaction*. A greater understanding on the relationship between organizational culture and employee's job satisfaction can helps organizations to plan and decide on effective ways to elevate their employee's job satisfaction by adopting an excellent organizational culture practice.

References

- Burke, R. J. (1995). Management practices, employees' satisfaction and perceptions of quality of service. *Psychological Reports*, 77, 748–750.
- Cameron, K. (1992). Organizational downsizing. *Organizational change and redesign*. New York: Oxford University Press.
- Chang, S. C., & Lee, M. S. (2007). A study on relationship among leadership, organizational culture, the operation of learning organization and employees' job satisfaction. *The Learning Organization*, 14(2), 155–185.
- Curry, D. B. (1999). The causal order of job satisfaction and organizational commitment in models of employee turnover. *Human Resource Management Review*, 9, 495–524.
- Deal, T. E., & Kennedy, A. A. (1982). *Corporate cultures: The rights and rituals of corporate life*. Reading: Addison-Wesley.
- Luck, D. J., Taylor, W. G., & Robin. (1987). *Marketing research*. Englewood Cliffs: Prentice Hall.
- Lund, D. B. (2003). Organizational culture and job satisfaction. *Journal of Business and Industrial Marketing*, 18(3), 219–236.
- McGill, M. E., & Slocum, J. W., Jr. (1993). Unlearning organization. *Organizational Dynamics*, 22(2), 67–79.
- Odom, R. Y., Boxx, W. R., & Dunn, M. G. (1990). Organizational cultures, commitment, satisfaction, and cohesion. *Public Productivity and Management Review*, 14(2), 157–169.
- Peters, T. J., & Waterman, R. H. (1982). *In search of excellence: Lessons from America's best-run companies*. New York: Harper & Row.
- Pool, S. W. (2000a). The learning organization: Motivating employees by integrating TQM philosophy in a supportive organizational culture. *Leadership and Organization Development Journal*, 21(8), 373–378.
- Pool, S. W. (2000b). Organizational culture and its relationship between job tension in measuring outcome among business executives. *Journal of Management Development*, 19(1), 32–49.
- Quinn, R. E. (1988). *Beyond rational management: Mastering the paradoxes and competing demands of high performance*. San Francisco: Jossey-Bass.
- Robbins, S. P., & Coulter, M. (2005). *Management* (8th ed.). Englewood Cliffs: Prentice Hall.
- Sheridan, J. E. (1992). Organizational culture and employee retention. *Academy of Management Journal*, 35, 1036–1056.
- Smith, P. C., Kendall, L. M., & Hulin, C. L. (1969). *The measurement of satisfaction in work and retirement*. Chicago: Rand-McNally.
- Watkins, K. E., & Marsick, V. J. (1993). *Sculpting the learning organization: Lessons in the art and science of systematic change*. San Francisco: Jossey-Bass.

Chapter 3

e-INTEGRAL MAP: An Innovative Integral Calculus Learning

Tang Howe Eng, Nor Hazizah Julaihi, and Voon Li Li

Abstract This study has proposed e-INTEGRAL MAP as an innovative learning tool through the application of mapping techniques, which provides an alternative way for learners to learn integral calculus. This study aims to report the features, significances of e-INTEGRAL MAP and students' opinion on the use of e-INTEGRAL MAP. The review of literature indicates that university students encountered difficulties in identifying the correct integration techniques and developing understanding on applications of the integral calculus. In view of this phenomenon, e-INTEGRAL MAP are developed to help and enhance better memory so as to reproduce information with the use of mapping techniques as these techniques use both sides of the brain. Through e-INTEGRAL MAP, these students are able to identify the most suitable map for the relevant integration techniques hence help to disseminate the bridging conceptual knowledge of the procedural learning. The critically constructed concepts and meaningful relationships between ideas allowed students to choose and explore the various integration techniques, and worked out the integral calculus solution systematically. e-INTEGRAL MAP assists the student to know the purpose, condition, process and examples of each of the integration techniques. The results from the analysis of questionnaire indicated that 52.8 % of the respondents would highly recommend e-INTEGRAL MAP. The samples of engineering programmes from the public university provided positive feedback on their usage of e-INTEGRAL MAP. This study serves as inputs for future studies in developing useful learning aid and evaluating the product for better improvement.

T. Howe Eng (✉)

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA,
Mukah Campus, 96400 Mukah, Sarawak, Malaysia

e-mail: lily@sarawak.uitm.edu.my

N.H. Julaihi

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA,
Samarahan I Campus, 94300 Kota Samarahan, Sarawak, Malaysia

e-mail: norhazizah@sarawak.uitm.edu.my

L.L. Voon

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA,
Samarahan II Campus, 94300 Kota Samarahan, Sarawak, Malaysia

e-mail: llvoon@sarawak.uitm.edu.my

Keywords Features • Innovative • Integral calculus • Mapping technique • Significances

3.1 Introduction

There are many innovations in the learning of mathematics. Several recent examples range from the use of instructional activities game in learning mathematics, ICT (information and communications technologies)-based mathematics learning and the use of mapping techniques or ICT-based concept mapping in learning mathematics.

Integral calculus has always been an issue in learning mathematics. According to Tang et al. (2008), this issue started with the identification of the correct integration techniques out of the many different techniques. Traditional manner do not help students develop their problem formulation ability, problem solving skills, deepen their understanding of integration, or enrich their appreciation of the diverse applications of integral calculus (Allen 2001). This phenomenon has caused much difficulties among university students in identifying the correct integration techniques and developing understanding on applications of the integral calculus. Today, industries and businesses demand for the application of calculus as a powerful tool to understand, analyze, apply and solve a wide range of problems. Thus, a good mastery in integral calculus is deemed necessary for university students.

This study has proposed e-INTEGRAL MAP, a tool created by the researchers, as an innovative learning tool through the application of mapping techniques, which provides an alternative way for learners to learn the integral calculus. The mapping techniques are used because of their visualization effects and the benefits of inter-knowledge correlation through procedural learning. The mapping techniques provide a rich learning experience for different abilities of students in a simple and systematic manner. This study aims to explore the features and significances of e-INTEGRAL MAP. This study also seeks to investigate students' opinion on the use of e-INTEGRAL MAP in the learning of integral calculus.

3.2 Literature Review

3.2.1 *Innovative Teaching and Learning*

NIER (National Institute of Educational Research 2004) survey reported that the most common attitude of Japanese high school students to mathematics is that mathematics is not useful in daily life but must be learnt for entrance examinations. This survey signals the urgent need of improving students' ability to solve daily life problems using ICT in conjunction with mathematical thinking processes.

Tonkes et al. (2005) revealed a learning model that has worked well in practice, from the lecturers', tutors' and students' perspectives with regard to the usage of MATLAB across first year mathematics courses. MATLAB is a sophisticated software tool for numerical analysis and visualization. After great effort in tuning, a sequence of innovations finally captured student support and added considerable value to both the computational and traditional learning process. The learning model employed a progression of MATLAB commands, programs and Graphical User Interfaces (GUIs) to deliver programming skills, numerical mathematics knowledge, computational science exposure and illustrations to provide a better understanding of calculus, linear algebra and differential equations.

3.2.2 Mapping Techniques in Learning

The mind mapping technique was developed by Tony Buzan with the aim to activate both hemispheres of the human brain. Buzan and Buzan (1996) reported that mind map is a powerful graphic technique that aims to use the brain with full capacity, organize an individual's thoughts and other information. Mind mapping enables human to group the concepts, re-group and compare the concepts. The grouping and re-grouping of the concepts and also synthesizing them together in new clusters help to reveal new ideas.

Buzan (1990) explained that in order to create a mind map, one begins by writing the main topic in the middle of a blank piece of paper. Sub-topics are then "mapped" around the main topic. The sheet of paper begins to look like a set of branches as all ideas are linked to each other. The key towards creating an effective mind map is to use words, colors and images to assist the brain in conceptualizing ideas as they relate to other ideas.

3.2.3 Effectiveness of Mapping Techniques

Pehkonen (1997) has viewed mind-mapping as great advantage to the mathematics students for the reason that mathematical tasks engaged both left and right hemispheres of the human brain. Whilst the left brain deduced analytically and arithmetically, the right brain was more geometrically. Seyihoglu and Kartal (2010) revealed the opinions of teachers on using the mind mapping technique in Life Science and Social Studies lessons. Teachers think that it would be more appropriate in using the mind mapping technique to oral lessons. While expressing the factors that are providing permanence in students' acquisition and increasing the success in the exams among the advantages of this technique, the possible troubles about time limitation can be expressed among the disadvantages.

The usage of mapping techniques seemed to benefit the slow learners as it was believed that their abilities towards understanding, inquiring and accepting knowl-

edge in an orderly but active manner became more natural (Coffey et al. 2003). With the implementation of concept mapping in engineering course, Kemble and Tembe (2013) reported significant students' performance in problem solving as compared to the traditional way of learning.

3.3 Methodology

This is a cross-sectional study in which samples are drawn to describe its characteristics and study only once. Fifty-three samples were randomly selected to give their opinions on e-INTEGRAL MAP through questionnaire. The samples comprised 53 engineering students from a public university in Sarawak. These students enrolled from two engineering programmes of diploma studies, i.e. Diploma in Electrical Engineering (EE111) and Diploma in Civil Engineering (EC110). The random sampling technique was used to select these respondents from the course code cluster of MAT235 (Calculus II for Engineers) for Semester June–October 2013.

A questionnaire was given to elicit the students' opinion on the usage of e-INTEGRAL MAP in integral calculus learning. In this questionnaire, the students were asked to give their feedback regarding the strengths of the e-INTEGRAL MAP as well as the weaknesses of the e-INTEGRAL MAP. In addition, the samples' recommendation on e-INTEGRAL MAP were also collected through this questionnaire. These perceived views from the samples were collected after they had been exposed to the usage of e-INTEGRAL MAP for 2 months. Descriptive statistics was analyzed and qualitative finding was generated.

3.3.1 e-INTEGRAL MAP, the Interface

The main interface of e-INTEGRAL MAP consists of seven icons; namely Calculus Atlas, Process In e-INTEGRAL MAP, Prior Knowledge, Future Knowledge, List of Formulas, Bridge Map and e-INTEGRAL MAP (Fig. 3.1). The user can freely explore e-INTEGRAL MAP as it provided user-friendly environment to the user. Besides, menus such as Home Content, Help Manual, Glossary, About and Log Out also help the user to explore e-INTEGRAL MAP effectively.

The main map of e-INTEGRAL MAP is known as the Bridging Map. This map is extremely useful when the user explore the integration problem provided. It assists the user in identifying the most suitable map for the relevant integration techniques hence help to disseminate the bridging conceptual knowledge of the procedural learning (Fig. 3.2).

To further assist the user, there are three options of Bridge Map; naming Bridge Map Type-1 (Fig. 3.3), Bridge Map Type-2 and Bridge Map Type-3. Bridging Map Type 1 caters for $\int p(x)^{q(x)} dx$, Bridging Map Type-2 caters for $\int p(x)q(x)dx$ and Bridging Map Type-3 caters for $\int \frac{p(x)}{q(x)} dx$.

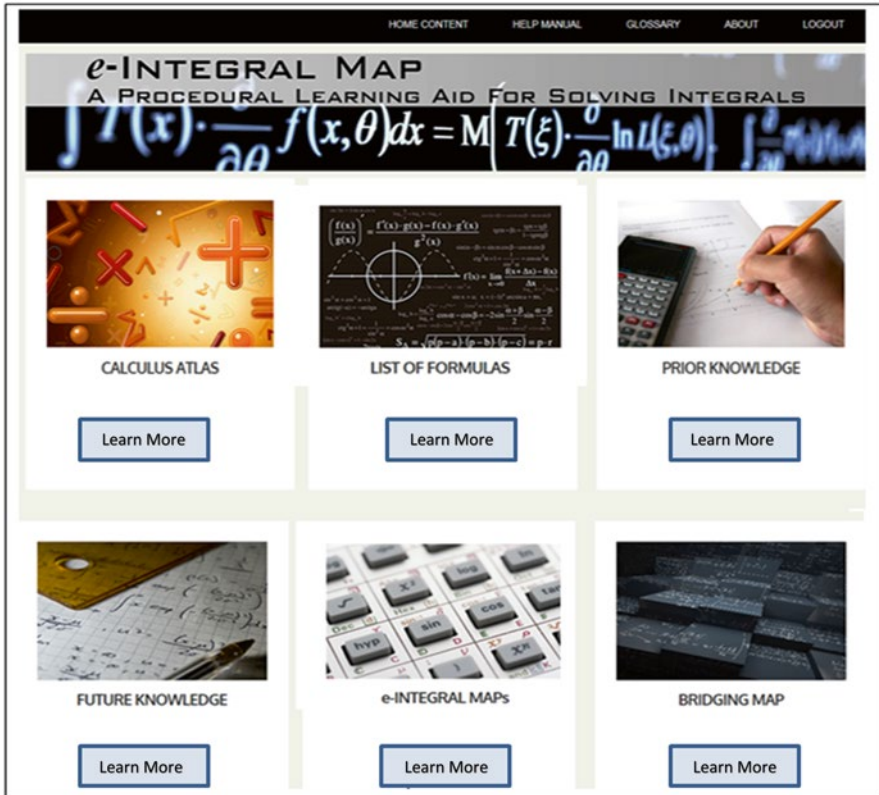


Fig. 3.1 The main interface of e-INTEGRAL MAP

From the Bridge Map, the user can choose to explore any of the seven e-INTEGRAL MAP that contains various integration techniques; namely e-standard integral, e-by u-substitution, e-by parts, e-rational function of $\sin x$ & $\cos x$, e-by trigonometric/hyperbolic substitution, e-by partial fraction and e-product of two trigonometric functions. The specific map of e-by u-substitution is shown in Fig. 3.4.

The e-INTEGRAL MAP also consists of some notes on the Prior Knowledge (Fig. 3.5) that is useful for specific reference when using the maps; at the same time, more potential ideas for the Future Learning can be explored together with Calculus Atlas and List of Formulas.

3.4 Findings

Table 3.1 shows the respondents' views on the usage of the e-INTEGRAL MAP. The results indicated that 52.8 % of the respondents would highly recommend e-INTEGRAL MAP, 28.3 % of them would recommend the map with little or no change whilst 13.2 % of them would recommend the maps only if certain changes

HOME CONTENT
HELP MANUAL
GLOSSARY
ABOUT
LOGOUT

e-INTEGRAL MAP

A PROCEDURAL LEARNING AID FOR SOLVING INTEGRALS

BRIDGING MAPS

BRIDGE MAP TYPE-1
BRIDGE MAP TYPE-2
BRIDGE MAP TYPE-3

General Form	Form of Integral	Function in the integral	More Form of Integral	Example	Technique
Bridging MAP	$\int f(x) dx$ $\int \frac{1}{a^2-x^2} dx$ $\int \frac{1}{\sqrt{a^2-x^2}} dx$	Basic function of x	$\int 2 \ln x dx$ $\int e^{3x} dx$ $\int 2^x dx$ $\int 3^x dx$ $\int \frac{1}{\cos 2x} dx$ $\int \frac{1}{\sqrt{1-x^2}} dx$	$\int 2x dx$ $\int e^{3x} dx$ $\int a^x dx$ $\int 3^x dx$ $\int \sin 2x dx$ $\int \frac{1}{\sqrt{1-x^2}} dx$	Standard Integral
	$\int f(x) x^{n-1} dx$ $\int f(x) f'(x) dx$ $\int \frac{f(x)}{f'(x)} dx$	Basic function of x and its derivative where n is any real number	$\int ax^n dx$ $\int \cot ax dx$ $\int \frac{dx}{a \ln x }$	$\int 2x(x^2)^{-1/2} dx$ $\int (x^2-2)^{-1/2} dx$ $\int \frac{1}{x^2+1} dx$ $\int \frac{1}{\sin^2 x + \tan^2 x} dx$ $\int 4 \tan^2 x dx$ $\int e^x \sin x dx$	Integration by u-Substitution
Bridging MAP	$\int f(x) g(x) dx$	Product of two different standard functions	$\int ax^n dx$ $\int e^x \sin bx dx$ $\int ax \sin^2 bx dx$ $\int \sin^n x dx$ $\int \tan^n x dx$ $\int \ln ax dx$	$\int x e^x dx$ $\int e^x \sin x dx$ $\int x \sin^2 x dx$ $\int x e^{x^2} dx$ $\int \tan^2 x dx$ $\int \ln x dx$	Integration by Parts
	$\int u^n v^m dx$	Product of two trigonometric functions and its power where m, n are positive integers	$\int \sin ax \cos bx dx$ $\int \cos ax \cos bx dx$ $\int \sin^n ax \cos^n ax dx$ $\int \tan^n ax \sec^n ax dx$	$\int \sin 7x \cos 3x dx$ $\int \cos 3x \cos 5x dx$ $\int \sin^3 x \cos^2 x dx$ $\int \tan^2 x \sec^2 x dx$	Integration of Product of Two Trigonometric Functions
Bridging MAP	$\int \frac{p(x)}{q(x)} dx$ $\int \frac{p(x)}{p(x) \pm a^2} dx$ $\int \frac{p(x)}{p(x) \pm bx + c} dx$ $\int \frac{1}{p(x) \pm bx + c} dx$	Polynomial Function p(x) with $x^2 \pm a^2$, $x^2 \pm bx + c$ or $ax^2 + bx + c$	$\int \sqrt{a^2-x^2} dx$ $\int \frac{1}{\sqrt{1-x^2}} dx$ $\int \frac{1}{\sqrt{1+a^2-x^2}} dx$ $\int \frac{1}{1+\sqrt{1-x^2}} dx$	$\int \frac{x}{\sqrt{1-x^2}} dx$ $\int \frac{1}{\sqrt{1-x^2}} dx$ $\int \frac{1}{\sqrt{1+4x^2}} dx$ $\int \frac{1}{\sqrt{1-x^2}} dx$ $\int \frac{1}{1+\sqrt{1-x^2}} dx$	Integration by Trigonometric / Hyperbolic Substitution
	Bridging MAP	$\int \frac{p(x)}{q(x)} dx$	Rational function of two polynomials p(x) and q(x), where q(x) can be factorized completely	$\int \frac{f(x)}{(x+2)(x+5)} dx$ $\int \frac{f(x)}{(x+2)^2(x+5)} dx$ $\int \frac{f(x)}{(x^2+2x+1)(x+4)} dx$ $\int \frac{f(x)}{(x^2+2x+1)(x+4)^2} dx$	$\int \frac{4x^2}{(x+2)(x+5)} dx$ $\int \frac{3x^2+13x+9}{(x+2)^2(x+1)} dx$ $\int \frac{x^2+1}{(x^2+2x+1)(x+4)} dx$ $\int \frac{2x^2+1+9}{(x^2+2x+1)^2} dx$
$\int \frac{dx}{u^2 \pm v^2(x)}$		Rational function of $\sin x$ and $\cos x$ where m, n are positive integers	$\int \frac{dx}{3009x-2619x^2}$ $\int \frac{dx}{3003x-2619x^2}$ $\int \frac{dx}{3007x-2619x^2}$	$\int \frac{dx}{\cos 9x + 4 \sin x}$ $\int \frac{\sin x dx}{1 - \cos x - \cos^2 x}$ $\int \frac{dx}{3007x-2619x^2}$	Integration of Rational Functions of $\sin x$ and $\cos x$

Fig. 3.2 The bridging map of e-INTEGRAL MAP

were made. Only three of the respondents which contributed to 5.7 % chose the last statement, “I would not use and recommend this map”. This clearly showed that the respondents were very positive on the use of e-INTEGRAL MAP in assisting them to learn and solve integral calculus problems.

The finding also shows that the respondents provided positive feedback on their usage of e-INTEGRAL MAP. Below are a few examples of the encouraging comments made by the respondents on the sentiment “useful, helpful and easy to understand”. Ten respondents explained:

“e-INTEGRAL MAP is well done developed with many tables and maps that can guide students according to the steps.”.

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e-INTEGRAL MAP

A PROCEDURAL LEARNING AID FOR SOLVING INTEGRALS

BRIDGING MAPS

BRIDGE MAP TYPE-1
BRIDGE MAP TYPE-2
BRIDGE MAP TYPE-3

BRIDGING MAP TYPE-1

$$\int p(x)^{q(x)} dx$$

$p(x) = \text{Constant}$	$q(x) = \text{Constant}$
$\int a^n dx$	\longrightarrow Standard Integral Map

$p(x) = \text{Constant}$	$q(x) = \text{Algebraic Functions}$
$\int a^x dx$	\longrightarrow Standard Integral Map
$\int a^{f(x)} dx$	\longrightarrow Standard Integral Map or Integration by u-Substitution + Standard Integral Map

$p(x) = \text{Constant}$	$q(x) = \text{Logarithmic Function}$
$\int a^{\ln x } dx$	\longrightarrow Standard Integral Map

Fig. 3.3 The bridging map Type-I of e-INTEGRAL MAP

“Really easy to understand e-INTEGRAL MAP as the maps are provided with accurate information and relevant formulas”.

“e-INTEGRAL MAP helps the students to identify the correct technique used to solve the integration problem.”

“All formulas and explanation can be found in e-INTEGRAL MAP including the explanation on how to solve integrals using different technique of integration.”

“I like the way map been made. Using map really help me to answer the question.”

“Easy to get answer for any integration method.”

“Useful and easy to use once you get the hang on it.”

“Easy to understand and helpful.”

“Useful tool and good for learning.”

“Easy for self study.”

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e-INTEGRAL MAP

A PROCEDURAL LEARNING AID FOR SOLVING INTEGRALS

e-INTEGRALS MAP [e-By u-SUBSTITUTION]

FORM OF INTEGRAL

$\int f(ax) dx$

$\int f'(x)e^{f(x)} dx$

$\int f'(x)[f(x)]^n dx$

$\int \frac{f'(x)}{f(x)} dx$

MORE FORM OF INTEGRAL

$\int (ax + b)^n dx$
 $\int e^{ax} dx$
 $\int \ln |ax| dx$
 $\int \sin ax dx$
 $\int \sin^{-1} ax dx$

$\int e^{ax+b} dx$
 $\int x^{n-1} e^{ax} dx$
 $\int \cos ax e^{ax} dx$
 $\int e^x \sqrt{1-e^x} dx$

$\int 2x \tan ax \sec^2 ax dx$

$\int \frac{\sin(ax+b)}{(\sin+b)^{n-1}} dx$
 $\int \cot ax dx$

EXAMPLE OF INTEGRAL

$\int (2x + 3)^3 dx$
 $\int e^{-4x} dx$
 $\int \ln |4x| dx$
 $\int \sin(2x) dx$
 $\int \sin^{-1} 3x dx$

$\int e^{2x+1} dx$
 $\int xe^{-x} dx$
 $\int 2xe^{2x+3} dx$
 $\int \cos 2x e^{9x+2} dx$
 $\int e^x \sqrt{1-e^x} dx$

$\int 2x(3x^2+3)^3 dx$
 $\int \sqrt{5-x} dx$
 $\int \frac{\ln x}{x} dx$
 $\int \cos x \sin^3 x dx$
 $\int \tan 3x \sec^2 3x dx$
 $\int \sinh x \cosh x dx$

$\int \frac{2}{(2x+1)^2} dx$
 $\int \frac{2x^2}{x^2-4} dx$
 $\int x(1-2x^2)^{-1} dx$
 $\int \cot 2x dx$
 $\int \frac{\sin x}{\sqrt{1+2\cos x}} dx$

PROCESS

Let $u = ax$, Thus
 $\frac{du}{dx} = a \Rightarrow dx = \frac{du}{a}$

Therefore....

$$\int f(ax) dx$$

$$= \int f(u) \frac{du}{a}$$

$$= \frac{1}{a} \int f(u) du$$

(Refer to standard Integral Map)

Let $u = f(x)$, Thus
 $\frac{du}{dx} = f'(x) \Rightarrow dx = \frac{du}{f'(x)}$

Therefore....

$$\int f'(x)e^{f(x)} dx$$

$$= \int f'(x)e^u \frac{du}{f'(x)}$$

$$= \int e^u du$$

$$= e^u + C$$

$$= e^{f(x)} + C$$

Let $u = f(x)$, Thus
 $\frac{du}{dx} = f'(x) \Rightarrow dx = \frac{du}{f'(x)}$

Therefore....

$$\int f'(x)[f(x)]^n dx$$

$$= \int f'(x)u^n \frac{du}{f'(x)}$$

$$= \int u^n du$$

$$= \frac{u^{n+1}}{n+1} + C$$

$$= \frac{[f(x)]^{n+1}}{n+1} + C$$

Let $u = f(x)$, Thus
 $\frac{du}{dx} = f'(x) = dx = \frac{du}{f'(x)}$

Therefore....

$$\int \frac{f'(x)}{f(x)} dx$$

$$= \int \frac{f'(x)}{u} \frac{du}{f'(x)}$$

$$= \int \frac{1}{u} du$$

$$= \ln u + C$$

$$= \ln |f(x)| + C$$

Fig. 3.4 The e-by u-substitution map

EXPLANATION

STEP 1 : Look for some composite function $g(f(x))$ within the integrand for which the substitution $u=f(x)$, $u = f'(x)dx$ produces an integral that expressed entirely in terms of u and du . This may or may not be possible.

STEP 2 : If **Step 1** is successful, evaluate the resulting integral in terms of u . Again, this may or may not be possible.

EXAMPLE

$$\int \sin 2x dx$$

$$\int xe^{x^2} dx$$

$$\int 2x(3x^2+3)^7 dx$$

$$\int \frac{x}{1-2x^2} dx$$

SOLUTION

Let $u = 2x$

$$\frac{du}{dx} = 2 \Rightarrow dx = \frac{du}{2}$$

$$\int \sin 2x dx$$

$$= \int \sin u \frac{du}{2}$$

$$= \frac{1}{2} \int \sin u \frac{du}{2}$$

$$= \frac{1}{2} (-\cos u) + c$$

$$= -\frac{1}{2} \cos 2x + c$$

Let $u = x^2$

$$\frac{du}{dx} = 2x \Rightarrow dx = \frac{du}{2x}$$

$$\int xe^{x^2} dx$$

$$= \int xe^u \frac{du}{2x}$$

$$= \frac{1}{2} \int e^u du$$

$$= \frac{1}{2} e^u + c$$

$$= \frac{1}{2} e^{x^2} + c$$

Alternatively....

$$= \frac{1}{2} \int 2xe^{x^2} dx$$

$$= \frac{1}{2} \int f'(x)e^{f(x)} dx$$

$$= \frac{1}{2} e^{x^2} + c$$

Let $u = 3x^2+3$

$$\frac{du}{dx} = 6x \Rightarrow dx = \frac{du}{6x}$$

$$\int 2x(3x^2+3)^7 dx$$

$$= \int 2x u^7 \frac{du}{6x}$$

$$= \frac{1}{3} \int u^7 du$$

$$= \frac{1}{3} \left(\frac{u^8}{8}\right) + c$$

$$= \frac{1}{24} (3x^2+3)^8 + c$$

Alternatively....

$$= \frac{1}{3} \int 6x(3x^2+3)^7 dx$$

$$= \frac{1}{3} \int f'(x)[f(x)]^n dx$$

$$= \frac{1}{24} (3x^2+3)^8 + c$$

Let $u = 1-2x^2$

$$\frac{du}{dx} = 4x \Rightarrow dx = \frac{du}{4x}$$

$$\int \frac{x}{1-2x^2} dx$$

$$= \int \frac{x}{u} \left(-\frac{du}{4x}\right)$$

$$= -\frac{1}{4} \int \frac{1}{u} du$$

$$= -\frac{1}{4} \ln |u| + c$$

$$= -\frac{1}{4} \ln |1-2x^2| + c$$

Alternatively....

$$= -\frac{1}{4} \int \frac{-4x}{1-2x^2} dx$$

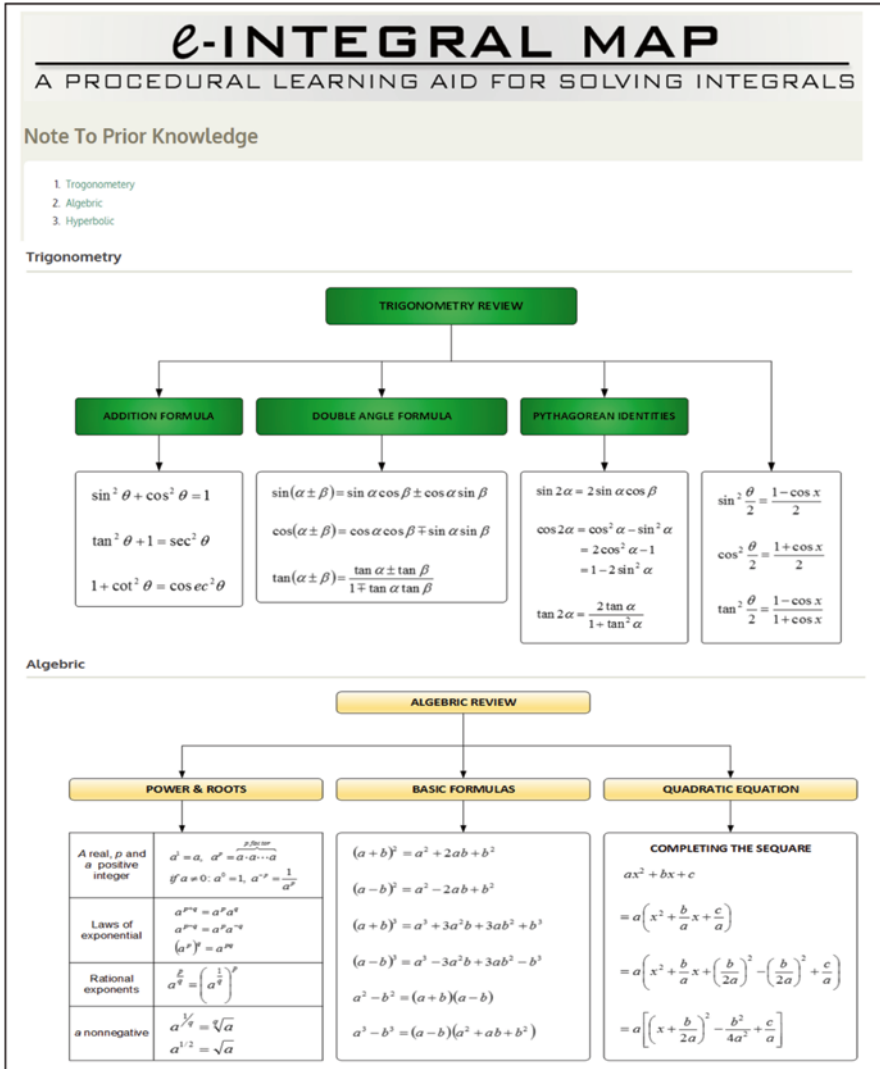
$$= -\frac{1}{4} \int \frac{f'(x)}{f(x)} dx$$

Fig. 3.4 (continued)

When asked about the design of e-INTEGRAL MAP, four respondents viewed it as “systematic and user friendly”. The comments shared by these respondents are as follows:

- “The maps are very systematic.”
- “The maps are easily to understand because have examples we can refer to.”
- “The maps is properly manage and able to guide user efficiently.”
- “I can stimulate faster than other source. Quite an easy understanding example works and procedure of executing any work.”

The qualitative findings also revealed that eight respondents wanted more examples while using e-INTEGRAL MAP to assist their learning process. Below are


ALGEBRIC REVIEW

POWER & ROOTS

A real, p and a positive integer	$a^p = a$, $a^r = a \cdot a \cdot \dots \cdot a$ r times $a^0 = 1$, $a^{-r} = \frac{1}{a^r}$
Laws of exponential	$a^r \cdot a^s = a^{r+s}$ $a^r \div a^s = a^{r-s}$ $(a^r)^s = a^{rs}$
Rational exponents	$a^{\frac{p}{q}} = \left(a^{\frac{1}{q}}\right)^p$
a nonnegative	$a^{\frac{1}{q}} = \sqrt[q]{a}$ $a^{1/2} = \sqrt{a}$

BASIC FORMULAS

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$$

$$a^2 - b^2 = (a + b)(a - b)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

QUADRATIC EQUATION

COMPLETING THE SQUARE

$$ax^2 + bx + c$$

$$= a \left(x^2 + \frac{b}{a}x + \frac{c}{a} \right)$$

$$= a \left[x^2 + \frac{b}{a}x + \left(\frac{b}{2a} \right)^2 - \left(\frac{b}{2a} \right)^2 + \frac{c}{a} \right]$$

$$= a \left[\left(x + \frac{b}{2a} \right)^2 - \frac{b^2}{4a^2} + \frac{c}{a} \right]$$

Fig. 3.5 Prior knowledge

examples of the comments given by three respondents on the sentiment “need more examples with solutions”.

“This map is very good for the students like us to study or revise on the chapter of integration. I think this map can be upgraded. In my suggestion, the way to improve this map quality or grade of this are add more example on every sub-topic and show the best solution that make students easy to remember.”

“Good, but need more examples so that consumers will be able to use it fully.”

“Not all type of equations included in the examples.”

Table 3.1 Comments on the usage of e-INTEGRAL MAP

Comment	Frequency	Percentage (%)
I would use and highly recommend this map	28	52.8
I would use and recommend this map with little or no change	15	28.3
I would use and recommend this map only if certain changes were made	7	13.2
I would not use and recommend this map	3	5.7

3.5 Conclusion

Although there are many teaching aids online, e-INTEGRAL MAP has been developed specially for students' reinforcement in learning the integration techniques in an easy manner. The findings reported in this study revealed the features and significance of e-INTEGRAL MAP as an interactive structured process map which aims to facilitate the learning of integral calculus in a procedural manner. The findings shows the respondents' claims that these maps were useful, helpful, easy to understand, systematic and user friendly. It is hope that this study can serve as inputs and supports on the use of mapping techniques and supplementary technology in mathematics learning enhancement. The findings of this study can also serve as inputs for future studies in developing useful learning aid and evaluating the product for better improvement. The framework in this study will be very useful to anyone who is interested in exploring the related field of study.

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References

- Allen, D. (2001). Learning integral calculus through non-template problem solving. *ProQuest Education Journals*, 11(2), 147–160.
- Buzan, T. (1990). *Use both sides of your brain*. New York: Plume Publishers.
- Buzan, T., & Buzan, B. (1996). *The mind map book: How to use radiant thinking to maximize your brain's untapped potential*. New York: Plume Books.
- Coffey, J. W., Carnot, M. J., Feltovich, P., Hoffman, R. R., Feltovich, J., & Novak, J. D. (2003). *A summary of literature pertaining to the use of concept mapping techniques and technologies for education and performance support*. Pensacola: The Institute for Human and Machine Cognition.
- Kamble, S. K., & Tembe, B. L. (2013). The effect of use of concept maps on problem solving performance and attitude in Mechanical engineering course. *Procedia Social and Behavioral Sciences*, 83, 748–754.
- National Institute of Educational Research. (2004). *Investigations of academic ability and an attitude survey on the feelings of children with regard to their studies*. Retrieved from http://www.nier.go.jp/kaihatsu/katei_h14/H14_h/result.pdf

- Pehkonen, E. (1997). The state-of-art in mathematical creativity. *ZDM*, 29, 63–67.
- Seyihoglu, A., & Kartal, A. (2010). The views of the teachers about the mind mapping technique in the elementary life science and social studies lessons based on the constructivist method. *Educational Sciences: Theory and Practice*, 10(3), 1637–1656.
- Tang, H. E., Voon, L. L., & Nor Hazizah Julaihi. (2008). *The impact of 'high-failure rate' mathematics courses on UiTM Sarawak full-time diploma students' academic performance*. Universiti Teknologi MARA, Research Management Institute: Malaysia.
- Tonkes, E. J., Loch, B. I., & Stace, A. W. (2005). An innovative learning model for computation in first year mathematics. *International Journal of Mathematical Education in Science & Technology*, 36(7), 751–759.

Chapter 4

Science Learners' Conceptions on the Scientific Theory-Law Relationship: A Phenomenographic Case Study

Jasmine Jain, Nabilah Abdullah, and Beh Kian Lim

Abstract This study was grounded on the ultimate goal of science education in Malaysia, which is to produce individuals who are scientifically literate. The study specifically aimed to probe how science learners conceptualize the relationship between scientific theory and law. Guided by the phenomenographic structure of awareness as the methodological framework, this study involved interviewing 10 Secondary Four Science students. Differing from the literature reviewed, the findings revealed that there were unique ways in which the scientific theory-law relationship is conceptualized by the interviewees in the study, namely “Scientific laws are superior to theory” and “Scientific theories are different from law”. The findings inferred the interviewees’ understanding of nature of science as absolute and objective. To summarize, it is pertinent to further probe and rectify incorrect, alternative understanding about science knowledge among science learners to ensure sound understanding about science in promoting students’ motivation to learn science.

Keywords Nature of science • Phenomenography • Science literacy

4.1 Introduction

Producing students who are literate in science has been the aim of science education both locally (Ministry of Education 2006) and globally (AAAS 1990). Scientifically literate means that a person is said to possess the “knowledge and understanding of

J. Jain (✉)

School of Education, Taylor’s University, Taylor’s University Lakeside Campus,
47500 Subang Jaya, Malaysia

e-mail: Jasminejain.soed@gmail.com

N. Abdullah • B. Kian Lim

Faculty of Education, Universiti Teknologi MARA, Section 17 Campus, 40200 Shah Alam,
Selangor, Malaysia

e-mail: nabil789@salam.uitm.edu.my; behki363@salam.uitm.edu.my

scientific concepts and processes required for personal decision-making, participation in civic and cultural affairs, and economic productivity” (National Research Council 1996, p. 22). One of the ways to achieve science literacy among students is to ensure that they understand the nature of scientific knowledge, or better known as the Nature of Science.

4.2 Nature of Science

NOS can be defined simply as an epistemology of science or how science is done (Lederman et al. 2002). Although there has been much disputes among historians, sociologists, philosophers and scientists on what and which nature of science should be manifested to students, most researchers believe that there are seven aspects of NOS which are neutral and should be taught to science learners for the sake of science literacy (Lederman et al. 2002). The aspects are:

- Tentativeness of scientific knowledge
- Empirical nature of science
- The creative and imaginative nature of science
- Theory-laden nature of science
- The relationship between scientific theories and laws
- The social and cultural embeddedness of science
- The scientific method (p. 500–502)

Wheeler-Toppen (2005) contended that individuals can be more critical and analytical if they understand the aspects of NOS. This is because understanding NOS enable individuals to establish internal links between science ideas learned. Corresponding to that, the studies on the conceptions held by students in relevance to constructivist’s framework in science have been an on-going effort in ensuring that learners can make informed judgment about scientific issues in their life. Wheeler-Toppen (2005) also claimed that individuals who do not understand science or the nature of it can hardly participate or contribute to the betterment of the knowledge.

Consistent with that, research has been conducted to examine the conceptions held by learners at various levels (Akerson Buzzelli and Eastwood 2011; Keiser 2010) and even the conceptions held by teachers (Buaraphan 2010; Jones 2010). Albeit the importance of understanding NOS, a review on the past studies suggested that the students continue to hold naïve views about the nature of science (Abd-El-Khalick and BouJaoude 1997). Similar attempts to probe the NOS conceptions among science learners in Malaysia were also found. A study by Eng (2002) using Nature of Scientific Knowledge Scale (NSKS) reported that the percent mean score for the overall understanding of NOS was 53.6 %. Another study conducted by Nyanaseakaran (2004) on Secondary Five students, reported that the overall NOS understanding among his respondents is 64.1 %.

4.3 Theories and Laws

This paper focuses on only one NOS aspect: the need to understand the difference between theories and laws in science (Lederman et al. 2002). According to the American Science Position Statement, “laws are generalizations or universal relationships ... [which] behaves under certain conditions” (NSTA 2000, para. 9). Simply, laws in science are descriptive statements about the discerned patterns of world phenomena that allow human to understand better about these phenomena. On the other hand, scientific theories are well-founded and inferred explanations of those phenomena (Abd-El-Khalick and BouJaoude 1997). From the perspective of scientists, theories and laws in science are two different constructs.

Contrasting with what have been scientist's understanding, previous studies had reported that science learners commonly believed that theory and law possess somewhat hierarchical structure, where theory can develop into law with enough evidences (Dogan and Abd-El-Khalick 2008; Tan and Boo 2003). Such belief in a hierarchical structure led students to perceive theories as less credible knowledge compared to law (Park & Young 2009). Following such findings, it is deemed important to first diagnose and correct these inadequate understandings of NOS among the science learners before they are posted to teach in schools. Although science learning in schools involved the usage of terms “theories” and “laws”, students' understanding of the relationship between theories and laws has been scarce, especially in the local setting. As such, this study aimed to probe in-depth the conceptions held by Malaysian science learners with regard to the relationship between scientific theories and laws.

4.4 Method

This is a qualitative study where data were collected through phenomenographic approach. Phenomenography can be defined as “a description of the limited number of qualitatively different conceptions people may hold of a given phenomenon” (Marton 1981, p. 13). Phenomenography adopts a non-dualistic view which believes that “internal” (thinking) and the “external” (world) are not isolated entities (Saljo 1997, p. 173). Hence, the meaning an individual gives to a certain phenomenon stems from the relationship that exists between the individual (subject) with the phenomenon (object). The purpose of this study in probing the meaning of NOS as experienced by the science learners made phenomenography an ideal methodological framework. However, the findings deriving from this work are limited in terms of generalizability due to its small sample size.

4.4.1 Participants

In the effort to gain data, 10 Secondary Four science learners of a Malaysian public school aged between 15 and 16 were interviewed to investigate the different ways they perceived the theory-law relationship in science. All participants were in science streams who obtained A for their science subject prior to entering Secondary Four. As such, they are taught to have good understanding of scientific concepts. This is also to ensure that they were having similar experiences in studying science.

4.4.2 Data Collection

The interview sessions were guided with the questions adopted from VNOS(C) (Lederman et al. 2002). Instances showing the examples of theories and laws in science were given (Hewson and Hewson 1989) to ensure that “shared definition” (Bowden 2000, p. 58) of the terms “theory” and “law” were achieved. The interview session with every participant lasted for about 40–55 min. All the interviews were recorded both visually and verbally. These raw data were then transcribed, labelled and prepared for data analysis.

4.5 Data Analysis

At the earliest phase of data analysis, the researcher immersed herself by recursive reading of the transcripts (Bowden 2000). The similar meaning was highlighted with colours to ease the process of rechecking. Towards the end of this process, the relevant parts of transcripts which have been identified were analysed for “pools of meaning” (Marton 1981, p. 43) with excerpts illustrating the same pool. One of the pool that were identified was “Law is more believable compared to theories”. This was also the preliminary category which was then further analysed with regards to “awareness” to ensure that the variation of participants’ experiences is captured (Marton 1981). In the phenomenographic perspective, an individual must be aware of something in order to experience it (Marton and Booth 1997). As experiences are always in the context of a phenomenon, an individual experience about a phenomenon depends on how his or her awareness is structured. Structure of awareness (Marton 1997) is commonly used to guide the validity and of phenomenographic study. Cope (2004) also asserted that internal consistency can be reached by fundamentally basing data collection method, nature of interview and data analysis on the structure of awareness. Such structure also shifts the focus off the researchers from interpreting the data using their prior knowledge (Cope 2004).

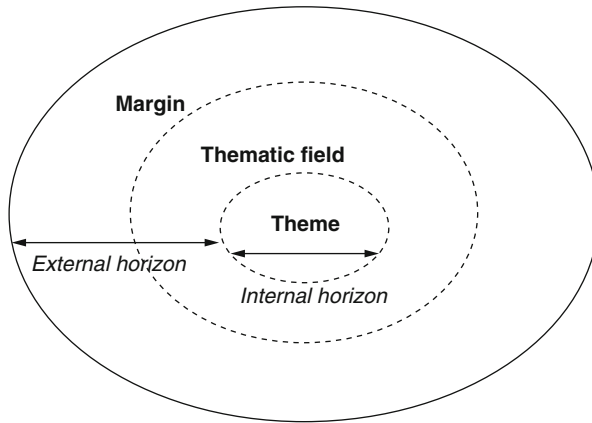


Fig. 4.1 Structure of awareness

In the effort to achieve rigor of research through its internal consistency (Spencer et al. 2003), the analysis of data are highly centred on identifying the structure of awareness of each response received. Generally, the responses gained were identified into three different levels of awareness, namely theme, thematic field and margin.

- Theme: the meaning attached to the phenomenon when respondent articulates their thoughts on scientific theory and law.
- Thematic field: what is directly relevant with the theme but was not focused upon by the respondent during the articulation of thoughts
- Margin: the horizon that a respondent is aware of but did not bring to the fore of awareness when reflecting about a particular phenomenon.

By identifying the structure of awareness, it was found that the preliminary category identified earlier can be better defined as “Law is superior to theory” and “law is different to theory” as the thematic field associated to the theme were explained differently by the respective participants. Figure 4.1 illustrates three-tiered structure of awareness. The validation of the findings was also carried out with the help of three other experts of the philosophy of science.

For example, when asked about what a research participant thinks about the relationship between scientific theory and law, the following response was given.

Law is more true than theory. Law is like...erm...nature's rules which can't be...[paused]... how do I put it...In chemistry for instance, a chemical, when mixed with another chemical, it will be a specific mixture, and not other mixtures. For example, Sodium has a charge while Sulphate has two negative charges. So when they are mixed, it will Secondary Na_2SO_4 . It will not become NaSO_4 ...theories is invented based on that and somehow or later, it becomes law. (Participant 1)

In the example above, the theme identified to be the focus of the Participant 1's explanation is the superiority of law. This is because it was the first notion that

Participant 1 associated with, inferring that it was the theme of the phenomena as he is aware of. This notion was derived from his experience and knowledge about scientific theory and law which were used to support his idea about the superiority of law and hence, the thematic field is based on the knowledge of theory and law. The margin of such conception which was subtly articulated by him is the conception that science is an objective knowledge.

Unlike other qualitative studies which normally carry out inter-rater reliability derived from the objectivist's paradigm, phenomenographic study uses inter judge communicability which is defined as 'the communicability of categories and thus gives the researcher information that someone else can see the same differences in the material as he or she does' (Saljo 1988, p. 45). The focus is not on whether the other researcher can derived with the same findings, but rather on how the outcome finding is described. In this study, inter-judge communicability has been carried out with three experts who taught Philosophy of Science in one of the local public universities. To check the reliability of findings of the present study, the three experts were provided with a list of categories found through the analysis and a separate list constituted of the labels describing the categories. These experts were asked to match the categories to its descriptions in the labels and subsequently derive meaning from the outcome space provided. Although at first there were mismatches of the categories with its labels, it provided insights to how the descriptions can be revised and amendments were made to improvise the results. Finalized outcome space agreeable by the three experts indicated that the findings of the present study are reliable.

4.6 Findings

Analysis using the analytical framework of awareness (Cope 2004) resulted in two major categories, namely Law is superior to theory (Category A) and Law is different from theory (Category B) as described in the subsequent subheadings.

Despite being introduced to scientific law through formal instruction at this point of educational tier (Secondary Four), there are three students who still appeared confused and unsure when asked to distinguish what are "law" and "theory" in science. Although there are few respondents that were confused about what relationship between law and theory in science is, they articulated what they think law in science actually is. The following excerpts describe their notion of law to them.

Law cannot change, because we learn it until now. So they invent things depend on the law, and they cannot change the law. (UR3H)

They are also explanation, but they are slightly different from the theory. I think law has been more proven compared to theories. (UR4H)

Law is something which...(pause)...has been proven that it is real. (UR5H)

They had the notion that law in science is somewhat proven too, and more convincing compared to theory. However, they felt rather reserved when the researcher

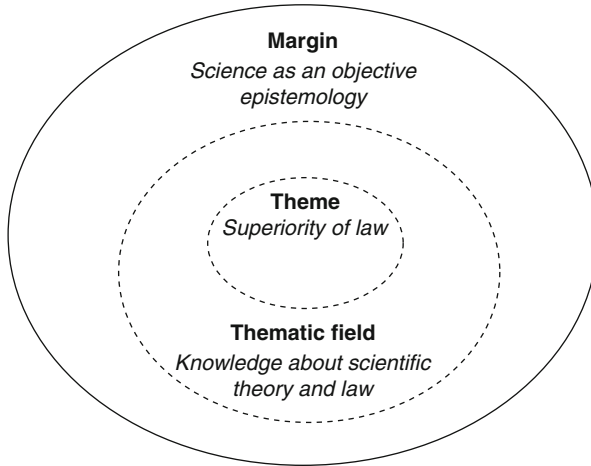


Fig. 4.2 Structure of awareness for Category A: law is superior to theory

asked about what they think the relationship between law and theory in science was. Other responses provided by the participants interviewed at this tier are categorized as “law is more superior to theory” (Category A) and “Law is different than theory” (Category B).

4.6.1 Category A: Law Is Superior to Theory

4.6.1.1 Theme

When contemplating the scientific theory- law relationship, the respondents brought to the fore of their awareness that “law is superior to theory” (Fig. 4.2). The higher status of law was emphasized by the respondents when they inferred the meanings they attached to the relationship between theories and laws in science.

Participant 2 and Participant 7, for example, indicated the conception favouring scientific laws as proven facts. They said:

Law, I think is the final result, law is the foundation, the last final result. I think it won't change because it's what it seemed. Like it is true already. If theory we can still investigate. Theory becomes law I think. (Participant 2)

I think theory can become law, if they can proof that the theories are real. (Participant 7)

They felt that theories which are proven and are supported with ample evidences can be upheld as laws. Participant 9 who held a similar view, added technology as a facet in aiding the “upgrade” of the status from theory to law. Participant 9 provided the following account.

Can, theory can become law, when technology is more sophisticated and those theories which have been investigated repeatedly can become law. (Participant 9)

4.6.1.2 Thematic Field & Margin of Category A

When reflecting about the relationship between theory and law, the field in which the theme was derived from was associated with the learners' knowledge about theory and law through their experiences. For example, law was referred to as rules readily made and obeyed perceived as nature's rule.

Law? Law is like...erm...nature's rules which can't be...[paused]...how do I put it...In chemistry for instance, a chemical, when mixed with another chemical, it will be a specific mixture, and not other mixtures. For example, Sodium has a charge while Sulphate has two negative charges. So when they are mixed, it will Secondary Na_2SO_4 . It will not become NaSO_4 ...theories is invented based on that and somehow or later, it becomes law. (Participant 1)

Laws are like...[paused]...rules which cannot be changed. (Participant 5)

Science was perceived as true knowledge in the margin of participants' awareness. This was because laws in science were referred as entity containing truth, refined and developed further from theories. Science knowledge is perceived as objective in this sense.

4.6.2 Category B: Law Is Different from Theory

4.6.2.1 Theme

Another way of conceptualizing scientific theories and laws reflected theories and laws as two different entities. Different from the previous category, the respondents brought about the differences in theory and law to the focal of their awareness. However, both theory and law are seen as different merely because they encountered the terms used in different settings. The respondents were referring to law as something fixed and will never change. Figure 4.3 details the structure of awareness for Category B.

For example, Participant 8 referred laws as different because laws unanimously agreed by all scientists but theories are still under disputes.

Both are different because theories are ways of how things happen while law is law (translated into Malay language). The influence of law is stronger. All theories obey law but we still do not know whether the theories are right or wrong. A law has been proven through experiments and everyone agreed that it is a law but there are still people do not agree about theories.

For Participant 6, he saw that law governs how things happen but theories are postulations of how phenomena happen.

Theory and law are two different things [sic] in an experiment, there must be theory and law. If we conduct the experiment, we follow the law- following the law of gravity for instance. Then after we have conducted the experiment, we postulate a theory about it. The influence of law is stronger because every experiment obeys the laws, but theories are just the explanation of what we get from the experiments only. (Participant 6)

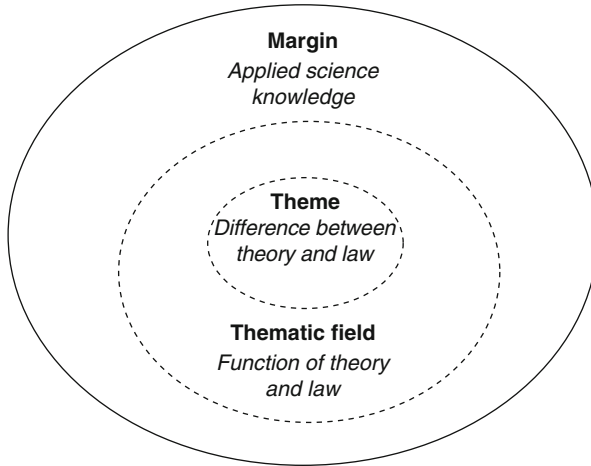


Fig. 4.3 Structure of awareness for Category B: law is different from theory

For Participant 10, laws are regarded as more specific as they can be used for calculations and expressed in terms of scientific formulae.

Theory and law are different, because they explain different things. Law is more specific than theory...like formula and calculations, but both of them are proven through experiment. (Participant 10)

The varied of ways the respondents in Category B experienced science learning made them think that scientific law and theory are two very different entities in science, but law is fixed and theory was portrayed as not.

4.6.2.2 Thematic Field & Margin

While contemplating about the theory-law relationship in science, a theme that was related but not focused upon was the function of theory and law as they experience science learning. The experience of learning science provided them with knowledge about the roles that is undertaken by both theory and law in explaining phenomena.

The margin of the theme brought to awareness while contemplating about the relationship of theory and law was their knowledge obtained from their experience during scientific problem solving. The previous problem solving activities in science which used the formula derived from laws were placed at the peripheral of their awareness. This experience surfaced as the interviewees reflected on their experiences with scientific laws, but did not explicitly mention about such experience. Hence, experiences of encountering laws in science were only in their margin of awareness. Although law was explained as “something fixed”, the objectivity is not made the margin of awareness in this category because law was said to be “fixed” and no indication of it entailing “truth”.

4.7 Discussion and Conclusion

In this study, the relationship between theory-law in science was conceptualized differently by the science learners based on their experiences. The category “Law is more superior to theories” was similar with what McComas (1998) has reported as one of the most pervasive misalignment among the learners’ and scientists’ understanding in NOS.

Unique to this study, was the finding that there were other ways of understanding the relationship between scientific theories and laws in science by the science learners other than the one reported in the literature. The categories “Law is different from theory” was not explicitly found to be reported previously. This is a unique conceptions adapted by the respondents in understanding what they have learnt and experienced from their surroundings. McComas who earlier reported on the pervasive misalignment in scientist-learner conceptions (McComas 1998) later on reviewed 15 textbooks in the United States suggested that the textbooks used maybe the contributing factor leading to the understanding that theories develops into laws (McComas 2004). His analysis deduced that none of the 15 textbooks accurately portrayed precise elaborations, explanations or definitions in regards to theories and laws. A quick survey by the researcher of the local science textbooks also found that there is no clear elaboration about the meaning of scientific theory and law in any of the local textbook. With inadequate definitions of scientific theories and laws in science textbooks, science learners are left to figure out the meaning of theory and law themselves, with wrong conception impede the robust understanding of NOS. The findings of this study suggested that an effective course should be tailored to diagnose the existing conceptions held by the science learners to promote more holistic understanding of NOS in school. This, in turn, will produce science learners who are more literate in science, in line with the global objective of science education.

References

- Abd-El-Khalick, F., & BouJaoude, S. (1997). An exploratory study of the knowledge base for science teaching. *Journal of Research in Science Teaching*, 34(7), 673–699.
- Akerson, V. L., Buzzelli, C. A., & Eastwood, J. L. (2011). Bridging the gap between pre service early childhood teachers’ cultural values, perceptions of values held by scientists, and the relationships of these values to conceptions of nature of science. *Journal of Science Teacher Education*, 23, 133–157. doi:10.1007/s10972-011-9244-1.
- American Association for the Advancement of Science (AAAS). (1990). *Science for all Americans*. New York: Oxford University Press.
- Bowden, J. A. (2000). The nature of phenomenographic research. In J. A. Bowden & E. Walsh (Eds.), *Phenomenography* (pp. 1–18). Melbourne: Royal Melbourne Institute of Technology University Press.
- Buaraphan, K. (2010). Pre-service and in-service science teachers’ conceptions of the nature of science. *Science Educator*, 19(2), 35–47.
- Cope, C. (2004). Ensuring validity and reliability in phenomenographic research using the analytical framework of a structure of awareness. *Qualitative Research Journal*, 4(2), 5–18.

- Dogan, N., & Abd-El-Khalick, F. (2008). Turkish grade 10 students' and science teachers' conceptions of the nature of science: A national study. *Journal of Research in Science Teaching*, 45(10), 1083–1112.
- Eng, G. G. (2002). *The understanding of the nature of science and its relationships with cognitive level, science major and academic achievement of secondary six science students*. Unpublished Master's dissertation, University of Malaya, Malaysia.
- Hewson, P., & Hewson, M. (1989). Analysis and use of a task for identifying conceptions of teaching science. *Journal of Education for Teaching*, 15(13), 191–209.
- Jones, W. I. (2010). *Examining pre-service science teacher understanding of nature of science: Discriminating variables on the aspects of nature of science*. Doctoral dissertation, The Ohio State University. (UMI Number: 3435700).
- Keiser, J. C. (2010). *Identifying variations in thinking about the nature of science: A phenomenographic study*. Doctoral dissertation, University of Minnesota. (UMI Number: 3408404).
- Lederman, N. G., Abd-El-Khalick, F., Bell, R. L., & Schwartz, R. S. (2002). Views of nature of science questionnaire: Toward valid and meaningful assessment of learners' conceptions of nature of science. *Journal of Research in Science Teaching*, 39(6), 497–521.
- Marton, F. (1981). Phenomenography – Describing conceptions of the world around us. *Instructional Science*, 10, 177–200.
- Marton, F. (1997). Towards a theory of quality in higher education. In B. Dart & G. Boulton-Lewis (Eds.), *Teaching and learning in higher education* (pp. 177–200). Camberwell: Australian Council for Educational Research.
- Marton, F., & Booth, S. (1997). *Learning and awareness*. Mahwah: Lawrence Erlbaum.
- McComas, W. F. (1998). The principal elements of the nature of science: Dispelling the myths. In W. F. McComas (Ed.), *The nature of science in science education: Rationales and strategies* (pp. 53–70). Boston: Kluwer Academic Publishers.
- McComas, W. F. (2004). A textbook case of the nature of science: Laws and theories in the science of biology. *International Journal of Science and Mathematics Education*, 1, 141–155. doi:10.1023/B:IJMA.0000016848.93930.9c.
- Ministry of Education Malaysia. (2006). *Integrated curriculum for secondary schools curriculum specifications science secondary 5*. Malaysia: Curriculum Development Centre.
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academic Press.
- National Science Teachers' Association. (2000). *NSTA position statement on nature of science*. Retrieved on August 8, 2012, from <http://www.nsta.org/about/positions/natureofscience.aspx?print=true>
- Nyanaseakaran Sivaratnam. (2004). *Technical students' understanding of the nature of science and its relationships with academic achievement and gender*. Unpublished Master's dissertation, University of Malaya, Malaysia.
- Park, D. Y., & Young, B. K. (2009). Different conceptions of the nature of science among pre-service elementary teachers of two countries. *Journal of Elementary Science Education*, 21(2), 1–14.
- Saljo, R. (1988). Learning in educational settings: Methods of inquiry. In P. Ramsden (Ed.), *Improving learning: New perspectives* (pp. 32–48). London: Kogan Page.
- Saljo, R. (1997). Talk as data and practice: A critical look at phenomenography inquiry and the appeal to experience. *Higher Education Research and Development*, 16(2), 173–190.
- Spencer, L., Ritchie, J., Lewis, J., & Dillon, L. (2003). *Quality in qualitative evaluation: A framework for assessing research evidence*. Report prepared by the National Centre for social research on behalf of the Cabinet Office. London: National Centre for Social Research.
- Tan, L. T., & Boo, H. K. (2003, November). *Assessing the nature of science views of Singaporean pre-service teachers*. Paper presented at the annual conference of the New Zealand Australian Association for Research in Education, Auckland, New Zealand.
- Wheeler-Toppen, J. L. (2005, January). *Teaching nature of science tenets: Is it time for a change?* Paper presented at the Association of Science Teacher Educators (ASTE) 2005 Conference, Colorado.

Chapter 5

Attitude on Microteaching: A Study on Third and Fourth Year Science Student Teachers of the Faculty of Education, UiTM

Johan Eddy Luaran, Kamarol Baharen Mohd Rom, and Jasmine Jain

Abstract This research investigates the attitude of the Third and Fourth Year student teachers in Science Programs from Faculty of Education, UiTM. The objectives of this study is to gather student teachers' attitude towards microteaching subject and to identify the difference in attitude about microteaching among Third and Fourth Year Science student teachers. Eighty Science student teachers were involved in this study. The respondents from Fourth Year of study had completed their microteaching course and had done their practical teaching in school during previous semester while the Third Year Science students only completed their microteaching course. Each respondent answered a set of questionnaires consisted of 40 items made up of three parts which are demographic information, student's attitude and open-ended questions. The findings of the study indicate that the student teachers have mixed attitude towards microteaching that warrant further studies.

Keywords Microteaching • Science student teachers

5.1 Introduction

Currently, there are many higher institutions opening in Malaysia which offer various courses to those who opt to further their studies into higher public and private institution or into teacher training colleges. However, only a few higher institutions

J.E. Luaran (✉) • K.B. Mohd Rom
Faculty of Education, Universiti Teknologi MARA, Campus Section 17, 40200 Shah Alam,
Selangor, Malaysia
e-mail: johaneddy@salam.uitm.edu.my

J. Jain
School of Education, Taylor's University, Taylor's University Lakeside Campus, 47500
Subang Jaya, Malaysia

in Malaysia offer courses for education programs namely Sultan Idris University of Education (UPSI), Universiti Teknologi MARA (UiTM), University Technology Malaysia (UTM) and etc. To enroll into education programs, applicants are required to meet the standards set by the Ministry of Education such as Malaysian Educators Selection Inventory (MEdSI) Test and then followed by passing an interview. The qualified candidates are then streamed into teacher preparatory programs, where they are expected to be well-trained and serve as dedicated and competent teachers thereafter.

In the Faculty of Education, UiTM, one of the core requirements is for student teachers to pass the microteaching and teaching practice. Microteaching subject is taken before student teachers go for their teaching practice in school. Microteaching provides opportunity for student teachers to experience the vignette of school's practicum session. Microteaching intends to develop student teacher's confidence to teach in front of a crowd, and hopefully, to teach effectively. In UiTM, microteaching subject is taken by the third year student teachers during their course of studying before they are placed in school in their fourth year. Student teachers need to pass all the courses during their third year as a pre-requisite to enter their fourth year. Microteaching is being introduced to bring and expose the student teachers to the classroom environment and at the same time they can learn and gain experience on several types of teaching techniques (Wan Zarina and Nik Azraini 2008). Microteaching can guide and give opportunity to student teachers to explore and reflect on themselves with regard to teaching methods used to enhance their teaching techniques and strategies (Muhlise 2009). Microteaching subject implemented in UiTM is "peer teaching" where the teaching process is conducted in front of a small group of peers and supervised by a lecturer. The supervisor critically evaluates and observes the student teachers' teaching skills, and provides constructive feedback to help student teachers reflect back on their teaching performance to understand the dynamism of teaching and learning processes in a classroom (Wan Zarina and Nik Azraini 2008). However, Wan Zarina and Nik Azraini (2008) indicated that student teachers who cannot see the significance of microteaching with their teaching practice often feel demotivated to commit themselves completely. Therefore, microteaching sessions are often taken for granted or decide to not do it. Several numbers of reasons why this problem occur is because of the non-natural classroom environments, material production procedures, and limited time of course schedules, where it reduces the efficiency of microteaching (Stanley 1998, in Muhlise 2009). To bridge the theory and the implementation, this study then takes the initiative to study on the attitudes of student teachers towards microteaching.

5.2 Literature Review

Based on the National Commission on Teaching and America's Future [NCTAF] (1996) in Maria (2006), it stated that in ways to develop the teaching and learning process to come alive, the implementation on the methods of teaching needs to

inspire, motivate, and help the student teachers. Maria (2006) further supported the point by saying that it is important to engage the student teachers in several experiences of teaching to cater to more student teachers' interest and thinking about the teaching and learning process. Thus Microteaching lesson study (MLS) had been developed to provide the student teachers with hands-on teaching experiences that engage them in cycles of planning, reflecting on and revising lesson (Fernandez 2005 in Maria 2006).

According to Khaled (2010), "[The word] microteaching was coined in the early and mid-1960s by Dwight Allen and his colleagues at the Stanford Teacher Education Program." Microteaching as a course then spread to the majority of teacher training institutions recognizing it as a core subject which has been made compulsory to all student teachers. Amobi (2005) who supported the similar notion mentioned that student teachers benefit from it because microteaching increases their competencies of teaching skills and techniques through the hands-on experience. He also stated that the use of microteaching in teacher education programs has expanded from its main focus which the mastery of discrete teaching skills to providing opportunities of teaching experience and orientating the student teachers to teach in the natural classroom during field experience.

Microteaching can be the best and effective tools in developing good and skillful teachers. Based on a research by Khaled (2010) in his research, he says that microteaching can give chances to the student teachers to practice their teaching skills and get feedback on their performance from their friends and supervisor as it can increase and enhance student teachers' skills in teaching and classroom management. In addition, Muhlise (2009) in his study stated that microteaching activities exposed the student teachers to several kinds of experiences regarding teaching profession especially in preparing and conducting lesson plans according to the students' abilities, needs and capabilities to receive the knowledge. Arend (2009), pointed out that microteaching can help the student teachers reduce their level of anxiety, fear to stand in front of the class that result in self-confidence and awareness on teaching as a profession Abdurrahman (2010) says that microteaching has already been seen as a successful method to gain teaching experience among the student teachers and in the same way to improve their pedagogical skills by involving the cycle of teach-again teaching.

Muhlise (2009) stated that lesson plans is the initial stage of microteaching whereby student teachers can experience teaching. Richards (1998) (as in Muhlise 2009) compared lesson plans prepared by the student teachers who are less experienced with the experienced teachers and found that less experienced teachers tend to follow their plan and depending on it while the experienced teachers tend to divert some points in their lesson plans or adding activities to provide more practice. Muhlise (2009) also stresses that microteaching has its limitations but nonetheless, the significance of it is undeniable. He stated that, the self-motivation in every student teacher to improve themselves by reflecting the feedback from others may bring the improvements in teaching skills.

The purpose of this study is to answer the following research objectives:

Table 5.1 Sub construct of the questionnaire

Sub domain	Item number
Students' attitude towards microteaching in negative manner	33, 34, 35, 36, 37, 38, 39, 40
Students' attitude towards microteaching in positive manner	2, 3, 5, 6, 7, 19, 26, 27, 28, 29, 31, 32
Students' attitude towards microteaching regarding type of course	1, 4, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 23, 24, 25, 30

- (i) To gather the student teachers' attitude towards their microteaching class.
- (ii) To identify the difference in attitude between Third and Fourth Year Science student teachers towards microteaching as a course.

5.3 Research Methodology

This study was conducted through surveys. The samples of this study are Third Year (Part 5) and Fourth Year (Part 8) of the student teachers under Science Programs majoring in Chemistry, Biology and Physic from Faculty of Education, UiTM. The number of samples in this study consists of 80 student teachers constituted by 19 respondents from Third year and 61 respondents from fourth year Science student teachers. Only the third year and fourth year students were included in this study as they experienced the microteaching course.

The questionnaire for this study was adopted from Khaled (2010). The questionnaire consists of three parts; Part 1 covers the demographic information of the respondent, Part 2 is about the student teachers' attitude on microteaching subject which consists of 40 items and the last part which is Part 3 is an open-ended questions. For the item of questionnaire in Part 2, the researcher used Likert-scale, which consists of four options; strongly agree (1), agree (2), disagree (3) and strongly disagree (4). The 40 items were divided into four sub construct as depicted in Table 5.1.

5.4 Results and Discussion

5.4.1 Student Teachers' Attitudes Towards Their Microteaching Class

Table 5.2 shows that Year 3 and Year 4 Science student teachers have no difference in mean for all items under the sub domain students' attitudes towards microteaching regarding type of course. Majority of the respondents agreed that microteaching subject is a productive and valued course to them. In short, they considered that microteaching subject can help them in many ways.

Table 5.2 Students' attitudes towards microteaching regarding type of course

No.	Item	Year 3		Year 4	
		Mean	S.D	Mean	S.D
1.	Microteaching is vital to bridge the gap between theory and practice	1.79	.419	1.70	.667
4.	Microteaching provides me with specialized knowledge for teaching and learning	1.63	.597	1.52	.504
8.	Microteaching helps me reflect on knowledge-in-action by observing others' practices	1.84	.688	1.64	.606
9.	Microteaching helps me to evaluate others' teaching techniques by seeing them teach	1.74	.562	1.54	.565
10.	Microteaching helps me appreciate the importance of shared experience of practice in building up my own experience	1.68	.582	1.59	.559
11.	Microteaching helps me to learn how to write and conduct a good lesson plan	1.47	.612	1.66	.629
12.	Microteaching provides me with a good chance to select appropriate teaching materials	1.89	.567	1.56	.592
13.	Microteaching promotes my ability to provide clear instruction and models	1.74	.562	1.66	.544
14.	Microteaching is an artificial teaching environment	1.89	.459	1.72	.636
15.	Microteaching makes me discover good and bad language teaching behaviors	1.89	.459	1.70	.615
16.	Microteaching allows for a great deal of teaching methods	1.79	.419	1.61	.556
17.	Microteaching helps me speak in English to a reasonable degree of fluency	1.84	.602	1.74	.575
18.	Microteaching develops my ability to stimulate classroom interaction	1.68	.582	1.70	.558
20.	Microteaching helps me to learn how to divide up the class, individual and teams	1.84	.501	1.77	.589
22.	Microteaching helps me to learn how to use different techniques for class management	1.68	.478	1.75	.596
23.	Microteaching helps me learn how to introduce different stages of the lesson	1.74	.562	1.69	.534
24.	Microteaching develops my ability to exploit different teaching supports (blackboard, audio, video etc)	1.58	.607	1.56	.533
25.	Microteaching builds my capacity to use simulations to make the classroom activity more relevant and real	1.79	.535	1.69	.593
30.	Microteaching builds up my ability to use my voice to the full (voice-audibility)	1.68	.582	1.70	.691

Reference: 1-Strongly agree, 2-Agree, 3-Disagree, 4-Strongly disagree

Table 5.3 Students' positive attitude towards microteaching

No.	Item	Year 3		Year 4	
		Mean	S.D	Mean	S.D
2.	Microteaching activities motivate me in my present courses	1.68	.478	1.52	.504
3.	Microteaching is favorable for my future occupation	1.58	.507	1.62	.610
5.	Microteaching is enjoyable and beneficial when applied individually	2.00	.667	1.69	.620
6.	Microteaching is beneficial for evaluating my teaching performance	1.74	.562	1.54	.535
7.	Microteaching gives me a good chance to reflect on my performance	1.84	.501	1.54	.594
19.	Microteaching improves my ability to conduct class management to the full	1.79	.535	1.75	.596
21.	Microteaching improves my ability to use time efficiently	1.84	.688	1.70	.667
26.	Microteaching improves my ability to use non-verbal gestures and facial expressions	1.84	.501	1.69	.593
27.	Microteaching helps me build my own self-confidence	1.68	.478	1.61	.585
28.	Microteaching helps me reduce the degree of shyness, fear and anxiety	1.79	.535	1.69	.696
29.	Microteaching improves my ability to stimulate students' interest	1.74	.562	1.69	.696
31.	I enjoy dealing with microteaching activity or subject	1.74	.562	1.67	.598
32.	Microteaching is useful for getting experience	1.63	.597	1.56	.563

Reference: 1-Strongly agree, 2-Agree, 3-Disagree, 4-Strongly disagree

Based on Table 5.3, there are differences in mean for both Third and Fourth Year Science student teachers. Most of them have positive attitude towards microteaching subject seeing it as beneficial for future teacher. According to Khaled (2010), microteaching can provide the student teachers with specialized knowledge in teaching and learning process and also can helps them make their teaching process more interesting and fun.

Table 5.4 shows students' negative attitude towards microteaching. It shows that there are big difference in mean between Third Year and Fourth Year. It shows that most of Part 8 has negative attitude towards microteaching subjects because of they have a lot of experience on it throughout the semester and they already go for their microteaching and have their own understanding towards the microteaching subject on how it benefits to them. Several numbers of problems that usually rise up among the student teachers such as because of the non-natural classroom environments, material production procedures and time limited course which can reduce the efficiency of microteaching (Stanley 1998 in Muhlise 2009).

Table 5.4 Students' attitudes towards microteaching in negative manner

No.	Item	Year 3		Year 4	
		Mean	S.D	Mean	S.D
33.	I think that microteaching is risky when I put myself up for criticism by my peers	3.26	.806	2.07	.704
34.	I think that microteaching can be threatening and demoralizing experience	3.05	.621	2.07	.704
35.	I think that microteaching is costly in terms of the hardware that may use	3.05	.621	2.54	.886
36.	I think that microteaching activities are time consuming (they are not useful)	3.16	.958	2.03	.774
37.	I think that the classroom environment seems artificial to me when I present a microteaching lesson	3.21	.419	2.66	.834
38.	I have difficulties while producing materials for microteaching activities	2.89	.737	2.26	.794
39.	Microteaching activities create obstacles within learning process	3.16	.501	2.15	.792
40.	Microteaching is time limited, so I cannot teach freely as a teacher	2.95	.524	2.80	1.046

Reference: 1-Strongly agree, 2-Agree, 3-Disagree, 4-Strongly disagree

Table 5.5 Mean difference between third year and fourth year science students' attitudes towards microteaching subject

Sub domain	Year 3		Year 4	
	Mean	S.D	Mean	S.D
Students' attitudes towards microteaching regarding course type	1.75	.359	1.66	.423
Students' attitudes towards microteaching in positive manner	1.76	.371	1.64	.457
Students' attitudes towards microteaching in negative manner	3.09	.450	2.32	.548

5.4.2 The Difference in Attitude Between Third and Fourth Year Science Student Teachers Towards Microteaching Subject

Based on Table 5.5, the researcher had evaluated all the items in three sub construct in this study to see the differences between Third Year (Part 5) and Fourth Year (Part 8) Science students' attitude towards microteaching. The three sub construct are students' attitudes towards microteaching in negative manner, students' attitudes towards microteaching in positive manner and students' attitudes towards microteaching regarding the type of course. Its shows that majority of the respondents agreed with all the items under the sub construct students' positive attitude towards

microteaching. There is also no huge difference in mean where both Year 3 students teachers (mean = 1.75) and Year 4 student teachers (mean = 1.65) generally looked at microteaching as a beneficial course.

However, for sub domain students' negative attitudes towards microteaching, we can see that there is a difference in mean between Year 3 and Year 4 Science student teachers with 3.09 and 2.32 respectively. From the mean obtained, it shows that many of the respondents from Year 4 agreed with most of the items under this sub domain while most of Year 3 students disagree with all the negative attitude towards microteaching. Generally, most of Part 8 students have both positive and negative attitude towards microteaching as they have gained more of the authentic experiences in teaching through their teaching practice. This led them to feel that microteaching does not provide them with so much benefit.

5.4.3 Advantages and Disadvantages of Microteaching Based on the Attitudes of Third and Fourth Year Science Student Teachers

Based on Table 5.6, the researcher has evaluated 124 responses given by the respondents about the microteaching subject and categorized all of them under seven themes. It shows that the three highest themes that given by the respondents are; microteaching subject have given them a chance to learn how to manage the classroom in proper way (22 %), increase their self-confidence in teaching and confront the students (18 %) and provide them a room to practice in preparing to become a teacher (17 %). On the other hand, the three lowest themes of responses given by the respondents are; microteaching subject can improve their teaching skills (12 %), give experience of teaching in the class in front of their friends (9 %) and only 9 % of responses received by the respondents said that microteaching is useful and helpful to them in writing their daily lesson plan. In addition, there are 13 % of the

Table 5.6 Responses on microteaching as a useful course

Themes	No. of response	Percentage
Class management	27	22 %
Increase self-confidence	22	18 %
As a practice for practical teaching	21	17 %
Sharing process of teaching methods	16	13 %
Improve teaching skills	15	12 %
Teaching experience	12	9 %
Help in writing lesson plan	11	9 %
Total	124	100 %

Table 5.7 Responses on microteaching as not a useful course

Themes	No of response	Percentage
Artificial classroom environment	10	36 %
Different classroom situation	9	31 %
Time consuming	1	3 %
Total	29	100 %

responses from the respondents said that microteaching is good and beneficial to them because they can have a sharing session regarding the teaching methods that can be used and implement in their teaching during their practical. According to Metcalf (1993) in Khaled (2010) in his study, he found that both reflective teaching and microteaching provide valuable experiences in acquiring and practicing professional skills and give positive impact on developing teacher's identity (Mergler and Tangen 2010 in Khaled 2010).

The researchers have also identified the list of reasons on why the respondents regarded microteaching as not useful to them. This list is of reasons are reflected in Table 5.7. The highest percentage is the theme artificial classroom management (36 %) where they feel that microteaching is a well-planned activity and all variables are controllable. Another 31 % of the responses said that microteaching provide different classroom situation as the crowd control is better when their friends are acting out as students but this is irony to the real classroom situation. The last theme is Time consuming with 3 % out of the total responses, as they felt that it takes up a lot of time for each and every one of their classmates to micro-teach.

5.5 Conclusion

In conclusion, this study implies that although it is well known that microteaching offers various benefits in molding future teachers, such course cannot be taken for granted. As reported, student teachers who have experienced teaching practice in school regarded microteaching as less useful as it cannot provide them with ample experiences and challenges as what they have faced in schools during their placement. The shortcoming of microteaching which are less reported and explored in the literature but are found through this study can provide useful measure for future work on enhancing the microteaching course that can suit the need of the student teachers better. With that, the teacher preparatory programs can be made more wholesome in shouldering the nation to produce successful twenty-first century resources for the future.

References

- Abdurrahman. (2010). Learner-centered micro teaching in teacher education. *International Journal of Instruction*, 3(1), 77–100. Retrieved on July 11, 2011, from http://www.eiji.net/dosyalar/iji_2010_1_5.pdf
- Amobi, F. A. (2005). Preservice teachers' reflectivity on the sequence and consequences of teaching actions in a microteaching experience. *ProQuest Education Journals*, 32(1), 115–128. Retrieved on December 20, 2011, from http://www.teqjournal.org/TEQ%20Website/Back%20Issues/Volume%2032/Vol%2032%20PDFS/32_1/amobi-32_1.pdf
- Arend, R. I. (2009). *Learning to teach* (8th ed.). London: McGraw-Hill.
- Khaled, A. D. (2010). *Investigating attitudes of ELT (2) learners towards microteaching*. Retrieved on July 11, 2011, from <http://www.qou.edu/english/conferences/firstNationalConference/pdf-Files/drKhaledDweikat.pdf>
- Maria, L. F. (2006). Prospective teachers' perspectives on microteaching lesson study. *ProQuest Education Journals*, 127(2), 203–215.
- Muhlise, C. O. (2009). Attitudes of the student teachers in English language teaching programs towards microteaching technique. *English Language Teaching*, 2(3), 205–212. Retrieved from <http://www.ccsenet.org/journal/index.php/elt/article/view/3716/3317> on 11 July 2011
- Zarina, W., & Azraini, N. (2008). *A study on microteaching as perceived by UTM TESL undergraduates*. Retrieved on July 11, 2011, from http://eprints.utm.my/11623/1/A_Study_On_Microteaching_As_Perceived_By_UTM_TESL_Undergraduates.pdf

Chapter 6

Use of CAOS Test in Introductory Statistics Subject

Norhayati Baharun and Anne Porter

Abstract The purpose of this study was to examine the students' basic statistical literacy and reasoning using a CAOS test (*Comprehensive Assessment of Outcomes in Statistics* from <https://app.gen.umn.edu/artist/>) at the University of Wollongong. For this reason, a case study was conducted involving samples taken from two cohorts of undergraduate students: 132 students in March/Autumn 2010 and 79 students in March/Autumn 2011 who enrolled in an Introductory Statistics subject (STAT131). A quantitative method was employed using the CAOS test as instrument in addition to the conventional assessments. Students were required to complete a CAOS pre-test (baseline) and post-test (end of session). This test was used as an external measure to assess the students' basic statistical literacy and it generally represents as accepted measure of statistical literacy developed by statistics education researchers. The findings revealed that the students' performance at the baseline (CAOS pre-test) and at the end of session (CAOS post-test) was identical between the two cohorts, 2010 and 2011. However particularly in their final marks, the 2011 cohort outperformed ($p=0.004$) than those in 2010. This implied that some issues regarding its suitability, validity, and reliability will need to take into account when using the CAOS test as to measure students' learning and understanding of statistics. The paper concludes with a discussion on the issues raised and followed by suggestions for further research.

Keywords Assessments • Statistical literacy • Statistical reasoning • Students' outcomes • Students' performances

N. Baharun (✉)

Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA
Cawangan Perak, Kampus Tapah, 35400 Tapah Road, Tapah, Perak, Malaysia
e-mail: norha603@gmail.com

A. Porter

School of Mathematics and Applied Statistics (SMAS), University of Wollongong,
Wollongong 2522, NSW, Australia
e-mail: alp@uow.edu.au

6.1 Introduction

For the purpose of examining the students' basic statistical literacy and reasoning in an Introductory Statistics subject (STAT131) at the University of Wollongong, an instrument called a CAOS test (*Comprehensive Assessment of Outcomes in Statistics*) was used as external measure in addition to the conventional assessments. This case study involved samples taken from two cohorts of undergraduate students; they were 132 students in March/Autumn 2010 and 79 students in March/Autumn 2011. The test was administered at the beginning (pre-test) and the end of session (post-test) for both cohorts.

The CAOS test was developed by a team of statistics education researchers (delMas et al. 2006) based on their work with the ARTIST project funded by The National Science Foundation (NSF). ARTIST is an acronym for "Assessment Resources Tools for Improving Statistical Thinking" accessible from <https://app.gen.umn.edu/artist/index.html>. This tool was designed to measure students' basic literacy and reasoning about descriptive statistics, probability, bivariate data, and basic types of statistical inference.

The test instrument was developed through a 3-year process of development, revisions, and feedback from the ARTIST advisors and class testers, and a large content validity assessment using 30 experienced Advanced Placement Statistics Readers (delMas et al. 2006). The first version of CAOS was developed in late 2004 which consisted of 34 multiple-choice items then followed by the second version of CAOS in January, 2005 consisting of 37 multiple-choice items resulting from additional revisions. After further revisions, the final version of CAOS known as CAOS 4 was developed in late 2005 and it consists of 40 multiple-choice items. Based on a sample of 1470 students, an analysis of internal consistency of the 40 items on the CAOS 4 (post-test) produced an acceptable level of reliability, a Cronbach's alpha coefficient of 0.82 (delMas et al. 2007). Therefore, this test was assumed to be a valid measure of important learning outcomes in an introductory statistics subject. Furthermore, the three learning outcomes that were measured through this test sufficiently closely related to the six general categories in Bloom's taxonomy as briefly discussed in the following section,

... some current measurement experts feel that Bloom's taxonomy is best used if it is collapsed into three general levels (Knowing, Comprehending, and Applying). We see statistical literacy as consistent with the "knowing" category, statistical reasoning as consistent with the "comprehending" category (with perhaps some aspects of application and analysis) and statistical thinking as encompassing many elements of the top three levels of Bloom's taxonomy. (from <http://app.gen.umn.edu/artist/glossary.html> accessed on 24/01/2011)

To date, however only few studies (e.g. delMas et al. 2007; Jersky 2010) were conducted using the test instrument in assessing students' statistical literacy, thinking, and reasoning in comparison to the conventional assessments. Furthermore, the test instrument possibly needs to be examined in terms of its efficiency and adequacy as to align with the desired learning outcomes particularly in STAT131.

Thus, the aim of this study was to determine the suitability and validity of the use of CAOS test as to measure students' performance in an introductory statistics subject.

6.2 Review of Literature

Teaching students to both think and compute, however, proved difficult. Statistics relied heavily on mathematics, in part because data were expensive and calculations were tedious and slow, and so approximation methods were required. ... in order to fully understand statistics, one had to understand it through mathematics.' (Gould 2010, p. 298)

Indeed, mathematics plays an important role in teaching and learning statistics hence this statement seems to lend support to the false implication in Bullock's (1994) assertion that '[m]any statisticians now claim that their subject is something quite apart from mathematics, so that statistics courses do not require any preparation in mathematics'. Not to mention a specific curriculum, Herbert G. Wells contended the role of *numeracy* (particularly mathematics) in societies as essentially a need to produce "good citizens",

The time may not be very remote when it will be understood that for a complete initiation as an efficient citizen of one of the new great complex world wide states that are now developing, it is as necessary to be able to compute, to think in averages and maxima and minima, as it is now to be able to read and write. (Cited in Gould 2010, p. 297)

In the context of teaching and learning statistics, basically there are some degree of differences between these two disciplines, mathematics and statistics, postulated by Moore and Cobb (2000) and Cobb and Moore (1997). However, there is a belief among practitioners that view statistics is another part of the mathematics subject (Morris 2008). Cobb and Moore (1997) argued that for statistics in particular, *data* are not just a matter of numbers; statistics deal with numbers as well as providing a "context" making problems more realistic, and forcing students and teachers to think about the validity and applicability of their solutions. They viewed context differently in mathematics subjects,

... the [fundamental] focus in mathematical thinking is on abstract patterns: the context is part of the irrelevant detail that must be boiled off over the flame of abstraction in order to reveal the previously hidden crystal of pure structure. *In mathematics, context obscures structure...* *In data analysis, context provides meaning.* (Cobb and Moore 1997, p. 803)

In the 1980s when the curriculum had become focused on teaching procedures and rote memory, the design of the curriculum in statistics was evidently unsuccessful in achieving its aim of preparing a citizenry for thinking and computing with data (Gould 2010). Matthews and Clarks (2003) recently discovered that even the best students could not understand the fundamental concepts of statistics several weeks after completing a traditional-based college level introductory statistics subject. As raised by one student: 'I'm not really sure how to explain what [the

mean] would mean. I just know how to do the formula', quoted in Gould (2010, p. 298). Deming (1940) essentially pointed out the substantial role of statisticians that

[a]bove all, a statistician must be a scientist... Statisticians must be trained to do more than to feed numbers into the mill to grind out probabilities; they must look carefully at the data, and take into account the conditions under which each observation arises. (Cited in Gould 2010, p. 298)

Furthermore Deming argued that statistics might use mathematics, but most importantly it was about *data* and hence in the 1990s many statisticians or educators including Moore (1997), Cobb (1991, 1993) and Wild (1994) firmly urged the curriculum designers or educators to put data at the centre of the statistics subject. Gould (2010, p. 307) recently proposed a new definition of *data*,

... [it] should be inclusive, rather than exclusive. It should acknowledge that data are created by both need and accessibility. Data arises from activities, objects, experiences, and relations. Data can be shared and stored and transmitted. Data include a context, but data also create context, as when emails (data) are studied to produce more data to recreate institutional social structures or make a better spam filter.

As noted in Moore (1997, p. 127) the focus in statistics courses has been shifted to include '[m]ore data and concepts... fewer recipes and derivations... emphasize statistical concepts...[and]... point to core statistical ideas that are not mathematical in nature' and this affords more active learning opportunities that align with constructivist views of learning. Garfield and Ben-Zvi (2007) therefore posited the important contributions in statistics education to understanding the nature and development of student's statistical reasoning and what it means to understand and learn statistical concepts. This is necessary in developing the desired learning outcomes in introductory statistics courses where these outcomes are frequently referred to as *statistical literacy*, *statistical reasoning*, and *statistical thinking*.

6.2.1 *Statistical Learning*

In this study, the selection involved the teaching of introductory statistics subject taken by the undergraduate program. The delivery of this subject was high functioning with technology embedded approaches to learning within the e-learning system. Technology has been used to facilitate communication between students and the teacher, and to increase access to learning resources and feedback. It also facilitates the processes of learning the discipline content. That is, it allows students to emphasise the statistical process that precedes the calculations and the interpretation of the results of these calculations. Moore (1997, p. 134) argued the use of technology in teaching and learning statistics:

[c]ontent and pedagogy – our understanding of what students should learn and of effective ways to help them learn – should drive our instruction. Technology should serve content and pedagogy. Yet technology has changed content and allows new forms of effective pedagogy.

and Moore further posited

[t]he most effective teachers will have a substantial knowledge of pedagogy and technology, as well as comprehensive knowledge about and experience applying the content they present.

6.2.2 *Statistical Concepts*

In the context of this study, the author is in accord with the work of Chance, Garfield, delMas, Ben-Zvi, Gould, and Rumsey in their search for a *taxonomy* which affords more effective classification of statistical learning. The three domains: *statistical literacy*, *statistical reasoning*, and *statistical thinking* have been selected to provide the mechanism for defining statistical learning in this study. Garfield and Ben-Zvi (2007) distinguished between the three domains and cautioned statisticians and statistics educators to carefully define the unique characteristics of statistics. The three domains are distinguishable in terms of the cognitive outcomes of statistical learning. They canvassed several definitions, firstly defining *statistical literacy* as

... a key ability expected of citizens in information-laden societies, and is often touted as an expected outcome of schooling and as a necessary component of adults' numeracy and literacy. [It] involves understanding and using the basic language and tools of statistics: knowing what basic statistical terms mean, understanding the use of simple statistical symbols, and recognizing and being able to interpret different representations of data. (Garfield and Ben-Zvi 2007, p. 15)

and *statistical reasoning* as

... the way people reason with statistical ideas and make sense of statistical information. [It] may involve connecting one concept to another (e.g., center and spread) or may combine ideas about data and chance. [It] also means understanding and being able to explain statistical processes, and being able to interpret statistical results. (Garfield and Ben-Zvi 2007, p. 16)

and concluded that *statistical thinking* implicated a higher order of thinking skills (that is, the way statisticians think) rather than statistical reasoning,

[i]t includes the knowing how and why to use a particular method, measure, design or statistical model; deep understanding of the theories underlying statistical processes and methods; as well as understanding the constraints and limitations of statistics and statistical inference. [It] is also about understanding how statistical models are used to simulate random phenomena, understanding how data are produced to estimate probabilities, recognizing how, when, and why existing inferential tools can be used, and being able to understand and utilize the context of a problem to plan and evaluate investigations and to draw conclusions. (Garfield and Ben-Zvi 2007, p. 16)

Rumsey (2002, p. 4) claimed that the definition of *statistical literacy* can be regarded as two different learning outcomes, these are statistical competence that 'refers to the basic knowledge that underlies statistical reasoning and thinking...', and statistical citizenship which 'refers to the ultimate goal of developing the ability to function as an educated person in today's age of information'.

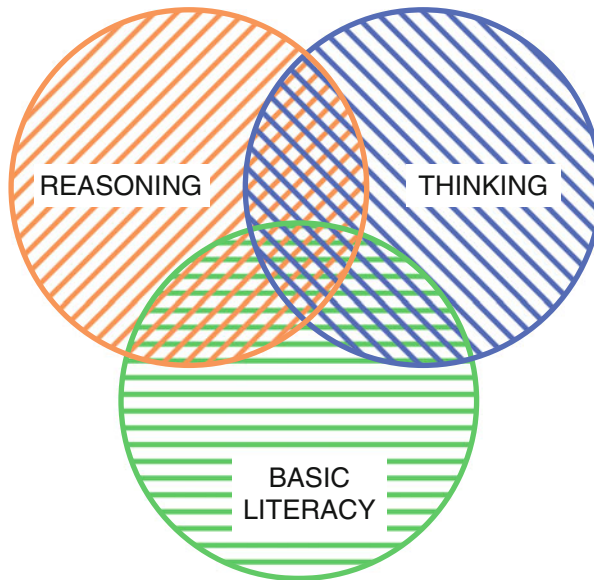


Fig. 6.1 Independent domains with some overlap (Source from delMas 2002, p. 4)

Gould (2010) further viewed the definitions of *statistical literacy* and *statistical thinking* according to two paradigms on how statistics courses are designed, either for “consumers” or “producers” of statistics. He posited that *statistical literacy* seems to be aimed fairly at consumers which refer to individuals who must learn to “read” statistics.

Consumers, ... will read about statistics in the news media, and will need to understand basic statistical concepts (such as median vs. mean) in order to make household decisions and in some cases workplace decisions... they are consumers of statistical summaries. Consumers are majoring in literature, law, and mathematics... (Gould 2010, p. 307)

On the other hand, he postulated that producers are better served in a statistics course that teach *statistical thinking* in which it is more comprehensive competency than statistical literacy.

... [P]roducers will, at some point in their intended career, perform statistical analyses on data that either they or colleagues have collected. Producers are majoring in biology, atmospheric science, social science, psychology, engineering. (Gould 2010, p. 307)

Garfield and Ben-Zvi (2007) contended that the three learning outcomes are unique; however there appears to be some overlap and a type of hierarchy, with statistical literacy serving as a foundation for statistical reasoning and statistical thinking (see Fig. 6.1). The domains proposed by Rumsey (2002), Garfield (2002), and Chance (2002) have been discussed in delMas (2002). delMas compared and contrasted the two different perspectives, showing through Venn diagrams, how the outcomes of instruction are associated (see Figs. 6.1 and 6.2). delMas claimed that

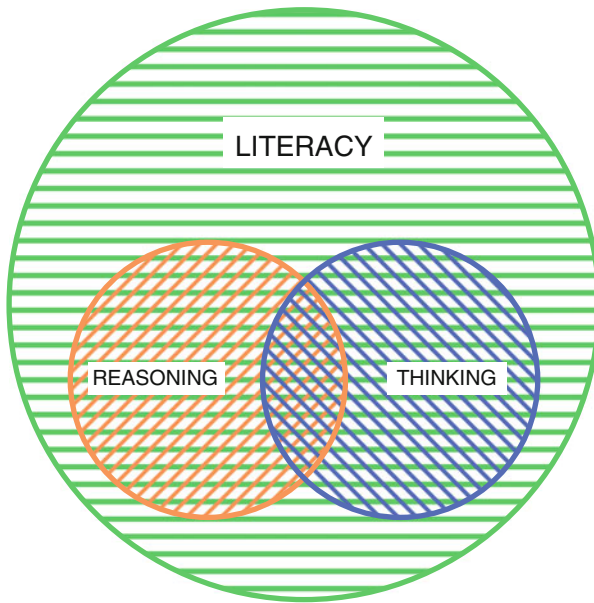


Fig. 6.2 Reasoning and thinking within literacy (Source from delMas 2002, p. 4)

[i]f we focus on literacy as the development of basic skills and knowledge that is needed to develop statistical reasoning and thinking... then a Venn diagram such as the one presented in [Fig. 6.1] might be appropriate. This point of view holds that each domain has content that is independent of the other two, while there is some overlap. (delMas 2002, p. 3)

and the other perspective is represented by Fig. 6.2 in which

[t]his perspective treats statistical literacy as an all-encompassing goal of instruction. Statistical reasoning and thinking no longer have independent content from literacy. They become subgoals within the development of the statistically competent citizen... It may also be the case that the statistical expert is not just an individual who knows how to “think statistically”, but is a person who is fully statistically literate as described by Rumsey. (delMas 2002, p. 4)

Reflecting on the above perspectives, delMas (2002) highlighted a different view on how statistics educators can distinguish the aims of statistical literacy, reasoning and thinking based on their instructional activities.

What moves us from one of the three domains to another is not so much the content, but, rather, what we ask students to do with the content. (delMas 2002, p. 5)

From this perspective, delMas viewed the nature of the assessment tasks as essential to identifying whether instruction promotes these outcomes as illustrated in Table 6.1. To promote the development of *statistical literacy*, instructors can set tasks that ask

... students to identify examples or instances of a term or concept, describe graphs, distributions, and relationships, to rephrase or translate statistical findings, or to interpret the results of a statistical procedure. (delMas 2002, p. 5)

Table 6.1 Assessment tasks that may distinguish the three instructional domains

Basic literacy	Reasoning	Thinking
Identify	Why?	Apply
Describe	How?	Critique
Rephrase	Explain	Evaluate
Translate	(The process)	Generalize
Interpret		
Read		

Source from delMas (2002, p. 6)

and *statistical reasoning* can be developed if we ask

... students to explain why or how results were produced... or why a conclusion is justified[.] (delMas 2002, p. 5)

delMas ultimately believed that *statistical thinking* can be distinguished from the other domains in which we ask

... students to apply their basic literacy and reasoning in context... [and]... is promoted when instruction challenges students to apply their understanding to real world problems, to critique and evaluate the design and conclusions of studies, or to generalize knowledge obtained from classroom examples to new and somewhat novel situation. (delMas 2002, p. 5)

Drawing from delMas's (2002) perspective, Morris (2008) argued that the development of *statistical literacy* is closely related to "lower order skills" whilst the other two domains, *reasoning* and *thinking* seem associated with "higher order skills".

As stated previously, the CAOS test was deemed as a valid measure of important learning outcomes that aligned with the three domains in an introductory statistics subject. Nonetheless, it is also necessary particularly in this study to examine whether the test sufficiently assess those outcomes in comparison to the conventional assessments specifically designed for the subject.

6.3 Methodology

A case study was set as a research design selected for this study. Samples were drawn from two cohorts of undergraduate students involving 132 students in March/Autumn 2010 and 79 students in March/Autumn 2011 who enrolled in an Introductory Statistics subject (STAT131).

As mentioned previously, the CAOS test was considered as an adjunct to the conventional assessments for measuring learning outcomes in an introductory statistics which closely aligned to the collapsed Bloom's taxonomy. The CAOS test therefore was used to assess the students' understanding and learning of statistics in which this was administered twice to the class, once in week 2 (baseline test) and once in week 12 (post-test) of the 13-week session via online tests (refer https://app.gen.umn.edu/artist/user/scale_select.html) using an access code provided by the lecturer. Students were assigned marks worth 2 % of their final marks for completing

the tests that is, they were awarded participation marks of 1 % for each test irrespective of the marks achieved in both tests. No time limit was set, thus the test was taken out of class with students completing in their own time. As soon as all students completed the test, the lecturer could download two reports of students' data, one is a copy of the test with the percentages filled in for each response given by students, and with the correct answers highlighted. The second report is presented in an Excel spread sheet with percentage correct scores for each student.

The CAOS test is an established instrument which could provide valuable information on what students appear to learn and understand on completing a first year level statistics course (delMas et al. 2007). In specific, it can be used to formally assess what the students knew coming into the class, and then to assess them after they had completed the class. The conventional assessments particularly final exam marks and the findings from other studies were included in the analysis in comparison to the test instrument.

6.4 Results and Discussion

To compare the students' performance at the beginning of session between the 2010 and 2011 cohorts, an independent two samples t-test on the CAOS pre-test was used for analysis. The result revealed that no significant difference was found in the average per cent correct ($t_{209}=0.114$, $p=0.910$ with equal variances assumed, $F=0.049$, $p=0.826$) for the CAOS pre-test between the cohorts. That is, there was no difference in the average skills performance at the commencement of the subject (see Table 6.2).

A matched-pairs t-test was used to test for significant learning gains (from pre-test to post-test) within each cohort. The means and standard deviations of the average per cent correct for the CAOS tests were presented in Table 6.3. The table also showed the results from delMas et al.'s (2007) study as to compare the outcomes in different context. In 2010, the students demonstrated significant learning gains throughout session from an average per cent correct of 50 % on the pre-test to an average per cent correct of 54 % on the post-test ($t_{131}=3.634$, $p<0.001$). While statistically significant, this was only a small average increase of 4 percentage points, with a 95 % confidence interval of the difference between 1.8 and 6.2, or

Table 6.2 Average skills performance at the commencement of STAT131 the 2010 and 2011 sessions

Descriptive	Percentages of correct answers	
	March/Autumn 2010 (N=132)	March/Autumn 2011 (N=79)
Average	49.98	49.78
Standard deviation	12.21	13.07
Standard error mean	1.063	1.471

Table 6.3 Changes in overall performance in the CAOS tests between cohorts in comparison to delMas et al.'s (2007) study

	N	Average per cent correct				Difference in average per cent correct	
		Pre-test		Post-test		Mean	S. D. ^a
		Mean	S. D. ^a	Mean	S. D. ^a		
March/Autumn 2010	132	50.0	12.2	54.0	15.3	4.0	12.6
March/Autumn 2011	79	49.8	13.1	51.9	14.3	2.1	11.1
delMas et al. (2007)	763	44.9	^b	54.0	^b	9.1	12.0

^aStandard deviation

^bStandard deviations for the pre and post-test were not available, but the standard deviation of the difference was recorded in delMas et al. (2007)

0.7–2.5 of the 40 items. However, no significant gains or improvement in the average per cent correct from pre-test (50 %) to post-test (52 %) were found in 2011 ($t_{78} = 1.702$, $p = 0.093$).

In different context, an increase of 9 percentage points was evident from delMas et al.'s study ($t_{762} = 20.98$, $p < 0.001$) with a 95 % confidence interval of the difference between 8.2 and 9.9, or 3.3–4.0 of the 40 items. Although this result was slightly better than 2010 and 2011 cohorts, in all cases the students were correct on a little more than half of the items, on average, by the end of the session.

In the literature, the CAOS test had not been used in the Australian context. Nonetheless, Jersky (2010) had used similar test instrument containing 31 multiple-choice type questions accessed from the ARTIST website. This test was administered twice (pre-test and post-test) within a 15-week session to the introductory statistics class at Macquarie University, Australia. Twenty seven voluntary students took both pre-test (in week 1) and post-test (in week 14). The results revealed no significant improvement in the mean scores (from pre-test to post-test) with a mean difference of 4.3. Though this was insignificant, 96 % of the 27 students (except one student) passed the subject. This small insignificant change in scores of 4.3 % is consistent with 4 % change in this study. Jersky (2010) noted,

[r]egardless of the difficulties and challenges that are experienced by secondary or primary teachers in the teaching of statistics, we must all assume that students have acquired at least some statistical knowledge by the time they enter our first-year statistics classes. (p. 1)

In contrast, a one-way ANOVA and Scheffe post-hoc tests were used to examine the differences in means of final marks between the three cohorts (including March/Autumn 2009 cohort however no CAOS test was administered). The result revealed a strong evidence of differences in mean final marks ($F = 10.004$, $p < 0.001$) between the cohorts. In particular, the 2011 cohort attaining significantly higher mean final marks than the 2010 cohort ($p = 0.004$) with a mean difference of 8.2 marks (see Table 6.4).

In regards to examine the association between the post-test and the students' final marks, the findings revealed that there was a significant but weak positive correlation between the post-test performance and final marks for 2010 cohort ($r = 0.380$, $p < 0.001$) and 2011 cohort ($r = 0.260$, $p = 0.006$).

Table 6.4 Comparison of mean final marks between the three cohorts in STAT131

	N	Average marks	Standard deviation
March/Autumn 2011	195	67.93 ^{a,b}	22.38
March/Autumn 2010	191	59.73 ^a	23.84
March/Autumn 2009	89	55.51 ^b	27.66
Total	475	62.30	24.48

^aThe mean difference is significant at $p=0.004$

^bThe mean difference is significant at $p<0.001$

In 2010 and 2011, the students were assigned marks worth 2 % of their final marks for completing the CAOS tests, in other words, they were awarded participation marks of 1 % on each test irrespective of the marks they achieved for both tests. In response to no changes in the average per cent correct on the CAOS tests at the end of session, this might be the reason of, as some students were not completing the tests seriously. Besides, this test was taken out of class where the students completed it in their own time. Hence in this condition, it was recommended that the tests to be taken at least 10 min but not more than 60 min (delMas et al. 2007). According to delMas et al. (2007), the reason was to eliminate the students who did not engage sufficiently with the test items or who spent an excessive amount of time on the test, possibly those who searching for answers. It remains possible that students were not serious or caring in their attempts.

In this study however, nearly one fifth (15.9 %) of the 2010 students and a little over one third (40.5 %) of the 2011 students completed the post-test within less than 10 min meanwhile almost none of them (only one student) took more than 60 min. In accord with delMas et al. (2007), the findings revealed that the students did not successfully complete the test with an average per cent correct less than 35 % when they took less time to complete it. But from another perspective, there was an issue on whether 10 min is an adequate time to complete the test. For this reason, two experts in statistics education area were asked to complete this test. The results showed that both of them were able to complete it between 20 and 30 min with an average per cent correct of 87.5 % and 75 %, respectively. Thus, it was suggested that the students might sufficiently able to complete the test between at least 20 min and not more than 60 min as noted by delMas et al. (2007). Both experts also highlighted some issues particularly on language or the terms used in the tests (Jersky 2010) which might contribute to low performance on the CAOS tests, for instance, item 2, 9, 31, and 37. This suggests for a revision on these four items or perhaps the exclusion of those items in the future assessment.

For a particular item on the post-test, responses to each item were coded as 0 for an incorrect response and 1 for a correct response. For each 40 item assessed, report on the percentage of students who selected a correct response on the post-test was recorded separately for the 2010 and 2011 cohorts, and also the computed p-value of the respective independent two samples t statistics. The independent t-test was used to compare the correct responses for individual items between the cohorts.

Table 6.5 Differences of correct responses on the CAOS post-test by topics between the 2010 and 2011 cohorts

Topic ^a	Total number of items	No significant differences between the 2010 and 2011 cohorts	Cronbach's alpha coefficient (N=211)
1. Data collection and design	4	7, 22*, 24, 38	0.06
2. Descriptive statistics	3	14, 15, 18, 33*	0.33
3. Graphical representations	9	1, 3, 4, 5, 6, 11*, 12*, 13*, 20*, 33*	0.64
4. Boxplots	4	2, 8, 9, 10	0.24
5. Bivariate data	3	20*, 21, 22*, 39	0.32
6. Probability	2	36, 37	0.07
7. Sampling variability	5	16, 17, 32*, 34, 35	0.27
8. Confidence interval	4	28, 29, 30, 31	0.27
9. Test of significance	6	11*, 12*, 13*, 19, 23, 25, 26, 27, 32*, 40	0.48

*Items related to understanding more than one topic

^aCAOS item numbers

In this study, an analysis of individual items was undertaken by topic using the nine major topic groupings as proposed by delMas et al. (2007). According to delMas, some items measuring students' understanding relates to more than one topic (see Table 6.5). The major topics were: data collection and design, descriptive statistics, graphical representations, boxplots, bivariate data, probability, sampling variability, confidence intervals, and tests of significance. Table 6.5 provides a summary of differences of correct responses on the post-test between the 2010 and 2011 cohorts by topics. It was found that one of the four items for which the 2011 cohort performed better than the 2010 cohort was related to boxplots. The item showing poorer performance among the 2011 cohort was related to graphical representations. However as 40 items were undertaken it is quite feasible that these two would be significantly different by chance. That is, 5 % of items are likely to give rise to a type I error. The remaining 38 items were grouped into topics that showed no significant differences on the post-test between the two cohorts. A Cronbach's alpha on each topic that is, treating the items as a scale possibly generate information as to whether all items are reliable. As shown in Table 6.5, based on a sample of 211 students there appeared that all topics produced a Cronbach's alpha coefficient of less than 0.65, and this was below the acceptable level of reliability.

Considering all of the outcomes discussed above, this posed an issue on suitability, validity, and reliability of using the CAOS test to measure students' learning and understanding of statistics specifically in this study. While there are many interesting patterns seen in these results, the author will not discuss or interpret those results in detail as it falls outside the scope of this study.

6.5 Conclusion

In STAT131, when the CAOS post-test revealed no such improvement, it cast some doubt on the efficiency of the test instrument in measuring student learning outcomes in the subject. An examination of all evidence, including the weaker evidence provided by the conventional assessments suggested that, results for the CAOS post-test were anomalous. As previously noted, this could be due to the test being weighted of only 1 % participation marks (regardless of the actual scores) hence the test appeared inappropriate to measure student performance at the end of the session at least with this reward system.

In this study, the CAOS test was also used an external measure to assess student statistical literacy, thinking, and reasoning for the STAT131 both in 2010 and 2011. However there were shortcomings in using this instrument to measure student learning outcomes as there were no significant learning gains in the 2011 cohort though only a small average increase of 4 percentage points in the 2010 cohort at the end of session. Furthermore, students in both cohorts were correct on a little over than half of the 40 items included in the test by the end of session and finding was not dissimilar to other researchers (delMas et al. 2007; Jersky 2010). It appeared that the instrument might possibly need better structure of test items in questioning key aspects of learning on nine major topics. There were issues raised such as the terms used for some items in measuring students' learning and understanding on particular topics, for example, item 2 (boxplots), 9 (boxplots), 31 (confidence interval), and 37 (probability). This suggested that the CAOS test was less adequate in assessing students' statistical literacy, thinking, and reasoning compared to the conventional assessment applied in STAT131 and this was possibly due to the low mark assigned to it and lack of care in completion by many students. This test perhaps be more validly included in the subject if a higher mark was allocated for its completion and it was compulsory for all students. There were also shortcomings in the time limit specified to complete the test and the terms used in some of the items as discussed previously. However before it is increased in value a closer examination of what it measures as compared to the STAT131 desired outcomes is warranted.

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References

- Bullock, J. O. (1994). Literacy in the language of mathematics. *The American Mathematical Monthly*, 101, 735–743.
- Chance, B. (2002). Components of statistical thinking and implications for instruction and assessment. *Journal of Statistics Education*, 10(3). Available at <http://www.amstat.org/publications/jse/v10n3/chance.html>

- Cobb, G. W. (1991). Teaching statistics: More data, less lecturing. *AMSTAT News*, No. 182.
- Cobb, G. W. (1993). Reconsidering statistics education: A national science foundation conference. *Journal of Statistics Education*, 1(1). Available at www.amstat.org/publications/jse/v1n1/cobb.html
- Cobb, G. W., & Moore, D. S. (1997). Mathematics, statistics, and teaching. *The American Mathematical Monthly*, 104(9), 801–821.
- delMas, R. (2002). Statistical literacy, reasoning, and learning: A commentary. *Journal of Statistics Education*, 10(3). Available at http://www.amstat.org/publications/jse/v10n3/delmas_discussion.html
- delMas, R., Garfield, J., Ooms, A., & Chance, B. (2006, April 9). Assessing students' conceptual understanding after a first course in statistics. *Paper presented at the annual meetings of The American Educational Research Association*, San Francisco, CA.
- delMas, R., Garfield, J., Ooms, A., & Chance, B. (2007). Assessing students' conceptual understanding after a first course in statistics. *Statistics Education Research Journal*, 6(2), 28–58. Retrieved from <http://www.stat.auckland.ac.nz/serj>
- Deming, E. (1940). Discussion of Professor Hotelling's paper. *The Annals of Mathematical Statistics*, 11(4), 470–471.
- Garfield, J. (2002). The challenge of developing statistical reasoning. *Journal of Statistics Education*, 10(3). Available at <http://www.amstat.org/publications/jse/v10n3/garfield.html>
- Garfield, J., & Ben-Zvi, D. (2007). How students learn statistics revisited: A current review of research on teaching and learning statistics. *International Statistical Review*, 75(3), 372–396.
- Gould, R. (2010). Statistics and the modern student. *International Statistical Review*, 78(2), 297–315.
- Jersky, B. (2010, December). A case study of knowledge of key statistical concepts before and after an Introductory Statistics class. In H. MacGillivray & B. Phillips (Eds.), *Proceedings of the seventh Australian conference on teaching statistics (OZCOTS 2010)*, Fremantle, Australia.
- Mathews, D., & Clark, J. (2003). *Successful students' conceptions of mean, standard deviation and the central limit theorem*. Available at <http://www1.hollins.edu/faculty/clarkjm/papers.htm>
- Moore, D. S. (1997). New pedagogy and new content: A case of statistics. *International Statistical Review*, 65(2), 123–165.
- Moore, D. S., & Cobb, G. W. (2000). Statistics and mathematics: Tension and cooperation. *The American Mathematical Monthly*, 107(7), 615–630.
- Morris, M. M. (2008). *Evaluating university teaching and learning in an outcome-based model: Replanting bloom*. Unpublished Ph.D. thesis, University of Wollongong, Australia.
- Rumsey, D. J. (2002). Statistical literacy as a goal for introductory statistics courses. *Journal of Statistics Education*, 10(3). Available at <http://www.amstat.org/publications/jse/v10n3/rumsey2.html>
- Wild, C. (1994). Embracing the “wider view” of statistics. *The American Statistician*, 48, 163–171.

Chapter 7

Culturally Responsive Pedagogy: Experience in the Visual Art Education Classroom

Siti Zuraida Maaruf, Muhamad Azhar Abdullah, Saedah Siraj,
and Voviana Zulkifli

Abstract The lack of research references in the approach of a culturally responsive pedagogy in arts education at the global and local level has paved the way for the need to conduct a more comprehensive study in the field. To successfully implement and achieve the aims of an effective multicultural education, emphasis should be placed on several critical actions. It is evident that there is a need to introduce a multicultural responsive pedagogical approach system that provides more room to the element of knowledge and awareness of the diversity of culture to assist teachers in the matter. The research examines the experience of using culturally responsive pedagogy in Visual Art Education. From the survey, results indicated that the module has high potential to be incorporated into the current curriculum as it is a new pedagogical approach that is responsive to multicultural education.

Keywords Art education • Culturally responsive • Pedagogy

S.Z. Maaruf (✉)
Faculty of Education, Universiti Teknologi MARA (UiTM),
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: sitizu610@salam.uitm.edu.my

M.A. Abdullah
Faculty of Film, Theater and Animation, Universiti Teknologi MARA (UiTM),
Campus Puncak Perdana, Shah Alam, Selangor, Malaysia
e-mail: azhar624@puncakalam.uitm.edu.my

S. Siraj
Faculty of Education, University Malaya, Kuala Lumpur, Malaysia
e-mail: saedah@um.edu.my

V. Zulkifli
Independent Researcher, Malaysia
e-mail: vovianawriting@gmail.com

7.1 Introduction

The aim of this research is to develop a Culturally Responsive Pedagogical Module (CRPM) for Visual Art Education (VAE) at the secondary school level. A culturally responsive pedagogy is a teaching and learning approach developed based on the knowledge of culture, and extant experiences that student from multi ethnic backgrounds possess, built upon references and the performance styles of these multiracial students so as to make the learning process more relevant and effective to them. Rasool and Curtis (2000), also Gollnick and Chinn (2009) concluded and asserted that a culturally responsive pedagogical approach is an important fundamental component for a multicultural education. Research in the field of a culturally responsive pedagogical approach is not new. Although researches and critical writings on the approach of a culturally responsive pedagogy are many, they are inclined toward theoretical analyses and researches in the field of language literacy and special education.

Research into a culturally responsive pedagogical approach in arts education is still lacking and in need of more in depth studies. Consequently, the lack of research references in the approach of a culturally responsive pedagogy in arts education at the global level also the lack of research at the local level has paved the way for the need to conduct a more comprehensive study in the field. Hence, it is most appropriate for a study on the development of a culturally responsive Visual Art Education module at the secondary level be conducted in aiding teachers to integrate and to implement a multicultural education in the teaching and learning practices at schools with the aim of enhancing students' knowledge and awareness regarding the elements of art and culture inherited by each race that makes up the multiracial society in Malaysia. It is also hoped that with the existence of this culturally responsive pedagogical module for Visual Art Education at secondary level in Malaysia, there will be an improvement in students' interests and academic achievements consequently making them become more responsive towards their own culture and those of others.

7.2 Background of the Research

Multicultural education has long been an issue globally. Researches and critical writings in the field of multicultural education were first mooted after the break of the Second World War. Banks (2010) elucidated that the outbreak of the Civil Rights Movement was responsible for the introduction of the Multicultural Education in the United States in the 1960s. Among the better known researchers who are still actively pursuing the study and critical writing of multicultural education until today are Banks (1989), Nieto (1992), Banks and Banks (1993), and Grant and Sleeter (1993). To date, the research of multicultural education that broaches into the field of specific curriculum such as language and arts education is gaining

momentum throughout the world that it produces new researchers such as Jacobs (2002), Hatton (2003), Glazier and Seo (2005), Anita Malhotra (2006), Bastos (2006), Gina Martin (2006), Graham (2009) and a host of others.

In Malaysia, the study of multicultural education is receiving more attention from academicians. However, a majority of the researches conducted are set towards theoretical analyses and general perspectives either at the school level or at the level higher learning. These local researches include those conducted by Najeemah (2005, 2008), Raihanah (2009a, b), Abdul Rahim Hamdan et al. (2010), Malakolunthu et al. (2010), Malakolunthu (2011) as well as Abdul Razaq et al. (2011). In his research, Samsudin (2010) used comics as a teaching aid material in Malay language subject which saw the integration of a multicultural education element. Likewise with the research performed by Ahmad Ali et al. (2010) pertaining to the effectiveness of a multicultural approach in the national integration of history subject. Badrul Isa (2006) included the issue of multicultural education within the context of Visual Art education in Malaysia but once again, the consideration that he put forth was limited to theoretical analysis and general perspective only. These researchers feel that the time is ripe to venture into the need to focus and establish a research in the application of theory in teaching and learning practices in schools.

As such, the research in the development of a Culturally Responsive Pedagogical Module for Visual Art Education for secondary school is not only important but meets current requirements in the Malaysia setting. This pedagogical module will provide the opportunity for a diversity of cultures to be exposed to students by improving and purifying the Visual Art Education curriculum. Through this culturally responsive teaching, teachers are able to teach Visual Art Education while incorporating elements of culture or art from the Indian or Chinese communities in a Malay handicraft lesson, for example. This way, students indirectly learn art in a comprehensive manner as it encompasses every race from the context of history, medium or motive employed by certain races. This classroom process may be able to inculcate sensitivity and tolerance among students of different backgrounds and cultures.

7.3 Research Problem

UNESCO (2010) advocates a school curriculum that is based on the principle of equality and to ensure that student's combat discrimination and stereotyping involved in the development of multicultural education in a learning environment. Current researches in the field of multicultural education show that multicultural curriculum strategy that emphasizes a holistic approach encourages students to achieve better (Bank and Bank 2004; Pang 2004).

The research conducted by Najeemah (2005) shows that the practice of multicultural education among teachers in Malaysia is not to the desirable level. The teachers involved in the research adduced four reasons for their lack in practising multicultural education in schools. Firstly, teachers do not know or do not understand

as to what constitutes a multicultural education. Secondly, teachers lack the knowledge in applying the pedagogical approach relating to an effective multicultural education. Thirdly, teachers do not receive any encouragement to learn about a pedagogical approach that leads to multicultural education. Fourthly, teachers lack the awareness of their full responsibility as educators to prompt them in utilizing a pedagogical approach relating to an effective multicultural education. The research carried out by Abdul Razaq et al. (2011) also suggested that the Ministry of Education Malaysia (MOE) seeks a mechanism to improve on the degree of acceptance toward the issue of diversity in schools among teachers in order to ensure that the quality of education is one that is free from any form of prejudice toward any race in Malaysia. Malakolunthu (2011) is of the opinion that to successfully implement and achieve the aim of an effective multicultural education, emphasis should be placed on several critical actions which include the aspect of developing the professional teacher, the development of the curriculum framework, the pedagogy strategy, teaching materials and textbooks as well as the evaluation process.

It is evident that there is a need to introduce a multicultural responsive pedagogical approach system that provides more room to the element of knowledge and awareness of the diverse culture to assist teachers in the matter. Additionally, this module will create the opportunity for the sharing of knowledge to students for them to become more sensitive to the practice of culture of the society around them. This is in tandem with what was proposed by Mitchell (2009) that specific exercises will help teachers to generate understanding regarding the diversity of culture in the minds of students. Subsequently, students need to be exposed not only to the recognition of various cultures, also to look for similarities that exist in their respective diverse cultures. This will prevent them from being culture-illiterate or turning into an ethno-centric group. One of the aspects that need to be given attention to is the art that the multiracial society in Malaysia possesses which is shaped through their cultural practice. Martin (2006) stressed that art plays a major role in a multicultural education as it inherently exists in the context of any culture. Hence, it is imperative for the young generation to have an awareness of the cultures of Malaysia society with a high degree of aesthetic value, subsequently to possess imaginative, critical, innovative and creative minds. Art can be one of the ways or tools to build and strengthen a harmonious and integrated society that is culturally responsive.

In this context, the curriculum for Visual Art education needs a revamp that is compelling to multicultural standing to remain relevant with current requirements. This is in keeping with the proposal by Bates (2000) that Art Education should be multicultural in nature encompassing all segments of society. A curriculum need not be created to cater to every ethnic group and a curriculum also need not be concentrated on a majority ethnic group either. Md. Nasir Ibrahim and Ibrahima Hassan (2003) averred that the diversity of culture should be given due consideration as the main objective in art education. It can be safely affirmed that art is not necessarily confined to a particular race or community alone. This is because art education should serve as a passage that enables all to know, to learn, to comprehend and consequently to appreciate the culture belonging to the entire Malaysian society specifically and the global community generally in accordance with how multicultural art is defined.

Visual Art Education is a subject found in the education system curriculum in Malaysia that is introduced as early as at the pre-school level right until the secondary school level. Visual Art Education is an area of art that focuses solely on visual art and does not include other art forms such as music, dance and martial art as outlined in the Secondary School Education Syllabus (Description of Visual Art Education Syllabus 2002). The Visual Art Education curriculum covers visual communication, design industry and traditional craft. Visual Art Education incorporates the process of creating artworks from the perspective of understanding and a high degree of critique of aesthetic value and individual creativity. This subject combines theory and practice to assist students become more creative, more aware and more sensitive of their environment. Referring to the existing Description of Visual Art Education Syllabus (2002), particularly the craft component, it focuses on the handicraft of the Malay society and those of ethnic natives only. Therefore, to remain impartial it is most appropriate to provide the same opportunity to every individual student to learn and to explore this diversity of crafts. For instance, a Chinese student may learn to understand and thereby respects the artistic value found in the handicrafts of the Malay and Indian communities, and vice versa. If the curriculum is centred on a particular dominant race only, it will be more difficult for the efforts promoting integration, sensitivity and tolerance among multiracial students to be realized. This will also contribute to the difficulty in process of knowledge sharing relating to the similarities in the element of art in a diverse culture as aspired by the National Education Philosophy.

Inopportunately, there are constraints from the aspect of reference materials such as books and articles that touch on the culture of Malaysian society particularly on other than the Malay society like the Chinese, Indian and Indigenous groups as well as the various tribes from Sabah and Sarawak. Lacking the sources for reference with regard to other cultures and heritage arts have resulted in the lack of knowledge and awareness of their customs. This makes learning and understanding the essence of these groups' customs and community arts difficult for every strata of society. It is possible that these materials are written in that particular society's languages like the Chinese or Indian languages, and that these materials are not published for public reference. It is of utmost importance for all to own these reference materials on the subject matter of customs and community arts for the sake of teaching and learning. These references could be the key for the young generation to empower them with knowledge about their own community and others so that they will not be counted as a generation that is ignorant of their own culture. Moncrief (2007) stated that this condition may give rise to certain segment of society to be 'blind' to the effects of culture when there exists a dominant culture in a society as what happened to the dominant Euro-Americans.

7.4 Research Objective

The aim of this research is to examine the experiences of teachers during the conduct of a culturally responsive pedagogical module for Visual Art Education for secondary schools applying the multimedia interactive teaching aid material that has been developed.

7.5 Implementation and Evaluation

The study will examine the perceptions of teachers regarding the application of a Culturally Responsive Pedagogical Module in Visual Art Education for secondary schools and interactive multimedia teaching material in their teaching and learning. Consequently, data will be used to identify the barriers faced by teachers and students during the application of a Culturally Responsive Pedagogical Module in Visual Art Education for secondary schools and interactive multimedia teaching material for the purpose of improving the module.

7.6 Methodology

This research applies the Design and Development of Research approach (Richey and Klein 2007) that focuses on the processes of developing a Culturally Responsive Pedagogical Module through the subject of Visual Art Education at secondary schools. The present study takes up the survey method to gather the feedbacks from the teachers who apply the designed module of a culturally responsive pedagogy.

7.7 Interview

To identify the benefits and effectiveness as well as the weaknesses of the module, in addition to understanding the experience of the teachers conducting the teaching and learning process by using the Culturally Responsive Pedagogical Module for Traditional Craft in Visual Art Education for secondary schools and the interactive multimedia teaching material that has been developed for improvement purposes, the researcher has elected to use interview in the research approach.

Furthermore, the researcher would also wish to discover the barriers or challenges faced by teachers while conducting the teaching and learning process through the use of a culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools and the interactive multimedia teaching material that has been developed. For the purpose of accumulating data, researchers will carry out an in-depth interview on teachers who use the pedagogical module that this has been developed. The rationale behind the choice of interview as the approach for the research by taking into account several aspects and characteristics of qualitative research as stated by McMillan (2008) and Creswell (2009) are as follows:

- (i) Exploration of an Issue or Problem
- (ii) Rich Narratives Descriptions
- (iii) New Perspective
- (iv) Natural Setting
- (v) Researcher as Key Instrument

- (vi) Multiple Sources of Data
- (vii) Inductive Data Analysis
- (viii) Participants Meanings
- (ix) Emergent Design
- (x) Theoretical Lens
- (xi) Interpretive Inquiry
- (xii) Holistic Account.

7.8 Research Participants

Research participants in Phase 3: Implementation and Evaluation are selected using the Purposive Sampling approach in view of the fact that the research participants are teachers and students who are undergoing the process of teaching and learning applying the culturally responsive pedagogical module for Visual Art Education in secondary schools and the interactive multimedia teaching material. In this research, the participants chosen were two experienced teachers of Visual Art Education subject in a national secondary school. The selection of research participants were also motivated by several factors which include:

- (i) Background of the subject taught
- (ii) Teachers' experience in teaching the VAE subject
- (iii) Teachers' experience in using a culturally responsive pedagogical module for Visual Art Education in Secondary schools.

Table 7.1 highlights the matrix for phase 3.

7.9 Findings

7.9.1 *Analysis of the Interview on Two Visual Art Education Teachers Who Teach Using the Module*

This section discusses and describes the research findings of the whole collection process for the fourth data namely the evaluation of the usefulness of the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools based on the qualitative technique applied on teachers and students involved in the teaching and learning process utilising this module. The

Table 7.1 Matrix for phase 3 research: implementation and evaluation

Research participant	Number (N)	Sampling approach	Research approach
Teacher interview	2	Purposive sampling	In-depth

evaluation analysis of the usefulness of the module in this research is for the purpose of distinguishing the perceptions of teachers and students toward the usefulness of the culturally responsive pedagogical module for Visual Art Education in secondary schools in their teaching and learning. Apart for that, researchers also wish to identify the barriers faced by teachers and students while using the culturally responsive pedagogical module for Visual Art Education in secondary schools with the aim to improve the module.

The research findings in this section are divided into two parts. In Part A, researchers analysed the research findings in the qualitative form by way of the interview approach on 2 Visual Art Education teachers who were chosen through the sampling method for the purpose of teaching the module. The results will discuss the research findings analysis based on the following research question as well as several arising issues or emerging data from the interview conducted:

- (i) What is the perception of teachers toward the usefulness of the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools in their teaching and learning process?

The discussion on the analysis of the findings from the interview with the Visual Art Education teachers will be performed according to the views and experience of teachers on the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools.

7.9.2 Views and Experience of Teachers Toward the Culturally Responsive Pedagogical Module for Traditional Craft in Visual Art Education for Secondary Schools

The research finding discussed in this section was based on the analysis of the interview transcription conducted on both the Visual Art Education teachers chosen through the purposive sampling approach whereby the Visual Art Education teachers were involved in the teaching of the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools developed by the researcher. For a more in-depth discussion regarding the teachers' perception on the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools that has been developed, the researcher performed the analysis based on the following themes:

- New experience and knowledge
- High potential for module to be integrated in the current curriculum
- New pedagogical approach that is responsive to a multicultural education
- New approach to apply good values across the curriculum

7.9.2.1 New Experience and Knowledge

Overall, both teachers gave highly positive responses regarding their experience in handling a culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools and the presentation of the interactive multi-media teaching material. This is evident from what was stated by one of the teachers:

Teacher A stated that:

As for me madam ...so enjoyable *lah*my experience aaa.... Teaching the module is a new experience because the subject aaaa.....I have never taught this subject before except *tekad*. Aaaa I mean those Chinese and Indian craft activities that I myself had not learned before this If like ah..... observe what Indian embroideryis aaaa..... and that lantern, never before whether at school during practicum a long time ago or in the art and art design programs at the Education Faculty at UiTM before as for meaaaa.....
(L31-37:Respondent 1:22 Okt 2012)

He added:

even as a teacher I myself was excited....when teaching this module I myself had fun learning how to make a lantern with Indian embroidery further ... I learned many new facts like its historyto me, when there is a module like this teachers will automatically become more responsive and aware of the cultures among students(L171-175:Respondent 1:22 Okt 2012)

Furthermore, Cikgu R said:

even for me myself more homework on Chinese and Indian cultures before teaching this module ... afraid that students will not understand ... so I myself must be fully familiar with the craft to be taught then I realized actually there are much that we do not know about the customs of other people or races ... so, as teachers ... we should learn more about crafts ... other races' culture ... because we are ignorant of all theseI think we can become closer with our students that sounds fun when we can share with our students ... I noticed when I talked about the crafts of other races students become more comfortable to interact with me as if they are not shy or intimidated by us ... it gives them the impression that we are more sensitive and concerned about their culture .. not just the culture of the Malays only (L176-187:Respondentt 2:22 Okt 2012)

7.9.2.2 High Potential of Module to Be Integrated into the Current Curriculum

Both teachers asserted that this culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools that has been developed is extremely suitable to be integrated into the Visual Art Education curriculum since the existing curriculum only emphasizes on the crafts of the Malays only. Below are the statements from both teachers:

Teacher A stated that:

it is a good approach because it exposes urm what do you call it ... the diversity of culture of the Malaysian Malay, Chinese and Indian and also the Bumiputra to be learned together in the context of the given module lah ... aaaa....further actually students also don't know about the crafts of other races....lah (L37-42:Respondent 1:22 Okt 2012)

Additionally, Teacher R stated:

my opinion ah..... like this ah.....this Culturally Responsive Craft module is actually very suitable for schools because we know even in schools there are a diversity of Malay Chinese Indian cultures so..aaaaa..... mostly if we look at the art education syllabus um..... much is emphasized on the Malay traditional craft all like us um..... like this module there is *tekad* um..... and then handicrafts ah..... Chines Indian so from there we ah..... indirectly learn ah..... very ah..... interesting ah..... the activities are very interesting lah. I think puan ... it is time ... our psv .aaa.....hasnew things like this modulethen only students become more interested to learn (L44-53:Respondent 2:22 Okt 2012)

She added:

This module is very suitable for VAE curriculum in my opinion we and Malaysia have diverse cultures ... they will learn the cultural crafts of every ethnicity la (L390-392:Respondent 2:22 Okt 2012)

7.9.2.3 New Pedagogical Approach that Is Responsive to Multicultural Education

Both teachers opined that this culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools that has been developed is a novel teaching approach that can assist teachers in the integration of the elements of multicultural education over the existing curriculum in tandem with the aspiration of 1Malaysia. According to them:

Teacher R stated:

this module is timely aren't we now embracing the concept of 1Malaysia..... by right all these students have already learned or we must expose about the traditional craft of all races (L145-148:Respondent 2:22 Okt 2012)

Teacher A explained:

As a teacher I myself was excited when teaching this module I myself had fun learning how to make a lantern using Indian embroidery ... furthermore I learn many new facts, for example its history to me when there is a module like this teachers will automatically be more responsive and sensitive to the cultures that exist among the students (L171-175:Respondent 1:22 Okt 2012)

Teacher A added:

The learning outcome from this module is effective on the students because.... now there is the 1Malaysia concept its like we are strengthening that concept of 1Malaysia lah. Meaning the education transformation happens indirectly, based on culture..... I totally agree if this module can be integrated into the existing PSV curriculum today.... Reallythis

culturally responsive module isone.....product-based teaching and learning process that is considered ... this is really a culture (L354-360:Respondent 1:22 Okt 2012)

7.9.2.4 Improvement on the Existing Visual Art Education Curriculum

Both teachers expressed their views that the culturally responsive pedagogical module for traditional crafts in Visual Art Education for secondary schools that was developed can be combined into the existing Visual Art Education curriculum component such as in the creation of sculptures, paintings and the likes. Below are the statements of both teachers:

Teacher A suggested that:

Actually if we look again at the crafts in Malaysiaaaaa..... there are many similarities for example ceramic, Sabah Sarawak have it, India has it so we can improve further example *tekat*. We can insert Indian embroidery element into our *tekat* (L393-396:Respondent 1:22 Okt 2012)

He added:

adding content in the form of activities to create multicultural crafts ... to get the culture integration ... apart from the existing syllabus lah (L399-401:Respondent 1:22 Okt 2012)

.....actually this multicultural integration can easily be inserted if we want to, into thethe existing PSV syllabus contentOnly that many teachers are not clear ...don't know what to dobut when there is a module like this weare a bit clearercan understand how to teach the craft element from the culture of other races (L404-408:Respondent 1:22 Okt 2012)

Meanwhile, Teacher R said:

To me.....we can insert the activities of this module into the VAE sub-topics Like the lantern can be included into the scope of sculpture ...mobile sculpture..... (L402-403:Respondent 2:22 Okt 2012)

7.9.2.5 New Approach in the Application of Good Values Across Curriculum

Both teachers asserted that the existence of such a module will greatly assist in the application of good values through the process of teaching and learning. Below are their responses:

Teacher R said that:

we must expose the traditional crafts of all races ... then only will they ... what is it have tolerance and understanding .. to me if we were to look at when the students were following this module they appeared more cooperativeha.... with this kind of moduleI think the effort to apply values in teaching and learning will become clearer (L147-152:Respondent 2:22 Okt 2012)

Teacher A added that:

This module not only gives space for students to learn something new in crafts but they also have the chance to share their opinions and experiences... (*L152-154:Respondent 1:22 Okt 2012*)

He further said:

I noticed when I was in the appreciation set.....when I called the students Commented on the crafts they were making there were many responses from the students whether Chinese or Indianall had opinions to shareI also noticed during the group activity to make the lantern there were Malay students asking their friends about mooncakes ... why the Chinese play with lanterns ... all those things....showing cultural responsivenessmeaningstudents have the desire to knowabout the culture of other races (*L156-163:Respondent 1:22 Okt 2012*)

7.10 Conclusion

From the context of this research, the outcome of the semi-structured interviews on two Visual Art Education teachers who employed this module and the analysis of the open answers from the students' questionnaires showed that generally, the teachers who participated in the process of teaching and learning based on the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools strongly supported for this module to be integrated into the current existing Visual Art Education curriculum. The findings from the semi-structured interviews on the two Visual Art Education teachers who taught this module and the analysis of the open answers from the students' questionnaires showed that the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools and the presentation of the interactive multimedia teaching material have acknowledged that this module is able to provide a new teaching and learning experience. This is consistent with the research findings of Kampouroupoulou et al. (2011) who recorded encouraging opinions from students in their research. Those students were of the opinion that technology had given them very helpful opportunity in the production of new art products and had speeded up the production process. The researcher also succeeded in discovering that the use of technology was very beneficial for the design of art products and for initiating the development of aesthetic value in art products.

The research findings also indicated that the module has high potential to be incorporated into the current curriculum as it is a new pedagogical approach that is responsive to multicultural education. The findings of this research also support the research findings of Da Silva and Lopes (2006) who found that the use of art-based education from different cultures promoted the development of a healthy attitude among students toward cultures different from theirs. Additionally, the teachers felt that the existence of this module enables improvement toward the existing Visual Art Education curriculum to be carried out and that it introduces a new approach for

the application of good values across the curriculum. The research findings also support the latest research of Mamur (2012) where trainee teachers of Visual Art Education who took part in his research relating to the perception of the dialogue in a cultural art visual among trainee teachers succeeded in expanding their inquisitive attitude toward the content of this subject. On top of that, they applied this development of attitude to compose meaning for the art work created. These trainee teachers also widened their experience by generating new information from experiences as well as the people around them.

The findings with regard to the present five themes have also distinguished the strengths and weaknesses of a culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools as well as the presentation of the interactive multimedia teaching material. Among the opinions offered by the teachers was that the culturally responsive pedagogical module for traditional craft in Visual Art Education for secondary schools managed to arouse the interest of students to enquire and to learn a multicultural element of crafts and that it was easy to follow.

References

- Abdul Rahim Hamdan, & Mohd Najib Ghafar dan Anis Ayuni. (2010). *Fostering inter group contacts among multiracial students*. http://wtfaculty.wtamu.edu/webres/File/Journals/MCJ/Volume5-1/hamdan_ghafar_ghani.pdf
- Abdul Razaq Ahmad, Norhasni Zainal Abiddin, Zalizan Mohd. Jelas, & Saleha, A. (2011). Teachers' perspectives towards schools diversity in Malaysia. *International Journal of Business and Social Science*, 2(4), 178–189.
- Ali, A., & Zahara Dan Abdul Razaq. (2010). *keberkesanan pendekatan berasaskan kepelbagaian budaya terhadap integrasi nasional dalam mata pelajaran sejarah*. Prosiding Seminar Penyelidikan Siswazah Ukm Jilid 3, Fakulti Pendidikan, Universiti Kebangsaan, Malaysia.
- Banks, J. (1989). Integrating the curriculum with ethnic content. In J. A. Banks (Ed.), *Multicultural education*. New York: Praeger.
- Banks, J. (2010). *Multicultural education: Issues and perspectives* (7th ed.). Hoboken: Wiley.
- Banks, J. A., & Banks, C. A. M. (1993). *Multicultural education: Issues and perspective*. Boston: Allyn & Bacon.
- Banks, J. A., & Banks, C. A. M. (Eds.). (2004). *Handbook of research on multicultural education* (2nd ed.). San Francisco: Jossey-Bass.
- Bastos, F. (2006). Border-crossing dialogues: Engaging art education students in cultural research. *Art Education*, 59(9), 20–24.
- Bates, J. K. (2000). *Becoming art teacher*. Wadsworth: Belmont.
- Creswell, J. W. (2009). *Third edition research design: Qualitative, quantitative and mixed method approaches*. Thousand Oaks: Sage Publication, Inc.
- Da Silva, J. P., & Lopes Villas-Boas, M. A. (2006). Promoting intercultural education through art education. *Intercultural Education*, 1(1), 95–103.
- Description of Visual Art Education Syllabus. (2002). *Huraian Sukatan Pelajaran Pendidikan Seni Visual KBSM*. Kuala Lumpur: Pusat Perkembangan Kurikulum, Kementerian Pendidikan Malaysia.
- Glazier, J., & Seo, J. A. (2005). Multicultural literature and discussion as mirror and window? *Journal of Adolescent and Adult Literacy*, 48(8), 686–700.

- Gollnick, D. M., & Chinn, P. C. (2009). *Multicultural education in a pluralistic society* (8th ed.). Upper Saddle River: Pearson Education, Inc.
- Graham, M. (2009). The power of art in multicultural education: The international stories project. *Multicultural Perspectives*, 11(3), 155–161.
- Grant, C., & Sleeter, C. (1993). *Making choices for multicultural education*. New York: Merrill.
- Hatton, K. (2003, December). Multiculturalism: Narrowing the gaps in art education. *Race, Ethnicity and Education*, 6(4), 357–372. Routledge. Available from: Taylor & Francis, Ltd. 325 Chestnut Street Suite 800, Philadelphia, PA 19106. Retrieved from <http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/13613320332000146375>
- Isa, B. (2006). *Multiculturalism in art education: A Malaysian perspective*. Retrieved November 12, 2009, http://portal.unesco.org/culture/en/ev.phpURL_ID=29639&URL_DO=DO_TOPIC&URL_SECTION=201.html
- Jacobs, W. (2002). Learning and living difference that makes a difference: Postmodern theory and multicultural education. *Multicultural Education*, 9(4), 2–10.
- Kampouroupolou, M., Fokiali, P., Athanasiadis, I., & Stefanos, E. (2011). Teaching art using technology: The views of high school students in Greece. *Review of European Studies*, 3(2), 98–109.
- Malakolunthu, S. (2011). Multicultural education as a reform initiative: Alignment of critical domain. *Journal of Education*, 3(01). <http://journal.uny.ac.id/index.php/joe/article/view/486>
- Malakolunthu, S., Siraj, S., & Rengasamy, N. C. (2010). Multi-cultural education as a reform initiative: Reconstructing teacher preparation for Malaysian “Vision Schools”. *The Asia-Pacific Researcher*, 19(3), 453–464.
- Malhotra, A. (2006). *Collegiate and cultural diversity: A global language arts perspective*. Tesis Sarjana Kedokteran, Capella University.
- Mamur, N. (2012). Perceptions concerning visual culture dialogues of visual art pre-service teachers. *Educational Sciences: Theory & Practice*, 12(31), 2166–2173.
- Martin, G. (2006). *Teaching appreciation of cultural differences through multicultural art education*. A Master Degree thesis from the Empire State College, State University of New York. Retrieved from proquest:umi.com/pqdlink?Ver=1&Exp=07-04-2016&FMT=7&DID=1203549511&RQT=309&attempt=18cf
- McMillan, J. H. (2008). *Educational research: Fundamentals for the consumer* (5th ed.). New York: Pearson Education, Inc.
- Md Nasir Ibrahim dan Ibrahah Hassan. (2003). *Pendidikan Seni Untuk Maktab & Universiti*. Pahang: PTS Publication & Distributors Sdn. Bhd.
- Mitchell, L. A. (2009). *Becoming culturally responsive teachers in today's diverse classrooms*. University of Houston. Retrieved from http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/44/d5/ec.pdf
- Moncrief, A. K. (2007). *Confronting culture blindness: An examination of culturally responsible art therapy*. Online published Master thesis from Florida State University College of Visual Arts, Theatre & Dance. [http://etd.lib.fsu.edu/theses/available/etd-04062007185707/unrestricted/akm_thesis1\[1\].pdf](http://etd.lib.fsu.edu/theses/available/etd-04062007185707/unrestricted/akm_thesis1[1].pdf)
- Najeemah Mohd Yusof. (2005). Multicultural education practice among teachers in national secondary schools: A case study in Kedah. *Malaysian Journal of Educators and Education*, 20, 97–111.
- Najeemah Mohd Yusof. (2008). Multicultural education: Managing diversity in Malaysia. *Malaysian Education Deans' Council Journal*, 2, 65–70.
- Nieto, S. (1992). *Affirming diversity: The sociopolitical context of multicultural education*. New York: Longman.
- Nieto, S. (2004). *Affirming diversity: The sociopolitical context of multicultural education*. Kuala (4th ed.). Boston: Pearson.
- Pang, V. O. (2004). *Multicultural education: A caring centered reflective approach*. New York: McGraw Hill Higher Education.
- Raihanah, M. M. (2009a). Malaysia and the author: Face-to-face with the challenges of multiculturalism. *International Journal of Asia Pasific*, 5, 43–63.

- Raihanah, M. M. (2009b). Multiculturalism and the politic of expression: An appraisal. *European Journal of Social Sciences*, 7(3), 63–70.
- Rasool, J. A., & Curtis, A. C. (2000). *Multicultural education in middle and secondary classrooms*. Belmont: Wadsworth-Thomson Learning.
- Richey, R. C., & Klein, J. D. (2007). *Design and development research: Method, strategies, and issues*. London: Erlbaum.
- Suhaili, S. (2010, November 23–24). *Pendidikan Pelbagai Budaya: Komik Mat Som Sebagai Bahan Bantu Mengajar*. Kertas Pembentangan. Persidangan Antarabangsa Minoriti dan Majoriti: Bahasa, Budaya dan Identiti. Kuching, Sarawak. <http://www.mymla.org/ficmm2010>
- UNESCO. (2010). *Global report on adult learning and education*. © UNESCO Institute for Lifelong Learning. Hamburg, Germany. http://www.unesco.org/fileadmin/MULTIMEDIA/INSTITUTES/UII/confintea/pdf/GRALE/grale_en.pdf

Chapter 8

Prevalence Rate of Dyscalculia According to Gender and School Location in Sabah, Malaysia

Wong Ken Keong, Vincent Pang, Chin Kin Eng, and Tan Choon Keong

Abstract Dyscalculia is a specific mathematics learning disability that affects 6 % of the population (Wilson AJ, Dyscalculia: why do numbers make no sense to some people? Retrieved on 1 Dec 2012, from www.aboutdyscalculia.org, 2008). The findings of (Devine A, Soltész F, Nobes A, Goswami U, Szucs D, *Learn Instruct* 27:31–39, 2013) and (Karimi S, *Math Educ Trend Res* 2013:1–7, 2013) confirmed that the prevalence of developmental dyscalculia was the same for girls and boys. These findings contrast with the studies of (Jovanović G, Jovanović Z, Banković-Gajić J, Nikolić A, Svetozarević S, Ignjatović-Ristić D, *Psychiatr Danub* 25(2):170–174, 2013) and (Gifford S, Rockcliffe F, *Proc Br Soc Res Learn Math* 28(1):21–27, 2008), found that the difference between boys and girls was statistically significant. Reigosa-Crespo et al. (2012) reported that the prevalence of developmental dyscalculia was 3.4 % and the male to female ratio was 4:1. In another case, Koumoula A, Tsironi V, Stamouli V, Bardani I, Siapati S, Graham A et al, *J Learn Disabil* 37:377–388, 2004 found that the prevalence of developmental dyscalculia among rural students is higher than in urban schools. A contradictory findings of Nojabae S, Arab *J Bus Manag* 3(5):50–59, 2014 show that the mathematics disability rate of prevalence is 1.49 % in urban areas and 1.57 % in rural ones, and there is no difference between urban and rural students in different levels due to mathematics disability. This research intends to identify the prevalence of dyscalculia according to gender and school location among LINUS students in Sabah, Malaysia. The results show that there is no significant gender difference in prevalence rates of dyscalculia, but there is a significant difference between LINUS students in urban and rural school.

Keywords Prevalence • Dyscalculia • Learning disability

W. Ken Keong (✉) • C. Kin Eng • T. Choon Keong
Faculty of Psychology and Education, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia
e-mail: kenkeong79@yahoo.com

V. Pang
Centre for the Promotion of Knowledge and Language Learning, Universiti Malaysia Sabah, Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia

8.1 Introduction

The prefix *dys* comes from the Greek and means “badly”. *Calculia* comes from the Latin word *calcularre*; meaning “to count”. More specifically, the term *calcularre* refers to the ability to represent and manipulate numerical magnitude nonverbally on an internal number line (Jenson 2010). Pupils with disabilities may have difficulty performing mathematical calculations; having trouble knowing how to respond to the mathematical information, confusion of symbols and names, read and write mathematical symbols wrongly (Farrell 2009). In England, ‘dyscalculia’ has been defined as ‘the condition that affects the ability to acquire mathematical skills’. Dyscalculia is a term most commonly used for the disabled in Mathematics. Dyscalculia means severe or complete inability to count (Hallahan et al. 2005). Dyscalculia is a term that means “specific learning disability in mathematics” (Newman 1998).

The prevalence of learning disabilities among school children varies from country to country. It is largely dependent on the definition used to classify learning disabled children in each country. There are nearly three million students in the United States that are identified with specific learning disabilities who are receiving special education services. It affected about 5.5 % of the students in school (ages 6–17) for special education because of learning disabilities (Teoh and Lim 2007). In a study conducted by Komoula et al. (2004) of 240 Greek students between the ages of 7–11 from rural and urban areas, they have found that the prevalence of developmental dyscalculia among rural students was higher than in urban schools. Therefore, specific learning disability that is prevalent in other countries, and perhaps is especially more common among rural area students.

In Asian countries, the National Statistical Office of Thailand in 1991 reported a prevalence rate of 1.9 % of visual impairment, 5.4 % of speech impairment, 13.2 % of hearing impairment and 10 % of intellectual disability. In Malaysia, the Department of Special Education in 2002 reported 14,535 children with learning disabilities in 700 schools across the country. These statistics included children who have learning disabilities, hearing impairment and visual impairment in special schools or integrated schools (Teoh et al. 2008).

8.2 Literature Review

Geary (2004) found that between 5 and 8 % of children in school age have some form of disability in mathematics. These figures are confirmed in different countries by a number of researchers. Voutsina and Qaimah Ismail (2007) find a prevalence of 5 % in the South England study. Fuchs (2006) studies report prevalence rates between 4 and 7 %, Belgium researchers find prevalence between 3 and 8 % (Desoete et al. 2004), and Flanagan and Alfonso (2011) in a survey of recent work of authors find prevalence of 7 %.

As a finding of Ramjee’s (2003) study suggests that girls are more learning disability than boys, it may be due to the reasons that the girls have to do more work at home than boys, due to the parents’ negative behavior to them. A contrary finding

of Reigosa-Crespo et al. (2011) found that basic numerical deficits affect 3.4 % of the school – aged population and affect more boys than girls. However, Gifford and Rockliffe (2008) found that dyscalculia is unusually affecting equal numbers of boys and girls. It is obvious that better teaching helps in reduction of learning disabilities. Although there area number of individuals dyscalculia are quite similar in terms of gender, Adler (2008) has been found with his experience that gender comparison study in dyscalculia is very less. However, if there is, they both are often treated in a “lump” together with students with other mathematical difficulties.

Jovanovic et al. (2013) found that the difference of dyscalculia between boys and girls to the total score on the test was statistically significant. This finding is supported by Devine et al. (2013), stated that the prevalence of developmental dyscalculia according to gender was significantly different when using a mathematical-reading discrepancy definition. The ratio of dyscalculia between male and female was 4:1 (Reigosa-Crespo et al. 2011). However, Karimi (2013) and Nilesh Shah and Tushar Bhat (2008) have claimed that the prevalence of dyscalculia in the school-aged population is as common in girls as in boys.

For findings related to the school location, Nojabae (2014) found that the mathematics disability rate of prevalence among elementary students was 1.52 %, and there is no difference between urban and rural students in different levels due to mathematics disability. In a study conducted by Komoula et al. (2004) of 240 Greek students between the ages of 7–11 years from rural and urban areas, he found that the prevalence of developmental dyscalculia among rural students is higher than in urban schools. However, there were no differences between genders in arithmetical performance.

8.3 Methods and Procedures

This study involved the quantitative research design and intended to identify the prevalence of dyscalculia among LINUS students in Sabah, according to their gender and school location. At the end of the study, the researchers would identify the prevalence of dyscalculia among students and provide information on whether they have significant differences in gender and school location.

8.3.1 Instrument

The Malaysian Dyscalculia Instrument Plus (MDI+) is a computer application that used to measure four variables, that including Simple Reaction Time, Short Term Memory, Numerosity and Arithmetics (Chin et al. 2014). MDI, a subset of MDI+, is an instrument used to measure a numerosity ability, which consists of four constructs namely number sense, matching items, dot enumeration and number comparison (see Table 8.1). The MDI that was developed by Chin et al. (2014) has been used to identify the students who suffered from dyscalculia. This instrument, which

Table 8.1 Constructs of Malaysian dyscalculia instrument plus (Chin et al. 2014)

No.	Construct	Description of items	Capacity/Test
1	Simple reaction time	10 items for the left	Response time
		10 items for the right	
2	Short term memory	10 items	Short term memory
3	Numerosity		
	(a) Number sense	10 items	Sense of numerosity
	(b) Matching items	10 items	Numerosity as a property of sets
	(c) Dot enumeration	10 items	Enumeration (counting)
	(d) Number comparison	10 items	Sense of ordered numerosities
4	Arithmetic test	10 items	Arithmetic

Table 8.2 Demography of respondents

Region of Sabah	Sample size
North-West	88
South-West	112
East	161
Rural	87
Total	448

is a computer-based assessment system for children, aims to identify the characteristics of dyscalculia by measuring response accuracy and response time to test items. In addition, MDI+ distinguishes between low mathematics achievement and specific learning difficulties in assessing an individual’s ability and understanding of numbers size, simple addition and simple subtraction.

8.3.2 Population and Sample

This study population consisted of all LINUS students of the primary schools in Sabah. The population was chosen because of the low achievement in public examination of Sabah primary school students, especially in the mathematics subject; and the basic numeracy skill of 92.51 % reported after three screenings of LINUS numeracy test, which was still below LINUS numeracy target of 95 % (Prime Minister’s Department 2011). LINUS is an abbreviation of Literacy and Numeracy Screening (Nazariyah Bint Sani & Abdul Rahman bin Idris 2013).

The cluster sampling was employed as the main sampling method in this study. The reason of cluster sampling is cost efficiency (economy and feasibility) and also the large and widely dispersed geographies of the population (Cohen et al. 2002). Considering the sample of pupils aged between 7 and 9 years old, the researcher had obtained parental consent through the parent’s consent form. The parents’ consent forms were distributed to the selected school administrators of this study based on the research sampling method. Unfortunately, only 13 primary schools were successfully involved and 448 consent forms were collected (see Table 8.2), instead of 16 primary schools and 444 samples that were obtained through the cluster sampling approach.

8.4 Results

8.4.1 Prevalence Rate of Dyscalculia According to Gender

Table 8.3 shows the prevalence rate of dyscalculia among primary school students according to their gender. There were 3.47 % of males and 4.38 % of females who were suffering from dyscalculia. These results unveiled that females were slightly higher in number than males.

8.4.2 Prevalence Rate of Dyscalculia According to Location of the School

The analysis of prevalence according to school location revealed that, 3.91 % of urban students and 3.42 % of rural students had shown the evidence of dyscalculia (see Table 8.4). These results indicated that the students in the urban area had higher prevalence rate, which may affect the mathematics learning process on the mathematics learning in their schools.

8.4.3 Difference in the Prevalence Rate of Dyscalculia According to Gender

H_0 : there is no significant difference in prevalence rates of dyscalculia among primary school students according to gender

Table 8.5 depicted the probability value of 0.403 derived from the analysis of independent sample T-test in SPSS was more than the specified alpha value (.025). As a result, the null hypothesis (H_0) was unsuccessfully rejected. There was substantial evidence to conclude that the mean of prevalence rates of dyscalculia for

Table 8.3 Prevalence of dyscalculia according to gender

Gender	Total sample	Dyscalculic students	Prevalence
Boy	288	10	3.47 %
Girl	160	7	4.38 %

Table 8.4 Prevalence of dyscalculia according to location of school

Location	Total sample	Dyscalculic students	Prevalence
Urban	331	13	3.91 %
Rural	117	4	3.42 %

Table 8.5 Results of T-test for H_0

Group statistics		N	Mean	Std. deviation	Std. error mean
Dys	Boy	288	4.87500	1.348312	.079450
	Girl	160	4.98906	1.438560	.113728

Independent samples test		Levene's test for equality of variances		T-test for equality of means					95 % confidence interval of the difference	
Dys		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
		Equal variances assumed	.318	.573	-.838	446	.403	-.114063	.136184	-.381705
Equal variances not assumed				-.822	311.025	.412	-.114063	.138731	-.387033	.158908

both males and females were equal. It means that there was nonsignificant gender difference between male and female groups. This conclusion was formed based on the significance level of $\alpha = .05$ (5 %) or confidence level of 95 %.

8.4.4 Difference in the Prevalence Rate of Dyscalculia According to School Location

H₀₂: there is no significant difference in prevalence rates of dyscalculia among primary school students according to school location

According to the analysis of independent sample T-test in SPSS, the probability value of 0.000 was less than the specified alpha value of .025 (see Table 8.6). Consequently, the null hypothesis (H_{02}) was successfully rejected and it could be concluded that the mean of the prevalence rates of dyscalculia for both urban and rural school students were different. In other words, there was a significant difference between students in the urban and rural schools (significance level of $\alpha = .05$ or confidence level of 95 %).

8.5 Discussion and Conclusion

Dyscalculia can involve making sense of numbers, difficulties with arithmetic, remembering numbers and formulae, estimating numbers, estimating distance and time (Adler 2008). Therefore, the presence of dyscalculia may affect mathematic performance among normal students. This learning difficulty in mathematics occurs among individuals across the whole IQ range. The estimated prevalence of dyscalculia range is between 3 and 6% of the population. However, the prevalence of learning disabilities among school children varies from country to country. It is largely dependent on the definition used to classify learning disabled children in each country.

The findings of this study show that there were 3.47 % of boys and 4.38 % of girls are suffering from dyscalculia. These results indicated that the prevalence of females was slightly higher than the males (males:females ratio was 0.79:1). This finding was supported by the finding of Ramjee's (2003) study which suggested that girls had more learning disability than boys; it may be due to the reasons that the girls had to do more work at home than the boys, because of the parents' negative behavior to them. Based on the analysis of independent sample T-test discussed above, there was no significant gender difference between male and female groups. This result was supported by the finding of Karimi (2013) and Nilesh Shah and Tushar Bhat (2008) who found that the prevalence of dyscalculia in the school-aged population is as common in girls as in boys. Yusha (2013) in his gender difference study concluded that the treatment given to the experimental groups was

Table 8.6 Results of T-test for H_0^2

Group statistics		Area	N	Mean	Std. deviation	Std. error mean
Dys	Urban		331	4.75529	1.325797	.072872
	Rural		117	5.36966	1.436740	.132827

Independent samples test										
Dys	Equal variances assumed	Levene's test for equality of variances		T-test for equality of means					95 % confidence interval of the difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
	Equal variances assumed	2.367	.125	-4.214	446	.000	-.614371	.145794	-.900900	-.327842
	Equal variances not assumed			-4.055	190.280	.000	-.614371	.151503	-.913213	-.315529

significantly effective for dyscalculic students and confirmed that no gender difference in academic performances at both pre-test and post-test levels. Apart from that, there were no difference between gender in the arithmetical performance (Komoula et al. 2004).

The analysis of prevalence according to school location revealed that 3.91 % of urban students and 3.42 % of rural students had shown the evidence of dyscalculia. This result seems to indicate that the students in an urban area have higher prevalence rates which may affect the mathematics learning process in their school. However, it should be realised that the respondents in this study were involved the LINUS students and their participation was entirely dependent on parental consent. Of the 448 students who participated in this study, there were only 117 students or 26.12 % who were from the rural area. This had led to a difficulty in obtaining the expected results, as rural area was poorer, and the teachers were less experienced and more absenteeism (Najabae 2014). The analysis of independent sample T-test indicated that there was a significant difference between students in urban and rural schools. This finding was supported by a study conducted by Komoula et al. (2004) of 240 Greek students between the ages of 7–11 years old from rural and urban areas, and they had found a significant difference between both areas.

There is little research being done on dyscalculia in general, and Malaysia in particular. With the exception of a few small-scale studies carried out, little is known about the prevalence of the problem. With a dearth of a large nationwide data, the seriousness of the problem will continue to go unabated. Being touted as the dyslexia of mathematics, dyscalculia is still very much an unknown phenomenon. Much like a child who cannot connect sounds with letters, the dyscalculia child cannot relate that five fingers are the number “5”. However, unlike the dyslexic child who is identified, tested and offered remedial intervention, the child with dyscalculia often goes unnoticed. The cultural bias against mathematics in Malaysia today, where the mathematically inclined are thought to have superior intelligence and genetic predisposition, has created a climate where the mathematically disabled student is allowed to remain unnoticed and unchallenged.

References

- Adler, B. (2008). *What is dyscalculia?* Cognitive Centre in Sweden. Retrieved on May 13, 2012, from URL: <http://www.dyscalculiainfo.org/>
- Chin Kin Eng, Vincent Pang, Wong Ken Keong, Tan Choon keong, Lee Kean Wah, Lay Yoon Fah & Sopia Abdullah. (2014). A preliminary study for dyscalculia in Sabah, Malaysia. In *Proceedings of international conference on education in mathematics, science & technology (ICEMST 2014)* (pp. 462–469). Konya, Turkey.
- Cohen, L., Manion, L., & Morrison, K. (2002). *Research methods in education* (5th ed.). London: Taylor & Francis Group.
- Desoete, A., Roeyers, H., & De Clercq, A. (2004). Children with mathematics learning disabilities in Belgium. *Journal of Learning Disabilities*, 37, 50–61.
- Devine, A., Soltész, F., Nobes, A., Goswami, U., & Szucs, D. (2013). Gender differences in developmental dyscalculia depend on diagnostic criteria. *Learning and Instruction*, 27, 31–39.

- Farrell, M. (2009). *Foundations of special education: An introduction*. Oxford: A John Wiley & Sons, Ltd. Publication.
- Flanagan, D. P., & Alfonso, V. C. (2011). *Essentials of specific learning disability identification*. Hoboken: Wiley.
- Fuchs, L. S. (2006). *Strategies to enhance young children's mathematical development*. Encyclopedia on early childhood development. Vanderbilt University: Centre of Excellence for Early Childhood Development.
- Geary, D. C. (2004). Mathematics and learning disabilities. *Journal of Learning Disabilities*, 37, 4–15.
- Gifford, S., & Rockliffe, F. (2008). Search of dyscalculia. In M. Joubert (Ed.), *Proceedings of the British Society for Research into Learning Mathematics*, 28(1), 21–27.
- Hallahan, D. P., Lloyd, J. W., Kaufman, J. M., Weiss, M. P., & Martinez, E. A. (2005). *Learning disabilities: Foundations, characteristics, and effective teaching*. Boston: Pearson Education.
- Jenson, E. (2010). *Different brains, different learners: How to reach the hard to reach* (2nd ed.). Thousand Oaks: Corwin A Sage Company.
- Jovanović, G., Jovanović, Z., Banković-Gajić, J., Nikolić, A., Svetozarević, S., & Ignjatović-Ristić, D. (2013). The frequency of dyscalculia among primary school children. *Psychiatria Danubina*, 25(2), 170–174.
- Karimi, S. (2013). Is there gender difference between learning disabled students' performances in mathematical activities? *Mathematics Education Trends and Research*, 2013, 1–7.
- Koumoula, A., Tsironi, V., Stamouli, V., Bardani, I., Siapati, S., Graham, A., et al. (2004). An epidemiological study of number processing and mental calculation in Greek school children. *Journal of Learning Disabilities*, 37(5), 377–388.
- Nazariyah Binti Sani, & Abdul Rahman bin Idris. (2013). Identifying the challenges encountered by teachers in dealing with indigenous students. *Malaysian Online Journal of Educational Management (MOJEM)*, 1(3), 48–63.
- Newman, R. M. (1998). *The dyscalculia syndrome*. Special education thesis, Dearborn.
- Nojabae, S. (2014). The investigation of prevalence rate and the diversity of learning disabilities among male elementary school students in the West of Mazandaran province. *Arabian Journal of Business and Management*, 3(5), 50–59.
- Prime Minister's Department. (2011). *Government transformation programme (GTP): Annual report 2011*. Government of Malaysia.
- Ramjee Prasad Pandit. (2003). Factors affecting learning disabilities in mathematics: A study of central region of Nepal. *Tribhuvan University Journal*, XXIV(1): 13–19.
- Reigosa-Crespo, V., Valdas-Sosa, M., Butterworth, B., Estavez, N., Rodr guez, M., Santos, E., Torres, P., Suarez, R., & Lage, A. (2011). Basic numerical capacities and prevalence of developmental dyscalculia: The Havana survey. *Developmental Psychology*, 47, 1–13.
- Shah, N., & Bhat, T. (2008). Clinical practice guidelines for the specific learning disorders (Lead paper). *Indian Journal of Psychiatry*, 50(1), 68–95.
- Teoh Hooi-Ting, & Lim Ming-Koon. (2007). *Situation of persons with learning disabilities and their families in Malaysia*. Paper presented at the regional workshop on the empowerment of persons with intellectual disabilities and their families in Asia and the Pacific, Shanghai, China. Retrieved on July 24, 2012, from URL: <http://www.worldenable.net/shanghai2007/papermalaysia.htm>
- Teoh, H. J., Cheong, S. K., & Woo, P. J. (2008). Students learning disability experiences, training and services needs of secondary schools teachers. *Malaysian Journal of Psychiatry Ejournal*, 17(2), 23–36.
- Voutsina, C., & Qaimah Ismail. (2007). Issues in identifying children with specific arithmetic difficulties through standardised testing: A critical discussion of different cases. In *Proceedings of the British Society for Research into learning mathematics*. London. 27(1), March 2007.
- Wilson, A. J. (2008). *Dyscalculia: Why do numbers make no sense to some people?* Retrieved on December 1, 2012, from URL: www.aboutdyscalculia.org
- Yusha', M. A. (2013). Investigating and remediating gender difference in mathematics performance among dyslexic and dyscalculic learners in Sokoto State, Nigeria. *Journal of Education and Practice*, 4(8), 15–22.

Chapter 9

Perceived Effectiveness of the Basic English Curriculum: Vietnamese University Graduates' Perspectives

Thuy Thi Bich Thuy Tran

Abstract The purpose of this study was to explore the effectiveness of the Basic English curriculum design and delivery at two selected Vietnamese non-language major universities specialising in Finance and Accounting. Research indicates that the curriculum framework in Vietnamese universities which is promulgated by the Ministry of Education and Training (MoET) results in heavy workloads for academic staff. This negatively affects their wellbeing and may reduce their effectiveness as teachers and researchers. This study which is part of a research study on the role of leadership in promoting and supporting the Basic English curriculum (BEC) design and delivery in two selected Vietnamese universities examined perceptions of graduates about the effectiveness of the Basic English curriculum design and delivery. The findings provide insights into graduates' perspectives about the Basic English curriculum in two selected universities. Recommendations are offered to university leaders, curriculum developers and lecturers about redesigning curriculum to accommodate more communicative skills for graduates to meet the requirements of the workplace.

Keywords Basic English • Curriculum • Effectiveness • Graduate • Perspective

9.1 Introduction

English has gained the predominant role in the foreign language teaching programme at Vietnamese universities since the 'Doi moi- economic policy reform' in 1986 (Van 2008). As Vietnam has established diplomatic relationships with 180 countries,

T.T.B.T. Tran (✉)

Faculty of Education, Victoria University of Wellington, 10 Donald Street, Karori Campus, Wellington, New Zealand

University of Finance and Accounting, Tu Nghia District, Quang Ngai City, Vietnam
e-mail: thuy.tran@vuw.ac.nz; thuyhuan73@gmail.com

and economic and trade ties with 230 countries and territories in the world, Vietnamese people in general and Vietnamese students in particular are aware of its importance as an official international language to access information and meet the needs of the labour market in terms of the processes of modernisation, industrialisation, integration, and globalisation. Therefore, English provides the Vietnamese with more opportunity to improve their study, work, and living conditions. Vietnamese students are required to be able to communicate in English fluently enough to apply for jobs in both the domestic and international labour markets, and in the sectors that provide high-paying jobs. With regard to the importance of English before graduation as well as embarking on employment opportunities, students are expected to use English at the pre-intermediate level which is equivalent to B1-CEFR after finishing the English credits course prior to their graduation ceremony (Hien 2014; Phi et al. 2014). This regulation is stipulated in the National Foreign Languages Project 2020 according to Decision No 1400/QĐ-TTg signed by the Prime Minister of Vietnam in 2008. In the domestic labour market, apart from good skills, one important requirement to work in a foreign company or a joint venture is English proficiency, especially for positions like executive assistants, bank clerks, accountants or auditors and so on. These employees are required to do research, attend meetings, and do other clerical office work in which English is indispensable in daily communication. Therefore, mastering English is a requirement in today's competitive world of work (Tuyet 2013a).

In reality, Vietnamese graduates' inability to communicate in English has been open to criticism. According to Anh and Tho (2014), there are about 40 training providers including 24 HEIs which offer Finance-Banking training across Vietnam. Every year there are about 11,000 graduates with Bachelors in Finance-Banking. Among this large amount of graduates, only a few students are employed by banks in Vietnam because many of them lack English communication skills as well as critical thinking and soft skills (Hoan 2014). Accordingly, a lack of English proficiency may have lowered the competitiveness of Vietnamese graduates compared with that of citizens from neighbouring countries who will arrive in Vietnam to find jobs when the ASEAN economic community (AEC) comes into being at the end of 2015, transforming ASEAN into a region with free movement of goods, services, investment, skilled labour, and freer flow of capital (Minh 2014).

Successful learning and teaching requires curricula that are effective in terms of goals, learning activities and assessment. Curriculum design is a key topic under consideration for the well-being and effectiveness of higher education (Barnett and Coates 2005). However, research has shown that the curriculum framework in Vietnamese universities, which is promulgated by the MoET, results in heavy workloads for academic staff (Gropello et al. 2008; Van 2011). MoET prescribes the curriculum framework for all undergraduate courses, including 'content structure, numbers of subjects and duration of training, time proportion between practicing and practising' (Hayden 2005, p. 9). This has a negative effect on their well-being and reduces their effectiveness. This paper, part of a research study on the role of leadership in promoting and supporting the Basic English curriculum design and delivery at two Vietnamese universities, reports on an online survey which gleaned graduates' perspectives about the effectiveness of the Basic English curriculum.

9.2 Context of the Study

English is one of the compulsory foreign languages subjects for non-major language programmes at the two Vietnamese universities selected in this study. A curriculum framework has been constructed, specifying that foreign languages are taught with 10 credits accounting for 10 % of the total credits of an undergraduate programme according to MoET. However, after completing the 10 credits in the first and second years of study, graduates' English competence is very limited (Anh 2010; Gropello et al. 2008). It is questionable as to whether students can use their English in the workplace and for communication, as Decision No 1400/QD-TTg mentioned earlier required.

When studying foreign languages in general, and English in particular, a combination of the skills of reading, writing, listening and speaking are involved. The limited attention given to these skills was noted by the Deputy Minister of Education and Training, Nguyen Vinh Hien, who indicated that teachers have been focusing on grammar instead of other skills (VNS 2012). In Vietnam's higher education, English is taught nationally as a discipline and as a subject (Van 2011). In the former category, students study English as their major to gain a Bachelor of Arts (BA), a Master of Arts (MA) or a doctoral degree in English so that they can become teachers, interpreters or researchers in English linguistics or in English language teaching. In the latter category, English is a compulsory subject taught across the entire higher education system at non-language major universities. Students study 14/140 credit hours. Ten percent of the total English credit hours of an undergraduate programme are divided into two parts, Basic English and Academic English, according to MoET's regulations. Normally, each institution in the aforementioned latter category teaches their students Basic English and then Academic English for their students' own major. Moreover, tertiary English language education is held accountable for the poor outcomes for students because little attention is given to the development of communicative competence overall (Ly 2010). There are several reasons which badly affected the effectiveness of teaching and learning English at Vietnamese on language major universities resulting in graduates' lack of English language competence. These are as follows:

- low English levels of the majority students when entering university (Van 2007)
- large class size (Van 2008)
- lack of authentic context for language study (Huong 2010)
- traditional form focus on instruction rather than interactive teaching approaches (Tuyet 2013a)
- English test design is problematic, being designed to recheck the grammar and structures students learnt in the programme (Van 2008)

Despite a great deal of effort and investment which is put into teaching and learning English at tertiary level in Vietnam, the English competence of the majority of university students and graduates is quite modest as they do not appear to be confident with their English speaking skills (Tuyet 2013b). The need to improve English language teaching and learning has become one of the most important tasks

at Vietnamese non language major universities in general, and at the two selected universities in this study in particular. This is vital in order to help students better prepare for the social and labour market demands in this globalised era as well as in the process of higher education reform in Vietnam.

At the two universities in this study, the 10 % of the English credits are divided into three terms. The first two terms, which consist of ten credits, are for Basic English, and the last term of four credits is for English for specific purposes in their own discipline such as Finance, Banking, Accounting, and so on. Although the curriculum emphasises four language skills, examinations are based on only two skills, reading and writing, while the other two skills, listening and speaking, are not formally assessed. Therefore, the communicative competence in English of the Vietnamese workforce has not met the requirements of the employers (Anh 2010) and this, to a large measure, can be attributed to the design and delivery of the English curriculum. In Vietnam's higher education, English is taught nationally as a discipline and as a subject (Van 2011). In the former category, students study English as their major to gain a Bachelor of Arts (BA), a Master of Arts (MA) or a doctoral degree in English so that they can become teachers, interpreters or researchers in English linguistics or in English language teaching. In the latter category, English is a compulsory subject taught across the entire higher education system where students study 14/140 credit hours. In addition, ten percent of the total English credit hours of an undergraduate programme are divided into two parts Basic English and Academic English. Moreover, tertiary English language education reveals poor outcomes for student because little attention is given to the development of communicative competence overall (Pham 2007). Furthermore, some tertiary universities select imported English textbooks which have no contextual relevance and mandate a number of units for teaching Basic English within the amount of time stipulated by MoET whereas other institutions design their own programmes.

Different universities take a different view on what to teach. This creates diversity on the one hand and confusion on the other. Normally, each institution in the aforementioned latter category teaches their students Basic English and then Academic English for the students' own major. The following section presents the methodological approach in this study to explore graduates' perspectives on the BEC that they had learnt at their university. Because of the above-mentioned reasons, this paper aimed to investigate the effectiveness of the Basic English curriculum at Vietnamese universities and find out solutions which are necessary to put in place to encourage and help Vietnamese students achieve high levels of communicative ability and thus be well-prepared for the workplace.

9.3 Methodology

This study applied quantitative method. A five-point rating scale questionnaire was designed using Qualtrics online survey software to elicit graduates' perceptions about the effectiveness of the current BEC taught at the two universities. The use of

online surveys as a data collection method in research as they are a fast and inexpensive way of gathering data (Dillman 2007). I followed the constructing procedures described by Cohen et al. (2007) related to direct statements that elicit responses in Likert-style response format with a five-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). An online survey of five-point rating scale of 14 questions was designed to investigate graduates' perceptions about the effectiveness of the current Basic English curriculum taught at the two universities. Perceptions of each construct are elicited with two or more statements, which allowed for checking the internal consistency of the responses as well as eliciting their perceptions of specific factors. Space was also provided to elicit further comments on or explanations of each statement, for the purpose of clarification. The OS enabled me to explore the graduates' perceptions about the current curriculum used to teach in the two universities as the results of the questionnaire offered suggestions to academic leaders for a more efficient Basic English curriculum design and delivery.

After getting the approval from the Ethics Committee of Victoria University of Wellington, the questionnaire was then trialled for readability with four individuals, including two volunteer graduates and two experienced teachers of English before embarking on the online survey of graduates. The sample targeted 100 graduates which is about ten percent of the graduates from each selected university so as to represent a reliable sample for data analysis. I contacted the department of student affairs at each selected university and they sent me the list of emails without the graduates' names attached. After that I emailed graduates to invite them to join the survey. For those who agreed to complete the survey, I directly sent them an electronic questionnaire via email (See the appendix). Six questions, each representing a sub-issue, were chosen from the 14 online questionnaires to help answer the research question:

What perspectives do graduates have about the effectiveness of the Basic English curriculum at the two selected universities?

9.4 Findings

This section discusses the findings from the OS completed by graduates from the two selected universities. Not all questions from the OS are discussed in this section. However, the qualitative comments from the online questionnaires have been included as these provide insights into graduates' perceptions of the Basic English curriculum. The responses show the students mostly agreed that the Basic English curriculum is effective, however many also offered constructive comments which will be discussed later. In particular, these include the recommendations offered by graduates to university leaders, curriculum developers and lecturers about redesigning curriculum to accommodate more communicative skills learning. The first section discusses graduates' perspectives on the relevance of the Basic English curriculum to new graduates at work. The second section explores graduates'

perspectives on the flexibility within the Basic English curriculum to facilitate student learning. Next, graduates' perspectives on the allocation of the credit hours for English instruction between theory and practice respectively at the two universities are explained. Following this is graduates' perspectives on their lecturers' teaching and the different forms of assessment. Graduates' perspectives on the challenges faced by new employees when they communicate with their senior colleagues and work supervisors are then presented, and the final section addresses graduates' perspectives on English speaking clients' misunderstandings because of their own low levels of English. The OS data revealed a number of barriers facing graduates as new employees. This section focuses on discussing new employees' low competence in the English language and their need for the curriculum to include more practice in listening and speaking.

9.4.1 Graduates' Perspectives on the Relevance of the Basic English Curriculum at Work

As seen in Table 9.1 below, 17 % of the graduates strongly agreed that the content of the Basic English curriculum is relevant to their work environment and 80 % agreed with this. In contrast, 2 % thought the content was not relevant and 1 % did not offer an opinion.

However, the numbers which recorded 'strongly agree' and 'agree' may not accurately reflect the respondents' true opinions. This is because politeness is inherent in Vietnamese culture and consequently the participants may have felt compelled to answer as they did. Because the cultural context may have influenced the data, the comments could be more relevant than the percentages reported here. This feature may also be evident in this section and subsequent findings. The high level of agreement, as mentioned above is a reflection of an aspect of politeness in Vietnamese culture where the graduates wanted to express their politeness and respect to their lecturers. This politeness may explain the disparity between the quantitative percentage and the strong qualitative comments as is seen in the feedback from two graduates from University One and one from University Two.

The two graduates from University One stated unambiguously:

The content of the curriculum needs to increase the periods of listening and speaking so graduates like me can apply what I learned when communicating at work. I don't think it is really practical for my work.

Table 9.1 Relevance of the Basic English curriculum to practical work

Question	Rating scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The content of the Basic English curriculum is relevant to your practical work	17 %	80 %	1 %	2 %	0 %

These perspectives indicate that the content is not balanced in terms of dividing the hours for each language skill, especially the lack of speaking drills for students to apply in workplace situations.

A graduate from University Two suggested applying authentic situations in the workplace in the curriculum:

I think it is necessary to embed a variety of real workplace situations in the lessons so students can see the relevance.

These graduates’ comments indicated they would like more speaking and listening practice so they can communicate effectively in the workplace. This finding is supported by Huyen (2012) who found that new employees are not good at English communication skills. Therefore, a significant number of companies need to retrain new employees (VNA 2013).

9.4.2 Graduates’ Perspectives on the Flexibility of the Structure of Basic English Curriculum

As shown in Table 9.2 below, 12 % of the graduates surveyed strongly agreed that the structure of the Basic English curriculum (in terms of listening, speaking, reading and writing) is sufficiently flexible to facilitate learning. Only 1 % disagreed while 11 % were hesitant and did not voice their opinions. Flexibility here can be understood as teachers combining aspects of the curriculum in their teaching periods, for example reading and writing, listening and speaking, speaking and writing, etc. The majority of the students (76 %) expressed agreement about the flexibility of the structure of the Basic English curriculum and they also offered opinions relating to teachers facilitating more speaking and listening practice.

Their comments revealed that the curriculum still focuses on reading and writing while less attention is given to the other two communicative skills. As one graduate reflected:

The curriculum focuses on vocabulary, grammar, and writing while graduate need more oral skill in the workplace.

This comment indicates that the prominence given in the universities to the Basic English curriculum does not have an appropriate focus according to graduates.

Table 9.2 Flexibility of the structure of the Basic English curriculum

Question	Rating scale				
The structure of the Basic English curriculum (in terms of listening, speaking, reading, writing) is flexible to facilitate the learning of students	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
	12 %	76 %	11 %	1 %	0 %

Perhaps the reason for this is that when they start work grammar is of less importance to them than speaking and listening and more practice in these skills would be of far greater value. Their lack of confidence is also reflected in the graduates not taking all the opportunities to talk with English speakers, including outside work. This finding correlates with Tuyet (2013b), who posited that students are shy to speak to English speaking people when they have a chance to communicate.

9.4.3 *Graduates' Perspectives on the Appropriateness of Time Allocation*

Table 9.3 shows 29 % of graduates disagreed with the allocation of the credit hours between theory and practice. They consider the time allocation is inappropriate, 4 % indicated their strong disagreement and 20 % did not respond. Conversely, 17 % of the students showed their strong agreement about the appropriateness of the credit hours between theory and practice and 30 % agreed the allocation is appropriate. The percentage of graduates who agreed is similar to those who disagreed. In this context, theory means grammar and vocabulary and practice refers to speaking and listening.

Graduate students expressed their views on the excessive theoretical content of the Basic English curriculum, saying fewer hours should be spent in this area as their priority is listening and speaking:

Practice should be given more prominence.

There are too many theoretical hours. Students need more oral drills. I think the curriculum is illogical because there are only a few practical hours.

From their comments, it can be seen that the graduates perceive that the Basic English curriculum at both universities is not balanced because the emphasis is on theory with only a few practice hours. In reference to this, they offered many constructive comments about the ineffectiveness of the curriculum as well as their legitimate aspiration of having more practice in listening and speaking English because of their need to communicate effectively in the work environment. Therefore, changes to the Basic English curriculum suggested by students are, one, that *“The amount of listening hours should be increased and the amount of grammar should be reduced.”*, and two, that *“More oral work situations should be included in the curriculum. Theory dominates.”*

Table 9.3 Appropriateness of time allocated to theory/practice

Question	Rating scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The total amount of credit hours between theory and practice was appropriate	17 %	30 %	20 %	29 %	4 %

9.4.4 *Graduates' Perspectives on Lecturers' Teaching and Assessment*

As shown in Table 9.4, 27 % of the students expressed their strong approval of their lecturers' teaching and different forms of assessment. 64 % were satisfied with their lecturers' teaching as opposed to the 2 % who recorded their dissatisfaction, while none expressed their dissatisfaction strongly.

Generally, the majority of the graduates indicated that they were pleased with their lecturers' teaching and assessments. The positive results here clearly outweigh the negative. As discussed, these positive results may refer more to the lecturers than the assessment results. A comment from one participant reflects: "*My teachers were very helpful.*"

Others however, included their dissatisfaction about the theoretical assessments:

The teachers are very enthusiastic and kind but the content is heavy in theory so the assessment is also heavy in theory.

We are often assessed in written tests.

The comments from graduates revealed that they focus on theory and writing to pass the written tests while their oral communication skills will fade in the course of time even though they have four skills in the curriculum.

9.4.5 *Graduates' Perspectives on Difficulties in Working with Senior Colleagues*

As seen in Table 9.5, 11 % of the students strongly agreed they face challenges communicating with their senior co-workers and work supervisors in English, 60 % agreed and only 9 % felt confident in this area.

Table 9.4 Graduates' satisfaction with the lecturers' teaching and assessment

Question	Rating scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I am satisfied with the lecturers' teaching and different forms of assessment	27 %	64 %	7 %	2 %	0 %

Table 9.5 Challenges involved in working with senior colleagues

Question	Rating scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I find it challenging working with English speaking senior colleagues or work supervisors	11 %	60 %	20 %	9 %	0 %

One of the students expressed the reasons for his lack of confidence when speaking English:

I am often shy when I communicate in English because I am usually afraid of making mistakes.

Other reasons explained their lack of confidence as: “*Many of my senior colleagues are very good at speaking English therefore I am not self-confident to communicate with them.*”, and “*Some of my co-workers speak English like native speakers.*”

Students also made recommendations for the university. The first is to the university leaders suggesting they re-apportion the hours to allow more practice for English language instruction. To the curriculum developers they proposed the curriculum should be redesigned to accommodate more communicative skills. Further, they recommended the inclusion of oral assessments in examinations. These changes would help them to develop the English language competence needed in their workplaces.

9.4.6 Graduates’ Perspectives on Their Communication Difficulties

As shown in Table 9.6, the majority, 59 % of graduates reported that their poor English skills often led to misunderstandings with their customers, while 9 % strongly disagreed and 7 % disagreed. As with most learners of a foreign language, the graduates may feel embarrassed because of their low English language competence. Furthermore, it is likely that the reasonably high neutral percentage could be another example of Vietnamese politeness and respect given to teachers.

Some of the graduates made comments about their low English communicative skills when communicating with a variety of clients at work:

Some of my customers often speak English very fast like singing.

Their replies indicated that the speed and the variety of accents of English-speaking customers challenged them. It could therefore be assumed that more practical lessons and being exposed to different accents would probably be of considerable assistance to them. Other graduates mentioned their difficulties in communicating with a variety of customers at work:

Table 9.6 Graduates’ difficulties in communicating with customers

Question	Rating scale				
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
My English speaking clients find it difficult to understand my English	4 %	59 %	21 %	7 %	9 %

Customers who know English speak very fast so I find it difficult to understand what they mean.

In summary, the findings presented the key issues which emerged from the responses of graduates from both universities to the OS questionnaires. Graduates expressed their views on the excessive theoretical content of the Basic English curriculum, saying fewer hours should be spent in this area as their priority is listening and speaking. To this end, they emphasised practice in listening and speaking, in typical work situations, and also suggested that hours for this practice should be doubled.

9.5 Discussion

In this section, the views of graduates about the effectiveness of the Basic English curriculum design and delivery at the two universities are analysed. The graduates of the online survey seemed to agree with each other on the challenges graduates from the two universities face as new employees and the reasons why graduates face these barriers. One of the reasons suggested is their lack of English language skills. The findings show graduates fail to communicate with their co-workers and supervisors in the workplace in English due to their poor English skills. Their listening and speaking skills are not good so it is difficult for them to adapt quickly to their new jobs.

There is evidence to suggest that the consensus of graduates is substantiated by current practices. The heavy reliance on traditional methodology of teaching English is largely due to the English curriculum at tertiary level focusing heavily on grammar, reading and writing rather than oral communication. Furthermore, the semester examinations at many universities and colleges in Vietnam nowadays are written rather than oral tests (Lan and Anh 2013; Tuyet 2013a). The curricula at higher education institutions in Vietnam are still heavily focused on theory with a lack verbal communicative practice which is consistent with Le and Barnard's (2009) study which revealed shortcomings in the English curriculum in Vietnam's education system. As a result, higher education institutions are criticised for not producing quality graduates. This is also recognised by what Vu Duc Dam, Deputy Prime Minister, confirmed when he answered a Dantri reporter's question about the training quality in Vietnamese higher education system (Hung 2013). Vu replied saying the Vietnamese higher education system has some weaknesses. He also added that according to a report he received, about 30 % of universities and junior college graduates cannot find employment. It could be extrapolated from this that the training quality in Vietnam's higher education institutions is unsatisfactory.

Graduates also offered additional views on the challenges they face in communicating at work. Graduates mentioned their difficulties in communicating with a variety of customers at work. For example, English-speaking customers speak very fast, thus, some graduates find it difficult to understand what their customers mean.

Moreover, another graduate confessed: “Some customers speak with a variety of accents so we cannot catch their voices.” As with most learners of a foreign language the graduates may feel ashamed of their low English language competence. The reason for their communicative challenges with clients may be because they have not invested enough time practising pronunciation, listening and speaking. One result of this is they are unfamiliar with the variety of accents of native English speakers and others with English as a second language.

Some of the graduates, who answered the online survey, also mentioned other challenges. Their comments revealed that the curriculum still focuses on reading and writing while less attention is given to the other two communicative skills. The recommendation from a graduate reflects this issue of heavily theoretical teaching: “Universities should concentrate on helping students practice speaking and listening and should not focus too much on grammar.”

This comment indicates that the prominence given to grammar in the universities’ BECs does not have the right emphasis for the graduates. This may be because when they start work, grammar is of less importance to them than speaking and listening and more practice of these skills would be of greater value. Their lack of confidence is also reflected in the graduates not taking all the opportunities to talk with English speakers, including outside work. This finding correlates with Anh (2010), who posited that students are too shy to speak to English speaking people when they have a chance to communicate. Another graduate notes the unsuitable BEC assessments: “Normally, we have multiple-choice tests on grammar and writing so we are unable to improve our communicative skills.”

Due to more theoretical assessments, students focus on writing and neglect communicative skills to ensure they pass. According to Dang Van Hung, Vice-Director of SEAMEO Vietnam, English textbooks in Vietnam have all the four skills, however, the examination only focuses on grammar and vocabulary tests (Lan and Anh 2013). Further, the format of the examination influences the teaching methods. That is, teachers teach to the outcomes. Therefore, students do not have sufficient practice at English speaking skills and most of which they have learned are lost through lack of use, resulting in inadequate skills when they start work.

Other graduates made similar comments about the BEC being weighed too heavily on theory and also stressed that more hours should be spent on speaking and listening: “I think it is not appropriate because there are too many hours for grammar and too few listening and speaking hours.” and, “The practice hours should be doubled.”

These comments clearly emphasise graduates’ desire for more speaking and listening hours. They offered many constructive comments in the survey about the ineffectiveness of the curriculum as well as their legitimate aspiration of having more practice in listening and speaking English because of their need to communicate effectively in the work environment. As with most learners of a foreign language the graduates may feel embarrassed about their low English language competence. The reason for their communicative challenges with clients may be because they have not invested enough time practising pronunciation, listening and speaking. One result of this is they are unfamiliar with the variety of accents of native English speakers and others with English as a second language.

This section presented the key issues which emerged from the responses of graduates from both universities to the online survey questionnaires. When looking further into the six themes related to the research question, graduates students offered many comments about their legitimate aspiration of having more practice in listening and speaking English because of their need to communicate effectively in the work environment. In brief, this section discussed the key issues which emerged from the graduates' perspectives on the challenges they face when dealing with customers.

9.6 Research Implications and Conclusion

The goals of this study were to examine perceptions of graduates about the effectiveness of the Basic English curriculum design and delivery. The findings of the research have implications for practice. The following recommendations are offered to university leaders, curriculum developers and lecturers about redesigning curriculum to accommodate more communicative skills for graduates. Graduates expressed views on the excessive theoretical content of the BEC, saying fewer hours should be spent in this area as their priority is listening and speaking. Therefore, this paper has several practical implications with regards to suggestions made by graduates to institutional leaders, curriculum developers and teachers.

9.6.1 For Institutional Leaders

- University leaders should consider re-apportioning teaching hours among the four skills to allow more practice for English language instruction. Another necessary change is to place students in smaller classes based on their levels of English. This would make classes more manageable and timetabling lessons for each skill would enhance instruction and improve students' acquisition of the English language.
- Finally, further investment in extending the campuses, purchasing new teaching aids and appropriate resources for teaching should be a priority.

9.6.2 For Curriculum Developers and Lecturers

- Curriculum developers should consider redesigning the curriculum to have a more communicative focus. Time spent on grammar and translation should be reduced and more oral work situations should be included to ensure graduates are better prepared for work when they leave university.
- Curriculum should be reviewed and if necessary, revised on a regular basis to better serve the changing needs of both students and society broadly. Redesigning

curriculum and the inclusion of oral assessments in examinations would undoubtedly help graduates to develop the English language competence needed in their workplaces.

- EFL lecturers should consider their methods of classroom activities that encourage more speaking practice. For example, organizing 5 or 10 min seminars or group discussions to help students improve their confidence in communication.

This paper had presented the graduates' perspectives on the effectiveness of the BEC from an online questionnaire. It is also pertinent to reiterate the 'politeness' inherent in the Vietnamese culture which might have affected some of the results of the survey. However, it cannot be said that all answers to the questions were the result of this 'politeness' and respect they have for their universities and lecturers. In fact, the comments made by many of the respondents may challenge the accuracy of their answers to the online questionnaires. The recommendations the graduates offered would assist them to develop the English language competence needed in the workplace. Moreover, a greater English language competence would also enable them to contribute to Vietnam's socio-economic development in this era of industrialisation, modernisation and international integration. Findings from this research may contribute to a greater understanding of students' perceptions in relation to the effectiveness of BEC in the Vietnamese tertiary education context but also in other countries where English is taught as a foreign or second language.

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References

- Anh, H. K. K. (2010). Use of Vietnamese in English language teaching in Vietnam: Attitudes of Vietnamese university teachers. *English Language Teaching*, 3(2), 119–128.
- Anh, T. N., & Tho, V. N. (2014). *Biến động nhân lực ngành ngân hàng tại Việt Nam- Thực trạng và giải pháp* (Fluctuation of banking human resource in Vietnam- Problems and solutions). Retrieved from <http://www.tapchiconsan.org.vn/Home/PrintStory.aspx?distribution=30022&print=true>
- Barnett, R., & Coates, K. (2005). *Engaging the curriculum in higher education*. Buckingham: SRHE & Open University Press.
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education* (6th ed.). New York: Routledge.
- Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method 2007 update with new internet, visual, and mixed-mode guide*. Hoboken: Wiley.
- Gropello, E. D., Thomas, C. J., Yemenez, E. Y., Chchibber, A., & Adams, J. W. (2008). *Vietnam: Higher education and skills for growth* (pp. 1–232). Washington, DC: Human Development Department East Asia and Pacific Region, The World Bank.
- Hayden, M. (2005). *The legislative and regulatory environment of higher education in Vietnam*. Washington, DC: The World Bank.

- Hien, V. N. (2014). Thông tư Ban hành khung năng lực ngoại ngữ 6 bậc dùng cho Việt Nam (Decree N⁰¹ on stipulating 6 levels of foreign language competence for Vietnamese students). *MoET*.
- Hoan, P. (2014). Ngành Tài chính – Ngân hàng: Yếu tiếng Anh sẽ thất nghiệp (Finance- Banking majored students: Lack of English competence leads to unemployment). *Dantri* newspaper.
- Hung, N. (2013). *Phó Thủ tướng Vũ Đức Đam: Đào tạo Đại học đang có vấn đề* (Deputy Prime Minister Vu Duc Dam: Training in Vietnamese higher education facing challenges). Hanoi: Dantri.
- Huong, T. T. T. (2010). How do Vietnamese students prepare for study in English speaking universities overseas? *VNU Scientific Journal – Social Science and Humanity*, 26, 230–237.
- Huyen, L. (2012, December 10). College grads lack teamwork, communication skills. *Tuoi Tre*. Retrieved from <http://tuoitrenews.vn/education/4962/college-grads-lack-teamwork-communication-skills>
- Lan, H., & Anh, L. (2013, December 17). Yếu chuyên môn vì thiếu thực tế (Low professional knowledge due to lack of practice). *Nguoi lao dong*. Retrieved from <http://nld.com.vn/giao-duc-khoa-hoc/yeu-chuyen-mon-vi-thieu-thuc-te-20131217095326125.htm>
- Le, V. C., & Barnard, R. (2009). Curriculum innovation behind closed classroom doors: A Vietnamese case study. *Prospect: An Australian Journal of TESOL*, 24(2), 1–14.
- Ly, T. P. (2010). *Vietnamese students deserve a better quality education*. Retrieved 15 April 2010, from http://lypham.net/joomla/index.php?option=com_content&task=view&id=203&Itemid=2
- Minh, L. L. (2014). *Thinking globally, prospering regionally-ASEAN Economic community 2015*. Jakarta: The ASEAN Secretariat.
- Pham, H. H. (2007). Communicative language teaching: Unity within diversity. *ELT Journal*, 61(3), 193–201. doi:10.1093/elt/ccm026.
- Phi, N. N., Mai, T. V., & Ga, V. B. (2014). *Thông tư liên tịch hướng dẫn thực hiện một số điều của Nghị định số 49/2010/NĐ-CP ngày 14 tháng 5 năm 2010 của Chính phủ quy định về miễn, giảm học phí, hỗ trợ chi phí học tập và cơ chế thu, sử dụng học phí đối với cơ sở giáo dục thuộc hệ thống giáo dục quốc dân* (Joint-Circular guiding the implementation of some articles of Decree No. 49/2010/ND-CP dated May 14, 2010 of the Government on exemption or reduction of tuition fees, support costs and ways of collecting fees for educational institutions of the national education system). HN
- Tuyet, T. T. (2013a). Factors affecting teaching and learning English in Vietnamese universities. *The Internet Journal Language, Culture and Society*, 38, 138–145.
- Tuyet, T. T. (2013b). Limitation on the development of skills in higher education in Vietnam. *Higher Education*, 65(5), 631–644.
- Van, T. N. (2007). Foreign language teaching and learning at the University of Engineering and Technology, Vietnam National University. *VNU Scientific Journal – Foreign Language*, 23, 138–142.
- Van, V. H. (2008). Factors affecting the quality of English education at Vietnam National University, Hanoi. *VNU Scientific Journal – Foreign Language*, 24, 22–37.
- Van, V. H. (2011). The current situation and issues of the teaching of English in Vietnam. *立命館言語文化研究*, 22(1), 7–18
- VNA. (2013, November 23). *Vietnam improves English proficiency*, *Dantrinews*. Retrieved from <http://www.dtinews.vn/en/news/020/32128/vietnam-improves-englishproficiency.html>
- VNS. (2012). *Local teachers of English not up to standard Dantri*. Hanoi, Vietnam, *Dantrinews*. <http://www.dtinews.vn/en/news/020/Local-teachers-of-English-not-up-to-standard.html>

Chapter 10

Assessment Strategies to Enhance Learning in Higher Education

Chan Yuen Fook and Gurnam Kaur Sidhu

Abstract This study was conducted to investigate assessment strategies to enhance learning in Higher Education. Qualitative approach of using open ended questions from the questionnaire, interview questions and observation checklist were adopted to collect data in this study. The samples selected for this study comprised 181 undergraduate and postgraduate students as well as 22 instructors from a renowned university in the United States of America. The result showed that most students from the School of Education prefer small assignments, project/paper, feedback, field work, small group discussion, presentation, classroom activities, case study, assigned reading, reflective writing, role play, debate, portfolio, group work and quiz than final exam as the strategies in higher education. Based on the findings, sitting for test/quiz was the least popular assessment strategy while small assignments were the most common. On the other hand, document analysis with checklist further revealed that different courses have different assessment strategies. Nevertheless, interviews conducted with both instructors and students showed a similar preference of assessment strategies in the higher education among students. Generally, the findings can be sub divided into four broad categories; assignment strategies, classroom activities strategies, feedback strategies and reading materials strategies. In conclusion, effective assessments provide information of the students on their achievements to reach the learning goals of higher education institutions. Thus, it is most effective if the assessments were compiled and strategized based on multiple resources to ensure its efficiency in assessing the students' achievements.

Keywords Assessment strategies • Higher education • Learning enhancement

C.Y. Fook (✉) • G.K. Sidhu

Faculty of Education, Asian Centre for Research on University Learning and Teaching,
Universiti Teknologi MARA, Campus Section 17,
40200 Shah Alam, Selangor, Malaysia
e-mail: yuenfook@salam.uitm.edu.my; gurnamsidhu@salam.uitm.edu.my

10.1 Introduction

Formative assessment refers to assessment at regular intervals of a student's progress with accompanying feedback in order to help to improve the student's performance. However, Stiggins (2002) points out that traditional assessment system is still apparent in a number of institutions of higher education because of institutional failure to strike the right balance between summative and formative assessment procedures. Henceforth, under the Malaysian National Higher Education Strategic Plan, there is a call for more formative assessment procedures that focuses on authentic tasks and performance-based assessments as strategies to enhance transformative learning in higher education. This calls for assessment procedures that are more flexible, process orientated, integrative, contextualised and criteria referenced. Such a move centres on 'assessment for learning' encouraging more active and deeper self-regulatory learning which emphasizes on creative and critical thinking, and problem solving. Advocates of formative and alternative assessment believe on-going continuous assessment has more positive implications on teaching and learning compared to one summative assessment. The simple reason is formative assessment is part of the instructional process. Black and Wiliam (1998a, b) explained: "An assessment becomes formative assessment when the evidence is actually used to adapt teaching to meet student needs." As students become more aware of what and how they are learning, they become more motivated. Hence, educators need to build assessments for learning, rather than assessments of learning (Stiggins and Chappuis 2006; Quellmalz and Kozma 2003). When incorporated assessment into classroom practice, it provides the information needed to adjust teaching and learning while they are happening. In this sense, formative assessment informs both lecturers and students about student understanding at a point when timely adjustments can be made. These adjustments help to ensure students achieve targeted standards-based learning goals within a set time frame (Garrison and Ehringhaus 2008).

10.2 Literature Review

According to Drummond (1995), in order to become an outstanding teacher is to continue a life-long professional challenge. He mentioned that the general assumption on new teachers know how to teach because they were once a student themselves. Furthermore, how and what students learn in a classroom merely impacted on the teachers' knowledge of strategies which is used to assess their learning. In relation to the assessment strategy, several points needs to be highlighted such as the efficiency of staff time, organizations' cost-effective factor as well as to ensure that learners find the tasks manageable, relevant and developmental (Brown 2005). In order to make any assessment strategy as inclusive in a teaching and learning environment, a variety of methods for assessment should be deployed.

In the most postsecondary teaching of evaluation in traditional, online and blended approaches shows that the main factor of misaligned is assessment (Reeves and Hedberg 2003). In short, teachers/instructors may have aims, goals and good teaching content but what assessment strategies require are what easy way to measure than what is important (Reeves 2006). The question on what are the methods used to estimate student accomplishment on the course objective has been one of the weakest aspects of both traditional and innovation course design and implementation in higher education (Shipman et al. 2003). A few researchers stated in their studies that among the primary form of assessment in higher education are multiple-choice tests, including true/false and short answer items (Kvale 2007) and in most undergraduate courses, the assessments are based upon multiple-choice or academic essays (Herrington and Oliver 2000).

However, Oliver (2002) argues that different assessment strategies should be followed when assessing learners so that skills, knowledge, attitudes, values and the learning process can be assessed (Olivier 2002). He stresses that assessment should be valid, appropriate, reliable, flexible, fair and sufficient. In other words, the teaching and assessment strategies should be suitable to help learners in achieving the desired outcomes. Teachers and instructors should raise the level of the objective they want to achieve through becoming more engaged in providing a quality teaching as well as to ensure prompt feedbacks are given based on better assessment strategies will result students to show their interest and engage better in academic engagement.

If universities are to be knowledge-intensive learning organizations with respect to teaching as well as research activity, then it is essential that the kind of knowledge needed for professional development is understood. On the outset it seems that little research has been undertaken to identify the professional knowledge utilized by higher education teachers/instructors. According to William (2007), formative assessment could be developed from the following key strategies.

1. Clarifying, sharing, understanding goals for learning and criteria for success with learners
2. Engineering effective classroom discussions, questions, activities, and tasks that elicit evidence of students' learning
3. Providing feedback that moves learning forward
4. Activating students of their own learning
5. Activating students as owner of their own learning
6. Activating students as learning resources for one another

In reference to the six key strategies of implementing assessment for the students, Regier (2012), proposed two types of formative tasks which are, individual strategies and group strategies. Individual strategies assist lecturers to visualize clear pictures of students and their understanding of the concept or skills being measured. On the other hand, group strategies aid lecturers to obtain general information about students' learning (Regier 2012). Besides that, other strategies commonly adopted in assessment are tasks. Dodge (2009) listed four common categories of strategies, such as summaries and reflections; list, charts and graphic organizers;

visual representation of information; and collaborative activities. Each category can define the usual assignments given to the students.

1. **Summaries and reflections:** Students stop and reflect, make sense of what they have heard or read, derive personal meaning from their learning experiences and increase their metacognitive skills. These require students to use content-specific language.
2. **List, charts and Graphic Organizers:** through this strategy, students will organize information, establish connections and note relationships through the use of various graphic organizers.
3. **Visual representations of information:** In these representations, students apply both words and pictures to create connections and develop memory, facilitating retrieval of information which will assist the teacher to notify classroom diversity, preferences in learning style and different ways of knowing.
4. **Collaborative activities:** Students can have the chance to move or interact with others as they establish and express their comprehension of the concepts.

According to Dodge (2009), summaries and reflections require the students to be able to write and increase their metacognition skills. The most common type of an assessment for learning technique in this category is asking students to write reflective journals (Lambert 2012; Illinois State Board of Education 2014; Regier 2012; Dodge 2009). In a reflective journal, students are required to record their understanding of the topic, concept or lesson taught. The teacher will gain information on the students learning when he reviews the entry (Lambert 2012). Illinois State Board of Education (2014) uses the term Writers Notebook instead of Journals. In the notebook, the students need to keep all their writing whether they are informal or formal. The teacher who looks through this notebook will indicate their strength and weaknesses at the response page. Regier (2012) emphasizes that reflection journals encourage students to think about what they have learned and to train them to make connections to their lives.

There are abundant techniques in the List, Charts and Graphic Organizer category. Drawing web and concept maps are one of them (Lambert 2012; Illinois State Board of Education 2014; Regier 2012; Dodge 2009). Lambert's (2012) idea of a concept map is any of several forms of graphical organizers which allow learners to perceive relationships between the concepts using diagramming key words which represents the concepts. Another suggestion on how to apply concept maps is by allowing the students to use drawings, diagrams, photos or maps to demonstrate their understanding of a standard, for example, when the students are watching an educational video, they can create "Doodle Art" which represents the new vocabularies which they have learnt. Regier (2012) suggests for teachers to print concept maps templates and ask the students to fill in the title and the supporting details of a content to make it more practical during the lesson.

In the visual representations of information category, Regier (2012) proposes a demonstration station to help the students visualize a process or a theory. Instructors are advised to set up a number of stations and have students demonstrate how magnets attract and repels, where the strongest area in the magnetic fields and other

scientific processes are. Each station will assist the students in explaining in words verbally, or in written form on the scientific processes as they are able to observe it in front of their eyes. Lambert (2012) also suggests observation activities as an assessment for learning. According to Lambert (2012), teachers can observe the students' anecdotal records, their progress in the activities during lessons and collaborative activities such as conferencing and debating which are happening in the class. Illinois State Board of Education (2014) recommends for the teachers to observe a specific skill or criteria in the learning to be addressed as guidelines in observing.

The last category is the collaborative activities. Illinois State Board of Education (2014) has recommended several collaborative activities, such as, small group discussion, peer assessments and think-pair-share. In the small group discussions, teacher meets the students and asks targeted questions or discusses targeted skills. The teacher can record informally on the students' output to be graded. Moreover, peer-assessment can be done by teaching the students to reflect on other people's work (Illinois State Board of Education 2014). For this kind of assignment, students should be addressed on the criteria of assessment and should be given proper explanation and example to guide them in assessing their friends. Last but not least, think-pair-share is a kind of activity which can be applied when the teacher posits a higher level standard question. Students initially are given 20–30 s to think on their own but on a signal, they need to turn to a partner to discuss their thoughts before they present it to the whole class for a class discussion (Illinois State Board of Education 2014).

10.3 Method

The purpose of this study was to identify assessment strategies employed to enhance learning in higher education. The study adopted a qualitative approach to collect data. The very strength of qualitative discourse is its exploratory nature. In this study, the researcher used open ended questions in the questionnaire, interview questions, and observation checklist to collect data. The sample population comprised 181 undergraduate and postgraduate students and 22 instructors from the School of Education in a university located in the USA. Questionnaires with open-ended questions were administered to all 203 respondents whilst interviews were conducted with 5 undergraduates, 5 postgraduates and 5 instructors to shed some light on the assessment practices in higher education. In addition, document analysis was also conducted on the syllabus used for the 12 courses. Besides that, two courses were chosen for observation in order to gain a deeper understanding of the teaching, learning and assessment practices in the authentic context. Besides that, relevant documents such as course syllabus (syllabi), assignment guidelines, sample assignments and lecture notes were also scrutinized to get a better picture of the courses studied. The data collected were validated by a senior professor in the particular university under study. The interviews were only conducted in the classroom

with the permission of the respective lecturer teaching the course. The researchers assured respondents that all their responses would be treated with the strictest confidence. In addition, the researcher also promised to destroy all the interview scripts at the end of the study.

10.4 Findings

Given below are the main findings obtained from the study.

10.4.1 *Assessment Strategies to Enhance Learning in Higher Education*

When student respondents were asked what strategies have been employed by their instructors to enhance learning in their courses in higher education, they listed the following strategies: small assignments, project/paper, feedback, field work, small group discussion, presentation, classroom activities, case study, assigned reading, reflective writing, role play, debate, portfolio, group and quiz. Among all the strategies, quiz was considered the least popular strategy and small assignment was considered as the most common strategy used to enhance learning in higher education. A total of 85 students (42.5 %) did not provide any response to this question (Table 10.1).

When the students listed assignments as the most common strategy used to enhance learning in higher education, actually they were referring to many different assignments employed in the courses undertaken by them such as project/paper, case study, field work, assigned reading, reflective writing, group work, and portfolio. Regarding the assignment strategy, a document analysis on course syllabus indicated that different courses had different assignment strategies to enhance learning. For example, a postgraduate course at the doctoral level of “Ethical, Legal and Professional Issues in School Psychology” had listed the following nine small assignments in the course:

- Professional goals statement and the theoretical orientation;
- Best practices snapshot;
- Best practices in intervention implementation: Article summary and short videos;
- Thought-provoking question of the week;
- Ethics case study;
- Essay on the school psychologist as a change agent;
- Take-home exam over course;
- Think-and-write essays and
- In-class quizzes

Table 10.1 Assessment strategies to enhance learning in higher education

Assessment strategies	Frequency	Percent
Small assignments	23	11.5
Project/Paper	20	10.0
Feedback	17	8.5
Field work	10	5.0
Discussion	9	4.5
Presentation	8	4.0
Classroom activities	8	4.0
Case study	6	3.0
Assigned reading	4	2.0
Reflective writing	2	1.0
Role play	2	1.0
Debate	2	1.0
Portfolio	2	1.0
Group work	1	0.5
Quiz	1	0.5
No response	85	42.5
Total	200	100.0

The course goal was to emphasize on ethical, legal and professional issues in the provision of comprehensive school-based psychological services with the hope that students would be able to apply introductory critical concepts in organizing, administering and evaluating school psychological services for students, schools and communities. Findings from the observation conducted in the class revealed that the classroom activities applied multiple strategies such as lecture, group discussion and presentation. According to the instructor interviewed, student performance was evaluated based on the course requirements as stated in the syllabus as well as class attendance/participation and online participation.

Regarding reading materials, the instructor identified two main reading texts as stated in the syllabus. Additional readings were made available to her students through the class on course page throughout the semester. The instructor made it a principle for her students to complete reading assignments prior to attending class and participate in class discussion and activities. Regarding assessment strategy, the instructor made it compulsory for her students to receive one peer-review before asking for her feedback. The student needed to indicate the name of the classmate or colleague who conducted the prior peer review. This strategy had made her students become more responsible in their assignments and also provided the opportunity to her students to assess their peers before submitting the draft for her feedback. Having many small assignments in a course was not specific to one course. A doctoral degree course of “Qualitative Inquiry in Education” had listed eight small assignments as follows:

- a site description
- excerpts (4–6 pages) from two “rich” observations, about 1 h each
- meaning field analysis

- validity reconstructions
- a role analysis
- a power analysis
- an interactive sequence analysis
- an essay comparing two ethnographies

According to the instructor, critical qualitative research is distinctive from other forms of qualitative research primarily through the fact that it gives much more attention to social theory than is the case in most articles and textbooks on qualitative research. The instructor disclosed in the interview that additional assignments were possible, such as short essays on some of the reading assignments and assignments involving analytic methods not listed above. He would determine whether these were good ideas or not based on his sense of things as the class moves along. He also adopted multiple classroom strategies such as lecture, small group discussion, video clip and presentation. Since this was a doctoral level class and his students were all mature students, he did not think that grades were helpful for a class like that. Most of the fieldwork based assignments would be on a pass/do-over basis. His comments on his students' work indicated the sort of feedback they needed. He stated his comments as "honest and comprehensive" in the interview. According to two of his students in the interview, they received a commentary from the instructor on each assignment. More often than not, they needed to do their assignment over after reading his feedback in their first effort. The instructor further illiterate this goal as to move all his students to a higher level of competency for each method of analysis taught, and to a deeper understanding of the concepts underlying each method. When a student was asked to do an assignment, the student was required to complete this task in a timely manner. He expected everyone in his class to display learning in their responses to his comments on their work. The instructor believed that feedback could improve a student's learning. The instructor also emphasized that course lectures would not cover everything in the assigned readings in his class; hence his students have the responsibility to finish their readings materials before they come to class. Two of his students in the interview stated that he encouraged his students to contact him, through email, if there were any difficulties in grasping the reading material or if they had any desire to discuss aspects of it which was not covered in class.

Another instructor who taught the same "Qualitative Inquiry in Education" course in a different semester listed the following five small assignments:

- weekly reading questions
- inquiry topic
- prospectus
- class presentation
- project report

According to the instructor, students who enrolled in this course must acquire basic knowledge of philosophical analysis, an in-depth understanding of the development of rational thought in Western culture, a critical perspective on social

trends, training in the formal analysis of language and expertise in a variety of research methods, an awareness of the ethical dimensions of human science research, and aesthetic sensibility. The instructor stressed that the course readings would serve as the basis for class discussions and requirement. Students learn their trade through both scholarship and first-hand experience (i.e., field work). Hands-on in field work was considered crucial for a student to acquire the qualitative research skills. The instructor also warned his students that they would miss out on a lot and experience painful boredom if they did not complete the assigned readings. Through the classroom observation, the instructor played the role as facilitator of learning in his class to encourage active learning among his students. Normally, he started his class with a briefing on the course, followed by two-way communication with his students regarding reading materials and he usually ended his class with student presentations. The above analysis indicated all the instructors have the freedom to design their course syllabus and assignments for their own course in their own way. The freedom has provided instructors with the room to expand their own creativity and innovations in teaching and learning.

Sociology of Education is a course at the master level. It aims to examine the role of schools in society: the emergence of mass, public school systems as principal agency of cultural transmission and socialization in complex societies; the interaction between schooling as a social institution and other institutions of society; the functioning and characteristics of schools as formal organizations; and the contribution of schooling to social system maintenance and change. The document analysis conducted identified that this course had four assignments to enhance student learning:

- paper
- debate
- final paper
- class participation and attendance

During the interview with the instructor, the instructor divulged that her students were active in her class and they enjoyed the class debate very much. Three of the students interviewed stated that they were impressed with the talent of their friends in the debate. The whole class was excited with the debate and they really spent a lot of time to prepare for it. Regarding the reading materials, the instructor fixed two main reading texts, but most of the other readings are available electronically on the on course websites. Her students agreed that the instructor was a nice and helpful person and willing to explain to her students whenever her students had something to check with her. They were grateful to have such a helpful instructor in their course. A bachelor degree course of “Communication in the Classroom” also listed the following nine assignments in the course:

- professionalism paper
- participation: On course postings and peer evaluations
- influential teacher paper
- community building activity

- parent-teacher conference and reflection paper
- individual mini-lesson and lesson plan
- cultural identity paper
- team video role-play project
- group evaluation

According to the instructor who taught the class, students were strongly encouraged to participate actively in class, as contributors to the discussion. She would ensure that her students would come to class prepared by having read and completed assigned materials. This was tested when she asked her students question from time to time. She emphasized on active classroom participation. She stressed that participation included asking questions, making comments, giving feedback, reflecting aloud, and in essence, being active in the experience of the class. Another bachelor degree course of “Leadership Training” listed the following five small assignments:

- 3 Reading Questions
- Paper 1 – Media Diagnosis of Leadership
- Strengths finder assessment
- Paper 2 – Microsoft Development Plan
- Group project – Board of Directors

The purpose of this course was to provide new and future student leaders with learning opportunities to develop the knowledge, attitudes, and skills necessary to be effective in leadership position both on campus and after graduation. During the interview, the instructor told that the class integrated a variety of learning strategies and activities such as student organization participation, lecture, discussion, reflection, guest lectures, presentations, role playing, and simulation exercises to engage student in learning. This instructor provided a detailed scoring for each assignment in the course syllabus so that her students could have a better understanding of the instructor’s expectation for all their assignments. The interview conducted with a student in this course indicated her students enjoyed all the assignments designed by the instructor.

Based on the document analysis and interviews conducted with the instructors and students, the researcher identified a similar pattern of assessment strategies employed in higher education. Basically the strategies adopted by instructors to enhance learning in higher education can be divided into four broad categories:

- Assignment strategy
- Classroom activities strategy
- Feedback strategy
- Reading materials strategy

Most of the instructors employed small assignment strategies in assessment. It is very rare to find a course using exams and projects at the postgraduate level. The reason being students learn better through formative assessment by receiving continuous feedback at different stages of completing the major task assigned in the

course. Students are also better motivated when they can complete each small task on time and improve their learning by receiving a lot of feedback from their instructors. The classroom activities adopted by the instructors were versatile and used many different strategies ranging from discussion, presentation, role play, debate, video clip and group work. With regards to feedback strategy, the findings indicated that one instructor had implemented peer review in her course. Other instructors were using formative assessment strategy and stressed on providing ample feedback to students when they handed in their draft. However, all the instructors had high expectations on the quality of the final draft submitted i.e. it had to be thorough, well-written and free of any mechanical and grammatical errors. Even though most of the instructors only identified two main texts for each course, however, the additional reading materials provided each week to the students were substantive. All the students were expected to finish their readings before they came to class.

10.5 Discussion

One of the ways in which formative assessment can assist in constructive learning as what has been proposed in transformative learning is through the informal assessments in dialogues and interactions during class discussion between the instructor and the students (Ruiz-Primo 2011). According to the instructor interviewed, student performance was evaluated based on the course requirements as stated in the syllabus as well as class attendance/participation, online participation and peer reviewing assessment. Based on Yang and Tsai (2010)'s research on online peer assessment, this type of assessment is beneficial to observe two types of learning the students use; deep learning and surface learning. Student who utilize deep learning and has strong theoretical background knowledge will portray more critical and explicit content than student with surface learning and this can be monitored during online peer assessment. In addition to that, Vile and Buyukduman (2013) has shown how students' autonomy can be developed in active learning with the shift of perspective of the teachers. Teachers should be aware of the innate ability to autonomous learning, skills to monitor, evaluate and make their own decision to follow certain strategies and plans to direct their own learning (Vile and Buyukduman 2013). This shows that active learning is strongly related to independent learning.

Findings from the observation conducted in the class further revealed that the classroom activities applied multiple strategies such as lecture, group discussion and presentation. This finding is parallel to a study conducted by Ruiz-Primo (2011). Among all the strategies, quiz was the least popular strategy and small assignment was the most common strategy used to enhance learning in higher education. This shows that the lecturers prefer the kind of assessment which promotes more autonomous learning such as small assignments compared to the quiz which is more norm-referenced based. D Cherney (2008) suggested that small assignments which require the students to learn inside and outside of the classroom or reflect on the information

enhance active learning among the students which help them to have longer retention memory in their learning.

Based on document analysis of the course syllabi from 12 courses, findings revealed that multiple forms of assessment had been integrated in the assessment of student learning. The forms of assessment comprised case study, short essay, project paper, seminar paper, presentation, portfolio and quiz were listed as assessment modes for most of the courses. However, final exam was only noticed in a post-graduate course relating to educational assessment. This finding indicated that formative assessment has been widely used in the undergraduate and postgraduate courses in the School of Education selected for this study. Formative assessment has been proposed by Black and William (1998a, b) and Popham (2010) to enhance transformative learning and active learning in higher education. According to Ludvigsen et al. (2012), students are found to be more aware of the importance of formative assessment as most of the students who participate in classroom interaction are found to expect critical and constructive feedback in meaningful learning. This proves that student's involvement is crucial in ensuring active learning in higher education. Besides that, Sutton (1995) also writes that "I'd like to be able to say that my conviction about the usefulness of student involvement in assessment sprang from my knowledge of the research findings on the issue, but I confess that it didn't. First and foremost, I believe in involving learners in the assessment process because I myself have found it useful and effective" (p. 131). In Sutton's case, she explains that her conviction is really based on her assumption that teachers should be encouraging learners to become autonomous, and that this 'will not be achieved merely by wishing it so (Sutton 1995: 132). She then lists five further assumptions about what she considers to be the preconditions for successful independent learning and formative assessment (Sutton 1995: 132):

- The learner believes he/she is capable of learning;
- He/She knows enough about himself/herself to set learning targets within his/her extended grasp;
- He/She is willing to make the effort and commitment;
- He/She is aware of different ways of tackling a learning task, and able to make good decisions depending on circumstances and
- He/She is not afraid of failure and knows how to learn from it.

In another case, Morton (1999: 3) in an observation study with 34 fifth graders of an exemplary classroom where active learning was taking place also identified that the classroom was a place where all students were involved in meaningful curriculum, and learning was a realized goal for all. With the result of high level learning obligation and above moderate levels of learning effort and collaboration in learning identified among the students in the classroom, the researchers believes that active learning and formative assessment had been implemented successfully in the classrooms.

10.6 Conclusion

Assessment of student learning, including test, portfolios, projects, papers, and performances, provide information on how well the institution has achieved its goals for student learning, which are the key goals of most institutions of higher education (Suskie 2006: 24–25). Since any one assessment strategy has inherent imperfections, the best evidence of student learning comes from multiple sources (Suskie 2006: 24–25). As Smith and Kosslyn (2007a, b: 151) note: ‘To understand cognition, it is essential to understand knowledge and its ubiquitous presence in all aspects of mental activity’. Hence the use of assessments in higher education is to highlight the understanding of knowledge and its presence in all aspects of mental activity of a person.

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References

- Avci-Vile, D. E., & Buyukduman, I. (2013). Breaking the chains: Autonomous learners. *Procedia-Social and Behavioural Sciences*, 106, 570–575.
- Black, P., & William, D. (1998a). Assessment and classroom learning. *Educational Assessment: Principles Policy and Practice*, 5(1), 7–74.
- Black, P., & William, D. (1998b). *Inside the black box: Raising standards through classroom assessment*. London: School of Education, King’s College.
- Brown S. (2005). Assessment for learning. *Learning and Teaching in Higher Education*, (Issue 1), 83. Retrieved from <http://www2.glos.ac.uk/offload/tli/lets/lathe/issue1/articles/brown.pdf>
- D Cherney, I. (2008). The effects of active learning on students’ memories for course content. *Active Learning in Higher Education*, 9(2), 152–171.
- Dodge, J. (2009). *25 quick assessments formative for a differentiated classroom*. New York: Scholastic Publisher.
- Drummond, T. (1995). *A brief summary of the best practices in college teaching: Intended to challenge the professional development of all teachers*. Retrieved August 13, 2008, from <http://www.fctel.unc.edu/pedagogy/basicscoursedevelop/BestPractices.html>
- Garrison, C., & Ehringhaus, M. (2008). *Formative and summative assessments in the classroom*. Accessed on 28 Nov 2008 from <http://www.nmsa.org/Publications/WebExclusive/Assessment/tabid/1120/Default.aspx>
- Herrington, J., & Oliver, R. (2000). An instructional design framework for authentic learning environments. *Educational Technology Research and Development*, 48(3), 23–48.
- Illinois State Board of Education. (2014). *A sampling of types of formative assessment*. Retrieved March 22, 2014, from http://www.isbe.net/common_core/pdf/da-form-asmt-chart.pdf
- Kvale, S. (2007). Contradictions of assessment for learning in institutions of higher learning. In D. Boud & N. Falchikov (Eds.), *Rethinking assessment in higher education: Learning for the longer term* (pp. 57–71). New York: Routledge.
- Lambert, K. (2012). *OCPS curriculum services*. Retrieved March 3, 2014, from http://www.levy.k12.fl.us/instruction/Instructional_Tools/60FormativeAssessment.pdf

- Ludvigsen, K., Dysthe, O., Kari, S., & Havnes, A. (2012). Formative assessment and feedback: Making learning visible. *Studies in Educational Evaluation*, 38, 21–27.
- Morton, M. L. (1999). *Transforming classrooms through collaborative action research: Helping teachers make learning connections with students*. Unpublished Doctorate thesis, School of Education, Indiana University, USA.
- Olivier, C. (2002). *Let's educate, train and learn outcomes-based*. Ifafi: OBET Pro.
- Popham, W. J. (2010). *Everything school leaders need to know about assessment*. Thousand Oaks: Corwin, A Sage Company.
- Quellmalz, E. S., & Kozma, R. (2003). Designing assessments of learning with technology. *Assessment in Education*, 10(3), 389–407.
- Reeves, T. C. (2006). How do you know they are learning? The importance of alignment in higher education. *International Journal of Learning Technology*, 2(4), 303. Retrieved January 8, 2014, from <http://net.educause.edu/ir/library/pdf/eli08105a.pdf>
- Reeves, T. C., & Hedberg, J. G. (2003). *Interactive learning systems evaluation*. Englewood Cliffs: Educational Technology.
- Regier, N. (2012). *Book two: 60 formative assessment strategies*. Regier Educational Resources. Retrieved June 4, 2014, from www.regiereducationalresources.com
- Ruiz-Primo, M. A. (2011). Informal formative assessment: The role of instructional dialogues in assessing students' learning. *Studies in Educational Evaluation*, 37, 15–24.
- Shipman, D., Aloï, S. L., & Jones, E. A. (2003). Addressing key challenges in higher education assessment. *Journal of General Education*, 52(4), 335–346.
- Smith, E. E., & Kosslyn, S. M. (2007a). *Cognitive psychology: Mind and brain*. Upper Saddle River: Prentice Hall.
- Smith, E. E., & Kosslyn, S. M. (2007b). *Cognitive psychology: Mind and brain*. Upper Saddle River: Pearson/Prentice Hall.
- Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. *Kappan Professional Journal, Phi Delta Kappa International*. Retrieved June 6, 2002, from www.pdkintl.org/kappan/k0206sti.htm
- Stiggins, R., & Chappuis, J. (2006). What a difference a word makes: Assessment FOR learning rather than assessment of learning helps students succeed. *Journal of Staff Development*, 27(1), 10–14.
- Suskie, L. (2006). Accountability and quality improvement. In P. Herson, R. E. Dugan, & C. Schwartz (Eds.), *Revisiting outcomes assessment in higher education*. Westport: LIBRARIES Unlimited.
- Sutton, R. (1995). *Assessment for learning*. Salford: RS Publication.
- William, D. (2007). *Five key strategies for effective formative assessment*. National Council of Teachers Mathematics, Retrieved March 8, 2014, from http://www.nctm.org/uploadedFiles/Research_News_and_Advocacy/Research/Clips_and_Briefs/Research_brief_04_-_Five_Key%20Strategies.pdf
- Yang, Y. F., & Tsai, C. C. (2010). Conceptions of and approaches to learning through online peer assessment. *Learning and Instruction*, 20(2010), 72–83.

Chapter 11

Learning Fractions

Teoh Sian Hoon, Nurul Amira Yaakob, and Parmjit Singh

Abstract Knowledge of the basic concepts of fractions is essential for students to understand other important mathematics topics such as algebraic operations. Hence, the emphasis on examining students' ability in applying such basics would help teachers to assist students in exploring other important mathematical ideas in problem solving. Thus, this study was conducted to investigate students' learning abilities about fractions. Specifically, a paper and pencil test was conducted among the students to obtain data. The population of this study was lower form students from 17 secondary schools in Shah Alam, Malaysia. The sample consisted of 60 students who were randomly chosen from the selected schools. The students had a transaction of prerequisite knowledge on fractions. The investigated knowledge of fractions was categorized into: (1) knowledge of characteristics of fractions, (2) knowledge of operations of fractions, and (3) knowledge of problem solving. The findings revealed that knowledge of characteristics of fractions had positive linear relationship with knowledge of operation of fractions. However, the results showed that there was no relationship between characteristics of fractions with the problem solving of fractions. On the other hand, there was a stronger positive relationship between operations of fractions and problem solving of fractions. Students who understood well the operations of fractions were also able to solve problem solving questions.

Keywords Fractions • Learning • Mathematics

11.1 Introduction

Students' readiness in solving mathematical problems and exploring knowledge of mathematics can be observed from their engagement in mathematics classrooms. The students will be mentally ready to solve mathematical problems if their

T.S. Hoon (✉) • N.A. Yaakob • P. Singh
Faculty of Education, University Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: teohsian@salam.uitm.edu.my

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acquisition of mathematical knowledge is sufficient. They can communicate mathematically and hence control mathematical cognition during the solving of mathematical problems. Hence, the acquisition of important fundamentals of mathematical concepts is essential. The basis of fractions is an important topic in primary schools. The acquisition of the whole number and the concept of fractions is one of the most challenging sections for students to cope with. During this time, students have to think critically to engage themselves in mathematical thinking.

The acquisition of mathematical knowledge provides an opportunity for students to develop mathematical thinking and to achieve a competency level in mathematics. For example, acquisition of knowledge of fractions is required to develop mathematical thinking especially for the concepts and the whole of certain quantity, namely characteristics and properties of fractions.

The importance of mathematical thinking development is not only depicted in the Malaysian Mathematics syllabus but also focused on in mathematics education globally as the fields of science, technology, engineering and mathematics (STEM) demand considerable knowledge of fractions (Bruce et al. 2013). Specifically, the aim of secondary school Mathematics in Malaysia is to develop mathematical thinking among individuals and to be able to use mathematical knowledge effectively and maturely in terms of decision making and solving problems (Rosnani, 2003). This illustrates that Mathematics education strives to expand mathematical thinking so that students can make decision for every action in solving problems.

Referring to the secondary school syllabus that is prepared by Ministry of Education, mathematics generally focuses on the independence of students' ability to face challenges in terms of solving problems that arise due to the advancement of science and technology. Specifically, mathematics curriculum for secondary schools emphasizes on promoting lifelong learning among students from Form 1 until Form 5. The content is categorized into three areas which will be covered throughout the process of learning Mathematics in 5 years. The areas are numbers, shapes and space, and also the relationship among the areas. This enables students to understand the concepts of counting, relationship and measurement. However, some of the topics taught during early secondary school specifically in Form 1 are continuous from the primary school syllabus. This situation implies that students should have acquired knowledge of certain topics such as fractions and percentages. Hence, in order to enhance the quality of teaching, teachers should plan effective methods of teaching so that students can maintain and improve their acquisition of such knowledge.

Since mathematics is related to solving problems, teachers should be more concerned about the way students think. The process of how students understand their learning is illustrated in their thinking process. During this time, teachers have to guide the students and try to give as much as they can so that the students can continuously remember and understand their learning better.

11.2 Background of the Study

Secondary school students have learned fractions during primary school, but they still do not have enough understanding of the subject. According to Noraini and Lathe (2011), fractions is the most frustrating topic in mathematics lessons. This implies that students' level of knowledge should be further surveyed. The problem arises when students face difficulties in comprehending fractions, yet, they cannot recognize the specific difficulties they face. Analysing students difficulties is necessary for teachers to determine students thinking towards solving problems as well as understanding fractions and the topics related to fractions.

It is crucial that the knowledge of fractions is built from the parts of whole concept (Cramer & Whitney, 2010). This is a general concept of fractions that is usually used by teachers during discussion of fractions in classrooms. On the other hand, the concepts of part-whole relationship is also taught in other topics too. For example, Paul et al.(2007) determine students understanding about percentages as whole part by measuring students understanding of fractions as a whole part in a given fraction. Specifically, if a numerator is 'a' and a denominator is 'b' which is presented as a/b , then the whole part is 'b', that is, the whole part has been divided into 'b' pieces. Then, the whole part becomes 100 % or b represents 100 %. Both topics of fractions and percentages are similar in terms of concept as discovered from previous research. Meanwhile, Moss and Case (1999) presented the success of teaching decimals and fractions among Grade 4 students based on the use of students' knowledge of percentages only. This depicts that both fractions and decimals are related to percentages. However, problems emerge when students are not conscious about the similarities that contribute to the existence of relationship among the topics. On the other hand, knowledge of fractions is important to be understood by students so that they can generate other mathematical ideas and understanding for long term. Referring to the curriculum specifications of mathematics for secondary school itself, there are a lot of concepts in fractions to be learnt. Students have to struggle to master the overall subtopics of fractions especially those on conceptual understanding. The knowledge of the basic concept of fractions can help students to understand other important topics such as algebraic operations and other number types (Kaur and Pumadevi 2009). Hence, examining students' ability in applying the basics is important to help teachers further prepare students in exploring other important mathematical ideas in problem solving. Thus, this study was conducted to investigate students' learning of fractions. This study also focused on exploring the relationship among different concepts in fractions.

11.3 Research Objectives

This study was conducted to investigate secondary school students' learning abilities on fractions. Specifically, the objectives of this study were:

1. To examine the students' overall achievement in knowledge of fractions.
2. To examine the students' achievement in specific knowledge of fractions, namely knowledge of defining the characteristics of fractions, knowledge of conducting operations with fractions and knowledge of solving problems of fractions.
3. To investigate the relationship among the students' achievements in different types of knowledge of fractions.

11.4 Methodology

A correlation research was employed for investigating the relationship of the students' achievement of knowledge in the topic of fractions. The population of this study was seventeen secondary schools in Shah Alam, Malaysia. The sample consisted of 60 lower secondary students who were randomly chosen from the selected schools. The students had a transaction of prerequisite knowledge in fractions. The instrument was a paper and pencil test which consisted of 20 questions on fractions. The specifications of the instrument for a paper and pencil test were based on the Mathematics Syllabi as depicted below:

- (i) Understand and use the knowledge of fractions as part of a whole
- (ii) Understand and use the knowledge of equivalent fractions
- (iii) Understand the concept of mixed numbers and their representations
- (iv) Understand the concept of proper fractions and improper fractions
- (v) Understand the concept of addition, subtraction, multiplication and division in solving problems
- (vi) Perform computations involving combined operations of addition, subtraction, multiplication and division of fractions to solve problems

The above contents of knowledge were divided into three major types of knowledge for the investigation in this study. The types of knowledge as indicated in the objective two of the study are knowledge on defining the characteristics of fractions (content i, ii, iii and iv as indicated in the Mathematics syllabi), knowledge on conducting operations with fractions (content v as indicated in the syllabi) and knowledge on solving problems of fractions (content vi as indicated in the syllabi).

Table 11.1 Achievement in overall knowledge of fractions

	N	Mean	Std. deviation	Std. error mean
Frac_total (total mark = 65)	60	50.8000	8.74459	1.12892

Table 11.2 Achievement in 'defining characteristics of fractions'

	N	Mean	Std. deviation	Std. error mean
Frac_Charac (Overall mark = 24)	60	18.8333	3.38074	.43645

11.5 Findings

The findings are discussed based on the research objectives. They are divided into three main findings as below:

11.5.1 *Finding 1: Students' Overall Achievement in Knowledge of Fractions*

The following results show the students' overall knowledge of the topic of fractions.

Table 11.1 illustrates the students' achievement for the topic of fractions in terms of mean score. The mean score was 50.800 with standard deviation of 8.74459. The t-test ($t=15.767$) with $p<0.05$ indicated the mean score for the knowledge of fractions ($mean=50.8$) was significantly higher than the test value or middle score ($middle\ score=32.5$). This analysis provided evidence that the students' achievement of the topic of fraction was relatively higher than the middle score.

11.5.2 *Finding 2: Students' Achievement in Specific Knowledge of Fractions*

The specific knowledge of fractions refers namely to:

- knowledge in defining the characteristics of fractions,
- knowledge in conducting operations with fractions, and
- knowledge in solving problems of fractions.

The following results illustrate the students' achievement in different types of knowledge in the topic of fractions.

Table 11.2 shows the students' achievement in defining characteristics of fractions in terms of mean score. The mean was 18.8333 with the standard deviation 3.38074. The t-test ($t=15.657$) with $p<0.05$ indicated the mean score for knowledge of defining

Table 11.3 Achievement in ‘conducting operations with fractions’

	N	Mean	Std. deviation	Std. error mean
Frac_Operation (total mark = 15)	60	13.0333	2.32136	.29969

Table 11.4 Achievement in ‘solving problems on fractions’

	N	Mean	Std. deviation	Std. error mean
Frac_Prob Solv (total mark = 26)	60	18.9333	5.67739	.73295

characteristics of fractions (*mean score* = 18.883) was significantly higher than the test value or middle score (*middle score* = 12). This analysis provided evidence that the students’ achievement in ‘defining characteristics of fractions’ was relatively higher than the middle score.

Table 11.3 illustrates the students’ achievement in conducting operations with fractions in terms of mean score. The mean was 13.0333 and the standard deviation was 2.32136. The t-test ($t=20.132$) with $p<0.05$ indicated the mean score for the knowledge of conducting operations of fractions (*mean score* = 13.0333) was significantly higher than the test value or middle score (*middle score* = 7.5). This analysis provided evidence that the students’ achievement on ‘conducting operations of fractions’ was relatively higher than the middle score.

Table 11.4 indicates the students’ achievement in solving problems on fractions in terms of mean score. The mean score was 18.9333 with standard deviation of 5.67739. The t-test ($t=8.095$) with $p<0.05$ indicated the mean score for the knowledge of solving problems in the topic of fraction (*mean score* = 18.933) was significantly higher than the test value or middle score (*middle score* = 13). This analysis provided evidence that students’ achievement in ‘solving problems on the topic of fractions’ was relatively higher than the middle score.

11.5.3 *Finding 3: The Relationship among the Students’ Achievements in Different Types of Knowledge of Fractions*

The following results illustrate the relationship among the students’ achievement in different types of knowledge of the topic of fractions. For this part, the emphasis of the analysis was on the skills involved in fractions which are defining characteristics, operations of fractions and problem solving of fractions. The overall skill was also included in the results.

According to Table 11.5, the magnitude of the correlation between ‘characteristics of fractions’ and ‘operations of fraction’ was $r=0.266$ with $p<0.05$, (p -value = 0.040). This illustrated that ‘characteristics of fractions’ had positive linear relationship with ‘the operation of fraction’. The knowledge of ‘the characteristics

Table 11.5 Analysis of correlation for the defining characteristics of fractions, operation of fractions, problem solving of fractions and overall knowledge of fractions

		Frac_Charac	Frac_Operation	Frac_ProbSolv	Frac_total
Frac_Charac	Pearson correlation	1	.266*	.203	.589**
	Sig. (2-tailed)		.040	.119	.000
	N	60	60	60	60
Frac_Operation	Pearson correlation	.266*	1	.585**	.748**
	Sig. (2-tailed)	.040		.000	.000
	N	60	60	60	60
Frac_ProbSolv	Pearson correlation	.203	.585**	1	.883**
	Sig. (2-tailed)	.119	.000		.000
	N	60	60	60	60
Frac_total	Pearson correlation	.589**	.748**	.883**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	60	60	60	60

of fraction’ was related to the knowledge of ‘the operation of fractions’; however, the results showed that there was no relationship between knowledge on ‘characteristics of fraction’ with ‘problem solving of fractions’. A stronger positive correlation was also shown between ‘the operation of fractions’ and ‘problem solving of fractions’, i.e., $r=0.585$ with $p<0.05$ (p - value= 0.000). The results depicted that knowledge of ‘the characteristics of fractions’ was not enough for further solving of mathematical problems in fractions. Nevertheless, the findings revealed that ‘the characteristics of fractions’ had a positive linear relationship with ‘the operation of fractions’. On the other hand, there was a stronger positive relationship between ‘the operations of fractions’ and ‘problems solving of fractions’ if compared to the relationship between ‘the characteristics of fractions’ and ‘the operation of fractions’. Even though there was no direct relationship between knowledge of ‘characteristics of fractions’ with ‘problem solving of fractions’, the level of knowledge of ‘the operations of fractions’ was related to the level of knowledge of ‘the characteristics of fractions’; hence, indirectly, the knowledge of ‘the characteristics of fractions’ is essential for solving mathematical problems in the topic of fractions. The following results show the importance of applying knowledge of property ‘the fraction is part as whole’ and property of ‘equivalent fractions’ as tested in question 6 of the test. Question 6 is stated as follows:

Ali received RM120 from his mother. He had spent RM40 to buy a few books. Ahmad received RM210 from his father and he had also used the money to buy some books. The fraction of amount of money Ali spent from his collection is equal to the fraction of amount money Ahmad spent from the money given by his father. How much had Ahmad spent?

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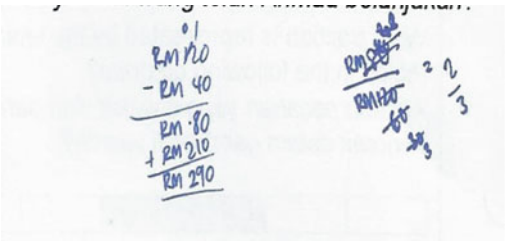


Fig. 11.1 A sample work for question 6

The working of a respondent (as below) involved operations of whole numbers from the indicated amount of money (RM120, RM40 and RM210) (Fig. 11.1).

The respondent's reflection had indicated that the required knowledge was not related to the solution for the question. The operations were conducted without knowledge of the characteristics of fractions. The reflection was stated as below:

because RM120 Ali gets from his mother. RM40 is the amount of he spend to buy the books. After he buy the books, he received the money from his father.

11.6 Discussion and Conclusion

The learning contents of fractions were classified into three skills which are characteristics of fractions, operations of fractions and problem solving of fractions. The entire skills illustrated that students have relatively higher achievement compared to the middle scores of the contents of each particular skills. The students are able to achieve the required level of knowledge on 'the characteristics of fractions', namely more than the middle score in terms of proper fractions, improper fractions, mixed numbers and fractions as part of whole. This result is consistent with the findings by Wong and Pumadevi (2009). They found that students can easily master knowledge of characteristics of fractions which include proper and improper fractions. The achievement of knowledge also included solving problems in mathematics using representations in pictures and symbols. Besides, the learning of proper fractions is

essential for the understanding of “part of whole” concept. The importance of learning fractions is seen in the emphasis on the multiple ways of learning, such as representation of diagrams. Learning fractions is crucial since it is related to many other topics. The findings of this study show that the students are ready in applying part whole thinking. The understanding of the characteristics of fractions and the related knowledge such as part whole thinking is essential in order to determine the values of fractions (Fisher 2009; Haser and Ubuz 2003).

Referring to the operation of fractions, the students also achieve the required level of achievement. A previous study by Aksu (1997) stated that for the operations of fractions, students shows good achievement but they have higher performance on the concept of addition rather than the concept of multiplication. The results indicate that student are knowledgeable to solve operations of fractions. On the other hand, the findings of this study also indicate that there is a relationship between knowledge of ‘the characteristics of fractions’ and ‘the operation of fractions’, but there is no relationship between knowledge of ‘the characteristics of fractions’ and ‘problem solving in fractions’. It is important to master the basic knowledge of fractions, namely ‘the characteristics of fractions’, but the mastery of knowledge is not enough since there is positive relationship between ‘conducting operation of fractions’ and ‘problem solving in fractions’. These results are corroborated by previous studies which found that students are good in conducting operations in solving mathematical problems (Haser and Ubuz 2003).

Although the focus on computation and operation of fractions is important for solving mathematical problems, students should learn more of the techniques of solving mathematical problems specifically since in many contexts, students face difficulties in solving mathematical problems rather than computation of fractions (Aksu 1997; Azlina et al. 2008).

References

- Aksu, M. (1997). Student performance in dealing with fractions. *Journal of Educational Research*, 90(6), 375–380.
- Azlina, A., Siti Salwah, S., & Roziati, Z. (2008). A cognitive tool to support mathematical communication in fraction word problem solving. *WSEAS Transactions on Computers*, 7(4), 228–236.
- Bruce, C., Chang, D., Flynn, T., & Yearley, S. (2013). *Foundations to learning and teaching fractions: Addition and subtraction*. Retrieved July 4, 2014, from <http://www.edugains.ca/resources/ProfessionalLearning/FoundationstoLearningandTeachingFractions.pdf>
- Fisher, J. (2009). Partitioning and the part-whole concept. *Set: Research Information for Teachers*, 2, 12–19.
- Haser, Ç., & Ubuz, B. (2003). Students’ conceptions of fractions: A study of 5th grade students. *H U Journal of Education*, 24, 64–69.
- Kaur, K., & Pumadevi, S. (2009). Examples and conceptual understanding of equivalent fractions among primary school students. In *Third International Conference on Science and Mathematics Education (CoSMEd)*, Penang, Malaysia.

- Moss, J., & Case, R. (1999). Developing childrens' understanding of the rational numbers: A new model and experimental curriculum. *Journal for Research in Mathematics Education*, 30(2), 122–147.
- Noraini, I., & Lathe, M. (2011). Error pattern in addition and subtraction of fractions among form two students. *Journal of Mathematics Education*, 4(2), 35–54.
- Paul, W., Sue, W., Rhonda, F., & Mike, M. (2007). Percentages as part whole relationships. In J. Watson, & K. Beswick (Eds.), *Proceeding of the 30th annual conference of the Mathematics Research Group of Australia* (Vol. 1, pp. 805–814). Sydney: MERGA.
- Rosnani, H. (2003). Malaysian teachers' attitude competency and practices in the teaching of thinking. *Intellectual Discourses*, 11(1), 27–50.
- Wong, L., & Pumadevi, S. (2009). The conceptual understanding of fractions as part of set among year 5 students. In *Third International Conference on Science and Mathematics Education (CoSMEd)*, Penang, Malaysia.

Chapter 12

Teaching Complex Theoretical Subjects Using Digital Game-Based Learning in the Faculty of Creative Industries, UTAR

Wan Irma Sabrina Idris, Hasleena Hamzah, Abdul Malik Ahmad, and Suhaila Zaki

Abstract Base on the constructivist theory of education, digital game-based learning (DGBL) can be applied to most subjects and skill level as it has the ability to connect educational content via computer technology and games. This review explores the differences between an established delivery method- (lectures and tutorials) and interactive delivery method- (collaborative learning and game-based study material) that conveys theoretical content for tertiary level subject. Results from this research will determine the learning outcome of individual students. The study investigates the effectiveness of a collaborative learning environment where students contribute to the game-based study tool design content which aids in their study of complex and theoretical content. This provides them a platform to collaborate and use familiar devices such as the Internet, discussion group and game-based study tools. A pre-test paper and questionnaire of the content area will assist in determining the outcome of the students' performance scores from each group (traditional vs collaborative).

Keywords Digital game-based learning • Teaching • Theoretical subjects

12.1 Introduction

The learning process should be interesting, easy and fun. Despite having an association with children, fun and informal education; game- based learning is a new educational approach for universities to encourage lifelong learning.

W.I.S. Idris (✉) • H. Hamzah • A.M. Ahmad • S. Zaki
Faculty of Creative Industries, Universiti Tunku Abdul Rahman,
47300 Petaling Jaya, Selangor, Malaysia
e-mail: sabrina@utar.edu.my; hasleena@utar.edu.my;
malik@utar.edu.my; suhailaz@utar.edu.my

How does game-based learning fit into all of this? Games today mainly comprise the virtual environment- filled with realistic graphics, engaging characters and dynamic storyline where players can control. Klopfer et al. (2009), quotes that the promise of games is that we can harness the spirit of play to build new cognitive structures and ideas of substance. Game-based learning generally refers to the use of video games to support teaching and learning. The intention of game-based learning is to discover an academic and ICT (information and communications technology) approach to learning whilst providing learners a platform to acquire skills and competencies in the working world. Through game-based learning, learners are exposed to challenges and are required to solve tasks virtually.

Though pedagogy and game design appears to be two separate worlds, an emerging number of literatures emphasize the importance of establishing instructional strategies and theories to design educational games and facilitate game-based learning. Based on the perception above, together with the inherent learning environment, state-of-the-art facilities and infrastructure, this research attempts to investigate the usage of digital game-based learning as an instrument in teaching complex theoretical subjects in tertiary education. The investigation is tested on a subject offered by the Faculty of Creative Industries in Universiti Tunku Abdul Rahman.

The aim of this research is to develop a new teaching material that uses ICT to teach complex theoretical subject in the Faculty of Creative Industries, UTAR.

The research has three main objectives: (1) investigate the use of collaborative learning environment that has students contribute to the game-based study tool designed content, (2) examine the effectiveness of game-based study tool via complex theoretical content and students' final assessment, and (3) provide a guideline for educators and game designers in developing a game-based teaching material for future classes.

The research hypothesis will discover if students in the Faculty of Creative Industries, UTAR learns theoretical subject better and faster when game-based learning method is applied in comparison to conventional lecturing method.

12.2 Conceptual Framework

The proposed game-based learning framework can be used to map out the design of new/existing games and act as an evaluation tool too. If a current game design lack features found in the framework, it can aid in finding those features and improvise accordingly. Game designers will determine the game design starting with the learning column, followed by the instruction column and finishing with an assessment. The learning column needs to define the learning objective, player's goal and the learning content. In the instruction column, attention is paid to the learning cycle, consisting of the user behaviour, feedback, engagement and learning. The instructional design is a platform where user's action provides sufficient feedback and triggers engagement that leads to learning. The assessment column gathers three

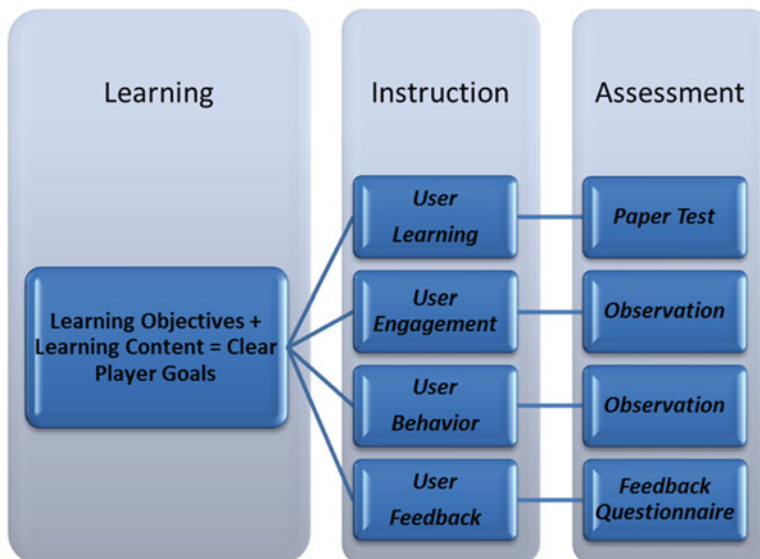


Fig. 12.1 Game-based learning framework

variants; testing, observation and feedback. It leads to learning outcomes where game players are surrounded by a specific educational context (Fig. 12.1).

12.3 Method

This research adopts a mixed method research design where the collection and analysis of data uses qualitative and quantitative methods in a single study (Creswell and Clark 2001). Survey interviews with open-ended questionnaires were conducted during five lectures within the Faculty of Creative Industries, UTAR. The purpose of the survey is to discover challenges encountered while teaching complex theoretical subjects, particularly on a specific subject or course where most students may have difficulty in understanding. Naturalistic researchers believe that gaining knowledge from sources that have ‘intimate familiarity (Lofland 1976) with an issue is far better than the “objective” distancing approach that supposedly characterizes quantitative approaches (Marlow 1993). Qualitative approach was conducted to collect data that identify problems and, gather opinions about the research. Interview with respondents are recorded, and the results will influence the design of the prototype.

The course that was selected was the- UJMD2143- Animation a compulsory course for Graphic Design and Multimedia students offered in Year 2 and 3. Four topics were selected from that course based on the results of the initial interviews. Once the game based-learning material prototype was designed, it was test on 120 students who took the course.

Students were divided into 2 groups. Group A were taught via the conventional lecture method while Group B was taught using the game – based learning material. After the four sessions, students from both groups were given the same test but for Group B, they were provided with close-ended questionnaire after the test. These questionnaires were distributed to garner feedback from students who have participated in the game-based learning method.

The research instruments used to interview lecturers are open-ended questionnaire. Open-ended questions allow the respondent to express his/her answer in detail, but are more challenging to analyse. For the prototype survey questionnaire, close-ended questions were used. Close-ended questions have a definite set of answers where respondent selects. One of the choices is ‘Other’ as it gives respondents the option to write down their personal response. Close-ended questions are easier to standardize and can provide statistical analysis (Fink 1995).

12.4 Findings

Below is the feedback from five lecturers who had experience in teaching the subject:

Lecturer 1: “Most students tend to fall asleep after 15 min of my lecture class if the topic that I had to cover that day is too complex and theoretical.”

Lecturer 2: “Those students who are taking this subject are graphic & multimedia students, therefore without any interesting visuals, sound and interactivity; they would get bored easily.”

Lecturer 3: “My students prefer my lecture slides to be full of pictures, videos and animation. If there is an application that I can use to make my lectures more interesting and interactive, I would definitely need one.”

Lecturer 4: “Nowadays, students are engaged with technology in every second of their daily life. Game-based learning might be the answer for future teaching and learning.”

Lecturer 5: “I would probably be interested and adopt game-based learning (GBL) into my lecture but the only thing that concerns me is if there is any easier way for lecturers to add and update their own teaching content into GBL as how we are doing with our power point presentation?”

The lecturers’ feedbacks were used to develop the four intended topics that are considered as the students’ least favourite subject. Also, the developed GBL must be made available on all platforms, mainly via computers and are accessible for lecturers to add in their own content when necessary.

Below are the bar charts showing the results of the test paper between Group ‘A’ who attended the conventional lecturing class and Group ‘B’ who attended the game-based learning class. Total number of students for each group is 60. Based on the chart, 5 students from Group A achieved an ‘A’ score while Group B shows a higher number of 16 students. There are also an increasing number of students

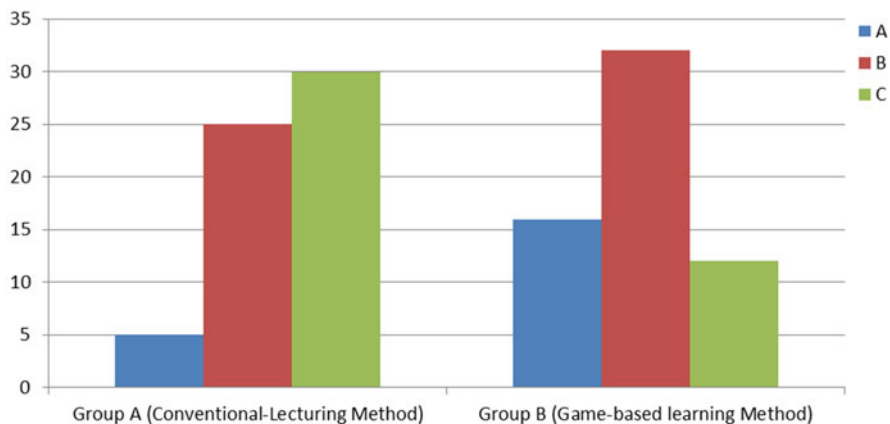


Chart 12.1 Bar chart shows the paper test result between Group A and Group B

achieving a ‘B’ score with 25 from Group A and 32 from Group B. Meanwhile, the number of ‘C’ score from Group A is 30 and Group B is 12 (Refer Chart 12.1).

Group B were given a close-ended questionnaire to garner their feedback about their experience with game-based learning method (Peterson 2000).

12.5 Results and Discussion

The data analysis from the questionnaires and interviews contributed substantially to the findings of this research. Based on the objectives of the research, data gathered were analysed and reported as below:

Objective 1: Investigate the use of collaborative learning environment that has students contribute to the game-based study tool designed content.

Results from the study shows that 82 % of the participants (students) felt that the experienced garnered from the game-based learning method are more interesting than the conventional teaching method (Refer Chart 12.2).

96 % of the survey result demonstrates the students’ preference towards game-based learning method to learn theoretical subjects (Refer Chart 12.3), and 60 % of the participants agree that playing game-based learning materials catches their attention and make them understand the content better (Refer Chart 12.4).

Objective 2: Examine the effectiveness of game-based study tools via the complex theoretical content and the students’ final assessment

Comparing the results of their mid-term (Group A-conventional lecturing method and Group B-game-based learning method), results of game-based learning for ‘A’ and ‘B’ score increased by 18 % and 11 % respectively while ‘C’ score decreased by 30 % (Refer Chart 12.1).

After tried the game-based teaching materials, how do you feel on overall of the experience?

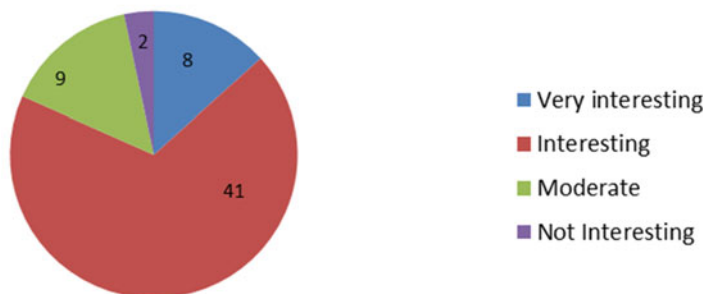


Chart 12.2 Pie chart shows feedback from students who experienced game-based learning method

If you are to choose in learning your theoretical subjects, which method of teaching would you prefer to be implied in these subjects?

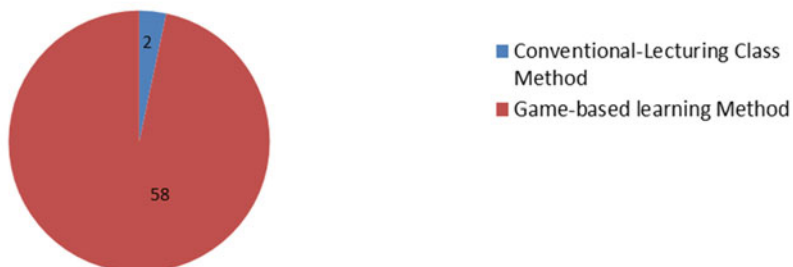


Chart 12.3 Pie chart shows the student preference after trying out game-based learning method

After tried the game-based teaching materials, how much do you understand those topics given?

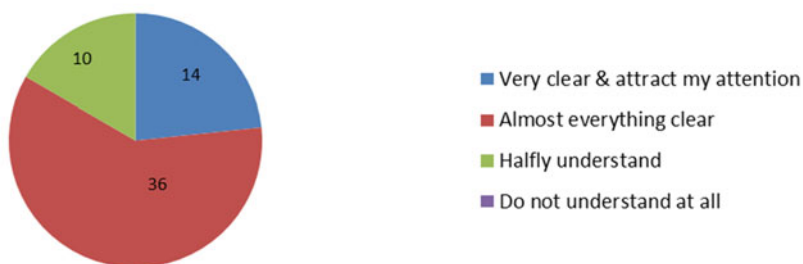


Chart 12.4 Pie chart shows students feedback on their understanding of content

If the game-based teaching materials to be improve in the future, what aspect should the improvement be focus on?



Chart 12.5 Pie chart shows students feedback on how to improve the content of game-based learning

Objective 3: Provide a guideline for educators and game designers in developing game-based teaching materials

Results from the user feedback (close-ended questionnaire), shows the need and interest of the user to participate in this research. 40 % of the users (students) would like an improvement in the design, 30 % of the users selected content, while 25 % of the users highlighted the difficulty level of the subject. Only 5 % requested for the user interface to be improved (Refer Chart 12.5).

12.6 Conclusion

In order to successfully implement the game-based learning method for complex theoretical subjects, further research and development is imperative, particularly in the area of content, necessity and technology (Refer Chart 12.5). Based on the information gathered and with proper technology training, lecturers are capable of designing their own game-based learning material.

“The key to a good educational design, whether in regular courses or in serious games, is to achieve alignment and balance between the learning, instruction, and assessment aspects” (Bisso and Luckner 1996). This means that despite having set the instructions for the prototype based on the learning objective, the assessment needs to show if the participant (students) has effectively learned the subject. Based on the prototype testing and survey, most of the respondents had a positive experience and were keen to learn more from this method.

This research proved that digital game-based learning provide motivation for learning subjects that are very complex or theoretical to teach due to the nature of the subject that is dull or complicated. The method provides user a fun and interactive experience, which engage users with the subject matter. Once learners are motivated, a number of elements have been discovered that accelerates the effectiveness of

learning including questioning, problem solving, and multiple senses feedback and reinforcement, challenge, involvement and relevance of “doing,” through simulation and cognitive apprenticeship.

The role of the learner is critical in bridging the gap between the game designs and learning tools. While new research studies have demonstrated the efficiency of accelerating and providing personalised learning via serious games in comparison to traditional learning method, there is a significant amount of proper installation framework and learning-driven game design strategy required. The approach has the potential of revolutionising the game content and education industry.

Acknowledgements Conducting this research has always been a fascinating experience and journey for us. My greatest gratitude goes to UTAR Research Fund for funding this research. I would also like to thank my co-researchers who have been with me through the ups and downs while working on this paper. Finally, thank you to all the students who participated in this research. Without their full support and sincere feedback, this research would not have made it on time.

References

- Bisso, C., & Luckner, J. (1996). Fun in learning: The pedagogical role of fun in adventure education. *The Journal of Experiential Education*, 19(2), 108–112.
- Creswell, J. W., & Clark, V. L. (2001). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks: Sage.
- Fink, A. (1995). *How to ask survey questions* (Vol. 2). Thousand Oaks/London: Sage Publications.
- Klopfer, E., Osterweil, S., & Salen, K. (2009). *Moving learning games forward*. The Education Arcade, Massachusetts Institute of Technology. Available at http://education.mit.edu/papers/MovingLearningGamesForward_EdArcade.pdf
- Lofland, J. (1976). *Doing social life: The qualitative study of human interaction in natural settings*. New York: Wiley.
- Marlow, C. (1993). *Research methods for generalist social work* (2nd ed.). Pacific Grove: Brooks/Cole Publishing Company.
- Peterson, R. A. (2000). *Constructing effective questionnaires*. Thousand Oaks/London: Sage Publications.

Chapter 13

Factor Structure of Statistics Anxiety Rating Scale (STARs): EFA and CFA Using Malaysian Undergraduate Psychology Students

Harris Shah Abd Hamid and Muhamad Karimi Sulaiman

Abstract Statistics courses are very important for social science students in understanding and analyzing research. Many students felt that statistics course is not applicable for undergraduate study except for pursuing postgraduate degrees. A study conducted in a Malaysian university found a negative relationship between anxiety and academic performance (Abd Hamid HS, Sulaiman MK, *Int J Behav Sci* 9(1):55–66, 2014a). However, the factor structure of the anxiety measure (STARs) had not been examined for Malaysian sample. This paper seeks to examine the factor structure of STARs which was reported to have six factors (Worth of Statistics, Interpretation Anxiety, Test and Class Anxiety, Computational Self-concept, Fear of Asking for Help, and Fear of Statistics Teachers) measured by 51 items. The scale was distributed to 132 undergraduate psychology students (26 males, 106 females) who took Psychological Statistics course. Exploratory factor analysis and confirmatory factor analysis were performed using SPSS and in AMOS respectively. The resulting model comprises five factors with 27 items. The six factors were not successfully replicated in the Malaysian sample; notably, the Interpretation Anxiety is missing. The findings are discussed in relation to the factor structure of another measure (Statistical Anxiety Scale) which was also tested in a Malaysian Sample (Abd Hamid HS, Sulaiman MK, Statistics anxiety, basic mathematics skills and academic performance among undergraduate psychology students. In *Proceedings of the Asian conference on psychology & the behavioral sciences*, 28–30 Mar 2014, Osaka, Japan, pp 452–463, 2014b).

Keywords Factor structure • Psychology students • SEM • Statistics anxiety

H.S. Abd Hamid (✉) • M.K. Sulaiman
Department of Psychology, International Islamic University Malaysia,
Gombak, Kuala Lumpur 53100, Malaysia
e-mail: harris@iium.edu.my; karimisulaiman@yahoo.com

13.1 Introduction

From a practical point of view, the measurement of statistics anxiety is important to provide baseline information about students' performance in statistics courses. Effective intervention could be conducted by targeting the specific sources of anxiety. Scales that measure statistics anxiety have been developed and validated in different cultures. The focus of this paper is on the applicability of one scale for measuring statistics anxiety in Malaysian context.

A widely used measure of statistics anxiety is Statistical Anxiety Rating Scale (STARS) initially developed by Cruise et al. (1985). The original scale comprise of six factors namely: (a) worth of statistics, (b) interpretation anxiety, (c) test and class anxiety, (d) computational self-concept, (e) fear of asking for help, and (f) fear of statistics teachers. The six factors were replicated with 221 college students in southwestern United States (Baloglu 2002). Even with modification to some of the items, Hanna et al. (2008) replicated the six factors with 650 undergraduate students in the UK. It seems that the English (both American and British) versions of STARS have the same factor structure.

Further research on the scale led to the idea of the existence of a second-order factor: a factor tapping into anxiety (Interpretation Anxiety, Test and Class Anxiety, and Fear of Asking for Help) and another factor tapping into perception and attitude (Worth of Statistics, Computational Self-concept, and Fear of Statistics Teachers). These second-order factors was confirmed in studies with German version of the scale ($n=400$) (Papousek et al. 2012) and Taiwan (77 graduate students) (Hsiao 2010).

The preliminary cross-cultural adaptability of STARS for Malaysian population was demonstrated in Abd Hamid and Sulaiman (2014a) in terms of internal reliability and predictive validity. The present study extends the analysis by examining the factor structure of STARS. This objective is hoped to support further possible applications of STARS for intervention purposes in Malaysian population. If STARS is culturally universal, then a confirmatory factor analysis would yield a six-factor solution in a Malaysian sample.

13.2 Method

The participants and materials used, as well as the data collection procedure are as reported in Abd Hamid and Sulaiman (2014a). Briefly, the researcher distributed STARS to 139 students in three sections of Psychological Statistics course at the beginning of a semester. The surveys were conducted during the class session.

13.2.1 Data Analysis

The data were analyzed by using SPSS (internal reliability, exploratory factor analysis) and AMOS (confirmatory factor analysis). Participants with incomplete answer for any of the 51 items were removed during exploratory factor analysis. Thus, from 139 students, the subsequent analysis was done on responses from 132 students.

13.3 Findings

13.3.1 Internal Reliability of SAS

The results showed that the revised STARs have sufficient internal consistency, with Cronbach alpha (α) value of 0.902. The six factors also have acceptable internal consistency ranged between 0.721 and 0.907. With the adequate internal consistency, the STARs will able to be used in order to examine the factor structure of STARs (Table 13.1).

13.3.2 Exploratory Factor Analysis

The EFA was done on 132 participants after removal of participants with incomplete responses. The extraction method used was Principle Axis Factor using Promax rotation. A preliminary extraction with a forced one factor solution resulted in 19.76 % of variance explained, indicating the lack of Common Method Bias. In the first iteration, the data is shown to be suitable for EFA (adequate sample size – $KMO = .752$, Bartlett's test of Sphericity – $p < .0001$). However, the iteration yielded a 13-factor solution that explains 58.42 % of the variance. According to Beavers et al.'s (2013), 50 % variance explained is acceptable, thus the confirmatory factor analysis was performed using all 51 items.

The pattern matrix in Table 13.2 showed a clustering of items as expected except for T30, T44, W29, W36, W41, and X4 that were grouped with items from a different sub-scale. The Worth of statistics and Interpretation seem to load to factors other

Table 13.1 Internal reliability of full scale and the subscales

	Cronbach alpha	No of items
Full scale	.902	51
Asking	.839	4
Interpretation	.733	11
Self-concept	.818	7
Teacher	.721	5
Worth	.907	16
Exam	.801	8

Table 13.2 Pattern matrix showing factor loadings of items across five factors

	Factor				
	1	2	3	4	5
A3					.688
A16					.890
A19					.870
A23					.638
S25	.632				
S31	.910				
S34	.715				
S38	.426				
S39	.693				
S51	.636				
W33	.569				
W40	.487				
W45	.460				
T32		.647			
T43		.783			
T46		.811			
W47		.663			
W26			.711		
W27			.738		
W42			.673		
W50			.654		
X1				.573	
X8				.796	
X10				.728	
X13				.440	
X15				.527	
X21				.477	
X22				.629	

than the original factors. The researchers decided to eliminate factors which have two items. Thus, from thirteen factors, it became five factors. Interestingly, there are factors that have items from two difference domains. For example, Factor 1 has items loading onto it from the Self-concept and Worth of Statistics domains.

13.3.3 Confirmatory Factor Analysis

The best fitting model is composed of five factors namely Asking (F5), Exam (F4), Worth (F3), Teacher (F2), and Utility (F1 – relabeled factor). Three factors remain intact with their original items. Teacher factor gained an item from Worth while the Utility factor has equal number of items from Worth and Self-concept (Table 13.3).

Table 13.3 STARs' final five factors and their items

Factor	Item number	Item
Utility	W34	Since I have never enjoyed maths I do not see how I can enjoy statistics
	W39	I could enjoy statistics if it were not so mathematical
	S51	I am too slow in my thinking to get through statistics
	W33	I lived this long without knowing statistics, why should I learn it now?
	W40	I wish the statistics requirement would be removed from my academic program
	W45	I cannot tell you why, but I just do not like statistics
Teacher	T32	Most statistics teachers are not human
	T43	Statistics teachers speak a different language
	T46	Statistics teachers talk so fast you cannot logically follow them
	W47	Statistical figures are not fit for human consumption
Worth	W26	I wonder why I have to do all these things in statistics when in actual life I will never use them
	W27	Statistics is worthless to me since it is empirical and my area of specialization is abstract
	W42	I do not see why I have to fill my head with statistics. It will have no use in my career
	W50	I am never going to use statistics so why should I have to take it?
Exam	X1	Studying for an examination in a statistics course
	X8	Doing an examination in a statistics course
	X10	Walking into the room to take a statistics test
	X13	Finding that another student in class got a different answer than I did to a statistical problem
	X15	Waking up in the morning on the day of a statistics test
	X21	Enrolling in a statistics course
	X22	Going over a final examination in statistics after it has been marked
Asking	A3	Going to ask my statistics teacher for individual help with material I am having difficulty understanding
	A16	Asking one of your lecturers for help in understanding the results of statistical calculation
	A19	Asking someone in the computer lab for help in understanding the results of statistical calculation
	A23	Asking a fellow student for help in understanding the results of statistical calculation

The internal reliability of the factors is acceptable as can be seen in Table 13.4. The Alpha Cronbach of the revised factors, albeit with fewer items, is comparable with the values found for the original subscales (see Table 13.1). A second point to be made based on Table 13.4 concerns the correlations among the factors. The Table reveals that Exam and Asking correlate with each other but do not correlate with other factors except for the weaker relationship between Exam and Utility. This correlation matrix points to the possible independence of Exam and Asking from the rest of the scale.

Table 13.4 Inter-factor correlations and internal reliability of STARs' sub-scales

	Asking	Exam	Teacher	Worth	Cronbach alpha	Number of item
Asking					.839	4
Exam	.311**				.808	7
Teacher	.098	.000			.784	4
Worth	.086	-.014	.518**		.817	4
Utility	.049	.174*	.404**	.590**	.866	6

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

13.4 Discussion

The sample tested did not reveal a similar factor structure of STARs had reported by other studies. The six factors of STARs were not replicated in the sample of undergraduate students in Malaysia. Five factors were derived; however, in the structural model (see Fig. 13.1), two factors have regression weights close to zero namely Exam (F4, $\beta < .01$), and Asking (F5, $\beta = .05$). In other words, the two factors do not reliably explain the variances in the total score for the full scale. The finding lends further evidence to the existence of second order factor. For the Malaysian sample, attitude towards statistics and the feelings of anxiety themselves are possible components of statistics anxiety. The inter-correlations among the factors further support the idea of two groupings (second-order factor) of the five factors. The reason they remain in the model could be due to the significant relationship between Examination and Utility. Further test can be made to investigate to what extent fear of Exam and Asking are independent constructs for statistical anxiety.

Fear of interpretation does not appear in the final model; none of the 11 items were included in the final model. The items loaded onto multiple factors, thus making the interpretation difficult. Fear of Interpretation could be seen more as a difficulty than a source of anxiety. Alternatively, the Malaysian sample did not perceive a direct relationship between the Interpretation items (like those that mentioned lottery, advertisement, and journal articles) with statistics. The items tap into the application of statistics in daily life – a fact which may not be apparent to the students. In other words, the items were measuring something else than attitude or anxiety about statistics. Thus, the items do not belong in the full scale.

Abd Hamid and Sulaiman (2014b) found a separation of Examination into two distinct factors in Statistical Anxiety Scale (SAS). However, in the current study, Examination exists as a single factor. The Examination items in STARs do involve events or situations before an examination. However, there were no explicit items addressing the level of preparation for an examination. Thus, the Examination factor in STARs remains as a single factor.

Interestingly, the Asking factor in STARs also remains as a single factor even though its counterpart in SAS was separated into Asking and Private Tutorials. The items that make up Asking in STARs have references to teachers and students.

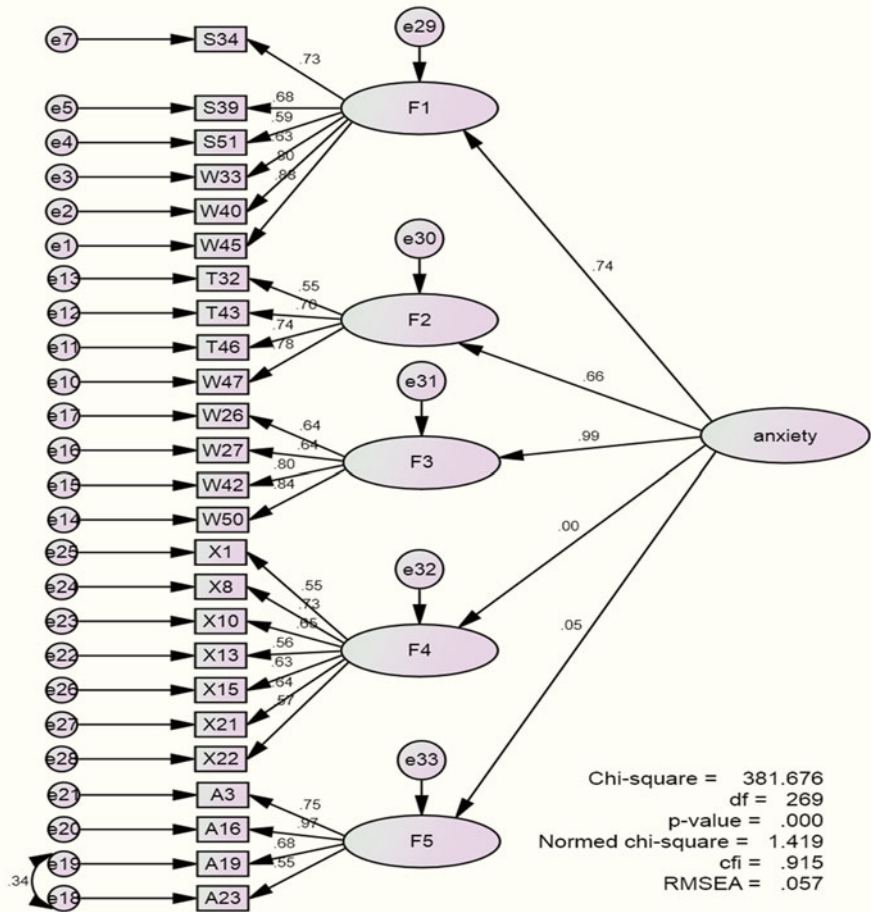


Fig. 13.1 Final structural model of STARs with five factors

Private tutorials with possible financial implications, which were mentioned in SAS, were not mentioned in STARs. Thus, this finding further justifies the labelling of Private Tutorials in SAS.

There seems to be a lack of cross-cultural applicability of STARs in terms of the theoretical structure of statistics anxiety. While the internal consistencies are satisfactory, the factor structure is less convincing. The number of factors found and the close-to-zero weights of two factors to the overall scale suggest STARs may not tap into the same statistical anxiety domains. Similar lack of fit was found in the SAS. Therefore, there seems to be a need to develop an indigenous measure of statistical anxiety. An exploratory study among students who failed a statistics course revealed four external factors related to performance in the course namely lecturers, course administration, environment, and peers (Haque and Abd Hamid 2014). The findings could be used to guide the identification of domains of statistics anxiety for Malaysian population.

References

- Abd Hamid, H. S., & Sulaiman, M. K. (2014a). Statistics anxiety and achievement in a statistics course among psychology students. *International Journal of Behavioral Science*, 9(1), 55–66.
- Abd Hamid, H. S., & Sulaiman, M. K. (2014b, March 28–30). Statistics anxiety, basic mathematics skills and academic performance among undergraduate psychology students. In *Proceedings of the Asian conference on psychology & the behavioral sciences* (pp. 452–463). Osaka, Japan.
- Baloglu, M. (2002). Psychometric properties of the statistics anxiety rating scale. *Psychological Reports*, 90(1), 315–325.
- Beavers, A. S., Lounsbury, J. W., Richards, J. K., Huck, S. W., Skolits, G. J., & Esquivel, S. L. (2013). Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment, Research & Evaluation*, 18(6). Available online: <http://pareonline.net/getvn.asp?v=18&n=6>
- Cruise, R. J., Cash, R. W., & Bolton, D. L. (1985). Development and validation of an instrument to measure statistics anxiety. *The American Statistical Association*. 55, 868–875.
- Hanna, D., Shevlin, M., & Dempster, M. (2008). The structure of the statistics anxiety rating scale: A confirmatory factor analysis using UK psychology students. *Personality and Individual Differences*, 45(1), 68–74.
- Haque, H. S., & Abd Hamid, H. S. (2014, August 21–22). Detrimental external factors that influence performance of students who repeat Psychological Statistics. In *Proceedings of the 11th International postgraduate research colloquium* (pp. 157–171). Serdang, Malaysia (CD).
- Hsiao, T. Y. (2010). The Statistical Anxiety Rating Scale: Further evidence for multidimensionality. *Psychological Reports*, 107(3), 977–982.
- Papousek, I., Ruggeri, K., Macher, D., Paechter, M., Heene, M., Weiss, E. M., ... & Freudenthaler, H. H. (2012). Psychometric evaluation and experimental validation of the Statistics Anxiety Rating Scale. *Journal of Personality Assessment*, 94(1), 82–91.

Chapter 14

Learning Arabic Language Among Diploma Students in UiTM: A Look at Students' Perspective

Khaulah Riddzwan

Abstract Based on Malaysia Education Blueprint 2013–2015, students are expected to learn an additional language by the time they leave school. As such, the learning experiences provided at higher institutions need to be in line with the government's plan for bilingualism. This research seeks to find out the perception of Diploma students in learning Arabic Language. This study is based on Gardner's socio-educational model. Specifically, the focus of this research will be on their language learning attitude and two types of motivational orientation which are integrative and instrumental motivation. This study used a quantitative research design. A total of 105 Diploma students were selected using the purposive sampling technique. Data were collected through questionnaires and analyzed descriptively. Finding of this research reveals that the level of attitudes in integrative learning situations and the attitude towards the learning situations are at a high level, while the instrumental attitude is exceptionally high. Other than that, the implication that can be drawn from this study is that teachers and students need to take into account and emphasize on integrative orientation. In addition to that, learning language attitude conditions and instrumental orientation are needed to develop a positive attitude among students who aim to master the Arabic language.

Keywords Arabic language • Attitudes • Instrumental • Integrative • Learning

14.1 Introduction

Universiti Teknologi MARA (UiTM) is one of the higher institutions in Malaysia that offers various Arabic courses. In UiTM, the Arabic course as a third language is an elective course offered to Diploma students. This course is aimed to develop

K. Riddzwan (✉)

Academic of Language Studies, Universiti Teknologi MARA,
Jalan Purnama, Bandar Seri Alam 81750, Masai, Johor, Malaysia
e-mail: khaulah7337@johor.uitm.edu.my

students' ability to use the basic Arabic Language in social situations and also for communication purposes. This course is also expected to strengthen students' language skills in mastering four basic language skills at the beginning level. Since the students come from diverse backgrounds in Arabic learning experience, some of them show their confidence to speak in Arabic and some of them are just not interested. This happened due to the several factors such as age, anxiety, aptitude and amount of exposure responsible for the language learning. However, this is probably due to the attitudes of students towards Arabic language while the research has shown that attitudes also play part in learning a second language (Gardner and Lambert 1972; Baker 1992; Parilah 2002; Ghazali et al. 2010; Zulkifley et al. 2010; Natsue 2012; Zamri et al. 2014; Khaulah 2013). Therefore, the present investigation is conducted to study the influence of this factor on the target group learner.

Based on Gardner's theory, integrative motivation, instrumental motivation, and attitudes toward learning conditions are important in determining the success of language learning. A student is said to have an integrative orientation if he learns a second language to integrate himself better into a community acquainted with the language. In other words, integrative motivation refers to a positive attitude towards elements that are in the target language. Asmah (1982) suggests students who possess a higher integrative orientation believe that they should know the background or culture to make learning the second language attractive. Those with a higher instrumental orientation believe that learning a second language is important as the language may be used as a medium of instruction not only in learning, but also in life (Mohd Firdaus 2003). Baker (1992) has the opinion that if a student does not know the importance of learning a foreign language, most probably this student will have a negative attitude and will not be interested in learning the language.

According to Azizeh and Zohreh (2010), attitudes toward learning conditions concern that teachers, the curriculum, the syllabus, textbooks and school activities have an important role in ensuring that students master the second language and the process of teaching and learning remains effective. In Malaysian context, many researches have been done relating to the improvement of students teaching and learning, including the incorporation of learning styles into technology in Arabic and Islamic education. Overall, if a student possesses a positive attitude, learning Arabic language will be easier for them, and their language skills can be improved.

Furthermore, many studies have shown that the real goals and objectives of learning the Arabic language have not yet been achieved, which is a growing concern, particularly for teachers (Abdul 1993; Kamarulzaman et al. 2002; Ainon and Abdullah 2005; Idris 2000; Kaye 2000; Nambiar et al. 2008). According to (al-Tamimi and Munir 2009; Asmah 1992; Gardner 2001; Mobashshernia and Aghaahmady 2010; Jamaliah 2007; Jamali 1992) a variety of factors that affect the learning of the Arabic language include the teachers themselves, their pedagogy, the educational system and educational technology, the learning environment, and other factors. The attitude is a contributing factor that influences language learning. Thus, in order to master a third language, a student must continuously work hard to practice and apply the skills that they have learned. They must also continue to possess a positive attitude in learning a language that is foreign to them.

14.2 Research Framework

This study uses a theoretical socio psychological theory presented by Gardner and Lambert (1972) and Gardner (2001). This theory has been known into a theoretical model as the socio-educational model. In socio-educational model, attitude is the most important element in determining the performance of learning a language. Gardner and Lambert (1972) found that language attitudes either positively or negatively influence the motivation or achievement of language. Dimitrios (2010) also agrees in his study by stating that the ability of the individual to master language is the result of a gradual adaptation of social behaviour and culture. Gardner (2001) introduced the socio-educational model that has been modified based on the improvement of the previous model.

Attitude theory introduced by Gardner and Lambert (1972) is correlated with the proficiency in a third language. Positive attitude towards the target language, the speaker of the target language and the target language culture are among the key elements in improving and enhancing the quality of learning, while a negative attitude may hinder the process of learning the language. Gardner's socio-educational theory involves integrative orientation, instrumental orientation and the attitude of learning situations towards speakers of the target language or the others in general.

Psychologically, students are influenced to the culture of the target language. According to Fasold (1984), a positive attitude towards language integrative attitude reflects high observation, evaluation of the languages and cultures represented. The teaching of culture should become an integral part of foreign language instruction. Alongside linguistic knowledge, students should also familiarise themselves with various forms of non-verbal communication typical in the target culture. Culture teaching should allow learners to increase their knowledge of the target culture in terms of people's way of life, values, attitudes, and beliefs (Dimitrios 2010). This means that the more familiar culture of a language, the easier it is for individuals to master the language. On the other hand, instrumental attitude is characterised based on certain values and motivation to learn due to getting a better job, studying at a higher level and helping third language learning process. However, the attitude of learning situations involves the characteristics of the resulting behaviour in the context of formal learning in the classroom. It relates to the trainers, classmates, learning materials, curriculum, activities in the classroom or outside the classroom and others.

14.3 Objectives of the Study

1. To determine the level of integrative orientation in learning Arabic language among Diploma students.
2. To identify Diploma students' attitudes towards their learning conditions.
3. To determine the level of instrumental orientation in learning Arabic language among Diploma students.

14.4 Methodology

This study used a questionnaire consisting of closed questions only to simplify the process of analyzing data using SPSS Statistical Package for the Social Sciences (SPSS). A Likert scale consisting of five levels of measurement is used to measure the students' perspective (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Disagree and 5=Strongly Agree).

To determine the language attitudes of the respondents, this study measures three types of attitudes in three categories which are the integrative attitude (Category 1), attitudes towards their learning conditions (Category 2) and instrumental orientation (Category 3). This study used a quantitative research design. A total of 105 Diploma students at the Faculty of Business Management, UITM Johor, Pasir Gudang Campus were selected using the purposive sampling technique. Data were collected through questionnaires and analysed descriptively. The questions or statements are detailed out in the analysis of findings section for ease of reference. Students responded to the statements in the survey by giving them a rating between 0 and 5 as an indication of the extent of agreement to the statement, with 0 being the lowest and 5 being the highest (Alias 1999). The answers to the questionnaires were rated as to their level according to Table 14.1.

14.5 Results and Discussion

In this study, all three objectives were achieved through the descriptive analysis of the data gathered from the study. Thus, the findings are divided into three parts as follow:

14.5.1 *The Level of Integrative Orientation*

The statements/questions intended to determine the students' level of integrative orientation are coded and tabulated in Table 14.2.

From the integrative orientation, the lowest mean score is item QA3 that respondents were not exposed to the Arabic-speaking friends and did not have much experience with them. If they have more opportunities to the Arabic-speaking environment, indirectly they will be able to practice and learn to communicate using Arabic language skills and they may understand the Arab culture better. Tamimi and Shuib (2009) found that most students like to hang out with English speakers in

Table 14.1 Questions in the survey answer and rating level of statements scores

Answer	0–1.5	1.5–2.5	2.5–3.5	3.5–4.2	4.2–5.0
Level rating	Very low	Low	Medium	High	Very high

Table 14.2 Items, mean scores and level to determine student's integrative orientation

No.	Item	Mean	Level
QA1	I want to know more about Arabic speakers	4.39	Very high
QA2	To me, Arabic speakers should be proud that they have mastered the Arabic language as it can benefit society	4.61	Very high
QA3	I have experience with Arabic-speaking friends	3.41	Medium
QA4	It is a waste not being able to speak with Arabic speakers after learning the language	4.07	High
QA5	It is very easy to start a conversation with Arabic speakers, and this has helped me to excel in Arabic Language	3.72	High
QA6	I hope to have many friends who speak Arabic	4.16	High
QA7	Arabic speakers are very friendly and nice	4.05	High
QA8	The more people I know who speak Arabic, the more I'm interested in the language	4.00	High
QA9	I can trust people who speak Arabic	3.87	High
QA10	Learning Arabic language is important as it can help me to interact more easily with people who speak Arabic	4.43	Very high
QA11	Learning Arabic language is important for me to better understand and appreciate the Arab way of life	4.07	High
QA12	Using Arabic more often will not cause the loss of my identity	4.34	Very high
QA13	Mastering the Arabic language can strengthen my relationship with other communities	4.01	High
QA14	Speaking in Arabic will never lead me to lose my national identity	4.54	Very high
QA15	I'm not ashamed to speak in Arabic with other people of my race	4.16	High

order to benefit in enhancing the ability of a second language. Thus, the higher second language and its culture are admired, the higher the probability of the language learning process to be effective and successful. Kramsch (1993) also believes that culture should be taught as an interpersonal process and rather than presenting cultural facts, teachers need to help students to be aware of the 'other cultures'. The respondents also agreed that the use of the Arabic language will not cause them to lose their personal or national identities. Findings related to integrative orientation were in line with the socio-educational model of Gardner (2005) which states that attitudes toward the second language is closely related to social factors and culture. The students in this study had overall positive attitude towards Arabic and integrative orientation. They believe that learning Arabic will help them understand the way of life of the Arabs countries and societies better (Kreamer 1993; Saadiah 1995).

14.5.2 *The Level of Attitude Towards Learning Situations*

To determine the level of attitude towards learning conditions, items in the following Table 14.3 were used in the survey.

Table 14.3 shows the mean score of items in the survey with regards to the students' attitudes towards learning conditions. As seen in Table 14.3, the result is entirely different from the integrative orientation of the students. Generally, their attitudes are positively high with most of the items except for four items (QB5) (QB7) (QB12) (QB21), which they scored medium. The highest mean score is item QA3 which implied that the respondents loved the way the Arabic lecturer teaches. Therefore, teacher's role is not only limited to teach what is in the textbook. Teachers also need to diversify the teaching strategies so that students will feel more motivated and interested to learn Arabic language. It will also lead to more interesting and fun classroom environment. Teachers should consider a two-way approach with regard to teaching and interactive language learning (Zamri et al. 2014). The research also shows that the respondents are not prepared before they come to learn Arabic language, based on items (QB5) and (QB12). Willingness to learn is a very important factor to ensure that each content lesson is understood by the students. According to

Table 14.3 Items, mean scores and level to determine student's attitude towards learning situations

No.	Item	<i>M</i>	Level
QB1	All students should be involved in the Arabic Language programs	4.19	Very high
QB2	Learning Arabic language is fun	4.55	Very high
QB3	Discussing Arabic language makes me happy	4.27	Very high
QB4	Learning Arabic language is never boring	4.26	Very high
QB5	I immediately do my Arabic language homework	3.33	Medium
QB6	I love to complete Arabic language exercises given by the lecturer	3.66	High
QB7	I do my Arabic language homework according to a schedule	3.08	Medium
QB8	I am active in the Arabic language class	3.77	High
QB9	I strive not to fail in the Arabic language class	4.34	Very high
QB10	I prefer Arabic Language than other subjects	3.65	High
QB11	I focus on Arabic language questions that are expected to come out in the exam	3.65	High
QB12	I never delay doing Arabic Language assignments	3.29	Medium
QB13	Activities in the Arabic Language enhancement program should be held at least once a semester	4.18	High
QB14	I'm going to take the Arabic language course although it is not compulsory	3.76	High
QB15	The number of hours in Arabic language classes should be extended	3.65	High
QB16	I like all the lecturers who teach Arabic language	4.55	Very high
QB17	I can easily understand the subjects taught by all the Arabic language lecturers	4.35	Very high
QB18	The textbooks for Arabic language are very interesting	4.11	Very high
QB19	I can easily understand Arabic when reading Arabic Language textbooks	3.92	High
QB20	I like reading Arabic textbooks	3.73	High
QB21	I can learn Arabic using textbooks without the help of a teacher	2.70	Medium
QB22	I love the way my Arabic lecturer teaches	4.88	Very high

Bruner (1966), willingness to learn refers to anything that can be communicated effectively to the person at any stage of development. This is because willingness to learn can be created through the development of an individual's emotional, intellectual, psychomotor and maturity of the students. When it comes to students' attitudes towards the learning situation, the study shows that the students still relied fully on lessons given by the lecturers in class. This is likely due to the fact that outside of classes, the students are not motivated enough to work hard and learn the Arabic language individually. This coincides with Lin and Yin's opinion (1997) that some Asian students are usually quiet and passive. They still adhere to their stereotypical attitudes and do not want to take part in the process of language learning.

14.5.3 The Level of Instrumental Orientation

Table 14.4 shows the items for instrumental orientation of Diploma students studying Arabic language.

Table 14.4 Items, mean scores and level to determine student's instrumental orientation

No.	Item	<i>m</i>	Level
QC1	Arabic language skills are essential for furthering studies at a higher level	4.35	Very high
QC2	Having the skill to speak in Arabic is a characteristic of an educated person	4.26	Very high
QC3	I can expand my knowledge through reading Arabic newspapers if I master Arabic language	4.16	High
QC4	Arabic is becoming increasingly important as an international language	4.14	High
QC5	Job opportunities will increase for me if I master Arabic language	3.89	High
QC6	It is important for me to have Arabic language to communicate with Arabic communities if I further my studies in an Arab country	4.68	Very high
QC7	Having Arabic language is essential for my future education	4.32	Very high
QC8	Having Arabic language is necessary to broaden our interactions with people from other countries	4.12	Very high
QC9	Having Arabic language is important when I go on vacations in Arabic-speaking countries	4.48	Very high
QC10	Arabic language is useful for Muslims who want to understand religious rulings	4.60	Very high
QC11	Mastering Arabic language enables me to understand Arabic documentaries	4.30	Very high
QC12	I have a better understanding of the Qur'an by learning Arabic language	4.43	Very high
QC13	It is a necessary to learn Arabic language skills to facilitate learning about Islam	4.64	Very high

This suggests that instrumental motivation remains the largest factor that drives the students to take up learning Arabic language. Apart from item QC6, religious sentiments (QC10 and QC13) scored the highest mean values. Quran is written in Arabic language. Knowing Arabic language facilitates the understanding of messages in Quran. However, the factors were found more than a factor instrumental employment prospects (QC5). Instrumental attitude shown could encourage motivation to learn the language. In relation to instrumental orientation, the study found that Arabic is becoming increasingly important as the language of communication. This shows that students are aware that Arabic is an important language in the international arena and they feel that it is important to learn Arabic so that they can communicate with the Arabs if they study in an Arabian country. Thus, students' experiences do help students in learning Arabic. Experience is important and can be used if they study in an Arabian country and mingle with the Arabian community.

14.5.4 *The Overall Level of Attitudes*

Table 14.5 shows the level and the mean scores received in the three domains in the questionnaire. The three domains are integrative orientation, attitudes toward the learning situation, and instrumental orientation. Based on the analysis, instrumental orientation obtained the highest mean score of 4.33 (Very high), while integrative orientation received a mean score of 4.12 (High). The mean score for attitudes towards the learning situation was also high (3.90). It is clear from the findings that students have similar integrative and instrumental orientation. However, they are more consistent with regards to their instrumental orientation. Even though their motivation is high, their attitudes towards learning are not as positive as their motivational orientation. This seems to suggest that an improvement in the learning environment, situations and conditions is certainly a must to further improve their attitudes. These improvements have been identified in the previous section.

14.6 Conclusion

In summary, the study found that the level of attitudes in integrative learning situations and the attitude towards the learning situations are at a high level, while the instrumental attitude is exceptionally high. This shows that Diploma students have

Table 14.5 Overall level and scores of attitude and orientation

Item	Mean	Level
Instrumental orientation	4.33	Very high
Integrative orientation	4.12	Very high
Attitudes towards learning situations	3.90	High

a positive attitude towards learning Arabic language courses at FPP, UiTM Pasir Gudang Campus. The students have a positive attitude towards the Arabic language and integrative orientation. They also have a very high level of instrumental orientation, realizing the significance of the Arabic language in international arena and in improving themselves in religious matters. Several improvements have been identified from this study. Overall, this study can be a guide to all parties concerned with the teaching of foreign languages, especially Arabic language teachers and scholars to assist students in Malaysia to learn Arabic more effectively. Positive attitude of the respondents should be maintained and developed in the process of teaching and learning the Arabic language. The study also indirectly provides insight into the attitude of Malaysians towards learning foreign languages. This study is compatible with Malaysia Education Blueprint 2013–2015, as students are expected to learn an additional language by the time they leave school in the twenty-first century. As such, the learning experience provided at higher institution needs to be in line with the government's plan for bilingualism.

References

- Abdul, R. I. (1993). *Teaching of Arabic as a second language*. PhD thesis, University of Salford.
- Ainon, M., & Abdullah, H. (2005). Guru sebagai Pendorong Dalam Darjah [*Teachers as motivators in classroom*]. Bentong: PTS Profesional Publishing Sdn. Bhd.
- Alias, B. (1999). *Statistik penyelidikan dalam pendidikan dan sains sosial*. Bangi: Penerbit Universiti Kebangsaan Malaysia.
- al-Tamimi, A., & Shuib, M. (2009). Motivation and attitudes towards learning English: A study of Petroleum Engineering Undergraduates at Hadhramout University of Sciences and Technology. *Gema Online Journal of Language Studies*, 9(2), 29–49. http://www.ukm.my/ppbl/Gema/abstract%20for%20pp%2029_55.pdf
- Asmah, O. (1982). *Language and society in Malaysia*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Asmah, O. (1992). *Linguistic scenery in Malaysia*. Kuala Lumpur: Dewan Bahasa dan Pustaka.
- Azizeh, C., & Zohreh, K. (2010). Motivation and attitudes of Iranian undergraduate EFL students towards learning English. *Gema Online Journal of Language Studies*, 10(2), 37–56. http://journalarticle.ukm.my/2328/1/page1_21.pdf
- Baker, C. (1992). *Attitudes and language*. Philadelphia/Adelaide: Multilingual Matters Ltd.
- Bruner, J. S. (1966). *Toward a theory of instruction*. Cambridge, MA: Harvard University Press.
- Dimitrios, T. (2010). The importance of teaching culture in the foreign language classroom. *Radical Pedagogy*. http://radicalpedagogy.icaap.org/content/issue3_3/7-thanasoulas.html
- Fasold, R. (1984). *The sociolinguistics of society*. Oxford: Blackwell.
- Gardner, R. C. (2001). Language learning motivation: The student, the teacher, and the researcher. *Texas Papers in Foreign Language Education*, 6(1), 1–18.
- Gardner, R. C. (2005, May 30). *Integrative motivation and second language acquisition*. Joint Plenary Talk presented at the meetings of the Canadian Association of Applied Linguistics and the Canadian Linguistics Association. The University of Western Ontario, London, Canada. <http://publish.uwo.ca/~gardner/docs/caaltalk5final.pdf>
- Gardner, R. C., & Lambert, W. E. (1972). *Attitudes and motivation in second-language learning*. Rowley: Newbury House.
- Ghazali, Y., Nik M. R., & Parilah M. S. (2010). Sikap pelajar terhadap pembelajaran kemahiran lisan bahasa Arab di Universiti Teknologi MARA (UiTM) [Student attitudes towards Arabic language oral skill at the MARA University of Technology]. *GEMA Online Journal of*

- Language Studies*, 10(3), 15–33. [http://www.ukm.my/ppbl/Gema/GEMA%20vol%2010%20\(3\)%202010/abstract%20pp%2015_33.pdf](http://www.ukm.my/ppbl/Gema/GEMA%20vol%2010%20(3)%202010/abstract%20pp%2015_33.pdf)
- Idris, A. (2000, October 31–November 1). Permasalahan pengajaran dan pembelajaran bahasa Arab di kalangan penuntut PJJ UKM: Satu tinjauan [*Problems in teaching and learning of Arabic language among UKM's Distance Learning students: A survey*]. Paper presented at the National Seminar on Distance Learning, Distance Learning Centre, Universiti Kebangsaan Malaysia, Bangi, Selangor.
- Jamali, I. (1992). Sikap, motivasi dan pencapaian dalam pembelajaran bahasa Inggeris sebagai bahasa kedua di kalangan pelajar Melayu [Attitudes, motivation and performance in the learning of English as a second language among Malay students]. *Jurnal Dewan Bahasa*, 36(11), 1071–1085. <http://elib.uum.edu.my/kip/Record/um609866>
- Jamaliah, R. (2007). Sikap dan motivasi pembelajaran bahasa Arab: Hubungannya dengan pencapaian: Satu kajian [*Attitudes and motivation in the learning of Arabic language: Their relation to performance: A survey*]. MA thesis, Faculty of Education, Universiti Kebangsaan Malaysia.
- Kamarulzaman, A. G., Zawawi, I., Nik, M. R., Nik, Y., & Mohd A. N, Abdul, L. (2002). Pembelajaran bahasa Arab di kalangan orang dewasa: Satu tinjauan di UIAM [Arabic language learning among adults: A survey at UIAM]. In Mohamed Amin Embi (Ed.), *Education for all: Towards quality, equality, accessibility & excellence in literacy*. Bangi: Faculty of Education, Universiti Kebangsaan Malaysia.
- Kaye, A. S. (2000). The Arabic language. *Journal of the American Oriental Society*, 120(1), 120–122.
- Khaulah Riddzwan. (2013). Sikap pelajar PJJ Fakulti Pengajian Islam, UKM terhadap kursus kemahiran Bahasa Arab [*Attitudes of Distance Learning Students at UKM's Faculty of Islamic Studies Towards Learning Arabic Language Skill Courses*]. MA thesis, Faculty of Islamic Studies, Universiti Kebangsaan Malaysia.
- Kramsch, C. (1993). *Context and culture in language teaching*. Oxford: Oxford University Press.
- Kreamer, R. (1993). Social psychological factors related to the study of Arabic among Israeli high school students: A test of Gardner's socio-educational model. *Studies in Second Language Acquisition*, 15(1), 83–105. <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=2554484>
- Lin, J. G., & Yin, J. K. (1997). Asian international students' adjustment: Issues and program suggestions. *College Student Journal*, 31(4), 473–480. <http://psycnet.apa.org/psycinfo/1998-00065-007>
- Mobashshernia, R., & Aghaahmady, G. (2010). The utopian/dystopian view of ELT at undergraduate level: An attitudinal analysis. *International Journal of Language Studies (IJLS)*, 4(3), 1–26. <http://www.ijls.net/volumes/volume4issue3/mobashshernia1.pdf>
- Mohd. F. A. S. (2003). Sikap dan motivasi pembelajaran bahasa Inggeris serta implikasinya terhadap pencapaian: Satu analisis di kalangan pelajar sekolah menengah pendalaman Sabah [*Attitudes and motivation in the learning of English and their implications on performance: An analysis among secondary school students in rural Sabah*]. Master thesis, Faculty of Education, Universiti Kebangsaan Malaysia.
- Nambiar, R., Ibrahim, Noraini., & Krish, P. (2008). Penggunaan strategi pembelajaran bahasa dalam kalangan pelajar tingkatan dua [The use of strategies in language learning among form 2 students]. *Jurnal e-Bangi*, 3(3), 34–44. <http://pkukmweb.ukm.my/e-bangi/papers/2008/radha.pdf>
- Natsue, H. (2012). *Sikap mahasiswa Universiti Kebangsaan Malaysia terhadap bahasa Jepun* [Attitudes of UKM's undergraduates towards the Japanese language]. MA thesis, Faculty of Language and Linguistics, Universiti Kebangsaan Malaysia.
- Parilah, M. S. (2002). Investigating L2 learning difficulties: A need for quality language education. In Mohamed Amin Embi (Ed.), *Education for all: Towards quality, equality, accessibility & excellence in literacy* (pp. 41–54). Bangi: Faculty of Education, Universiti Kebangsaan Malaysia.

- Saadiah, M. (1995). *Language attitudes among Malaysian students in the UK with respect to Malay and English*. Master thesis, University of York.
- Zamri, A., Jamsari, E. A., Khaulah, R., Muhammad, R. A., & Zulazhan, A. H. (2014). Attitudes of distance learning students at UKM's Faculty of Islamic Studies towards learning Arabic language skill courses. *Turkish Online Journal of Distance Education*, 15(1), 174–188.
- Zulkifley, H., Rahim, A. & Karim H. (2010). Sikap terhadap bahasa Melayu: Satu kajian kes di Pantai Timur Semenanjung [Attitudes towards the Malay language: A case study in the Eastern Coast of Malaysian Peninsula]. *Jurnal Melayu* 5, 163–176. http://journalarticle.ukm.my/3024/1/01ADNAN_JUSOH.pdf

Chapter 15

Exploring Supervisors' Perspectives to Enhance Postgraduate Supervision

Gurnam Kaur Sidhu, Sarjit Kaur, Chan Yuen Fook, Lim Peck Choo, Lee Lai Fong, and Leele Jamian

Abstract The advent of the Information Age leading to the democratisation and massification of higher education has led to institutions of higher learning (IHL hereafter) offering more flexible and diverse learning modes that allow adult learners to pursue their studies and upgrade their skills. Researchers note that while IHLs have witnessed a steady increase in the number of postgraduate enrolments, close to 40–50 % of these postgraduates students often leave without completing their doctoral studies. The high attrition rate coupled with the low-completion rate of research students has put a critical demand on IHL to critically examine supervision practices. Therefore, this paper puts forward the findings of an exploratory pilot study which investigated the perceptions of 32 postgraduate supervisors from two local universities in Malaysia. It explored supervisors' perspectives from a variety of aspects ranging from their roles and responsibilities to supervisory practices and level of support they provide to postgraduate students at various stages of writing a thesis. Data were collected using a questionnaire and semi structured interviews. Initial findings revealed that a majority of the supervisors felt that the main role of a supervisor is to help, coach and keep the students on track so that they can meet the required standards and quality in producing their thesis for examination at the end of their candidature. The supervisors also highlighted that a majority of postgraduate research students not only lacked reading, writing and research skills; but

G.K. Sidhu (✉) • C.Y. Fook • L.L. Fong • L. Jamian
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: gurnamsidhu@salam.uitm.edu.my; yuenfook@salam.uitm.edu.my;
leela679@salam.uitm.edu.my; leele@salam.uitm.edu.my

S. Kaur
English Language Studies Section, School of Humanities, Universiti Sains Malaysia,
11800 Gelugor, Penang, Malaysia
e-mail: sarjit@usm.my

L. Peck Choo
Academy of Language Studies, Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
e-mail: pclim@salam.uitm.edu.my

also the ability to take responsibility for and ownership of their work. The implications of the study suggest that postgraduate supervisors need to re-examine their roles in today's changing landscape of postgraduate supervision.

Keywords Supervisors • Postgraduate • Supervision • Roles • Responsibilities • Higher education

15.1 Introduction

In today's changing scenario of higher education, many universities are becoming global enterprises competing across borders for students, research funding and prestige (Kandiko and Blackmore 2012). This move coupled with the advent of the Information Age brought about a massification and democratisation of education at all levels including postgraduate education (OECD 2008, p. 41). Today institutions of higher learning (referred to as IHL, hereafter) have begun to offer a variety of flexible and diverse learning modes that allow and encourage adult students to make a comeback to schools in order to pursue their studies and upgrade their skills.

Researchers (Cassuto 2013; Smallwood 2004) note that while postgraduate numbers have increased over the years in IHLs all around the globe, approximately 50 % of postgraduate research students often leave without completing their doctoral study. The high attrition rate of postgraduate research-based students has become a grave concern among academics as attrition often bears the connotations of failure, loss, despair, drop-outs and a waste of human resource and government's financial resources. Latona and Browne (2001) summarised institutional/environmental (e.g. protocols and procedures, infrastructure support, research culture, scholarly community) supervisory practices (e.g. type and frequency of feedback, supervisory meetings, student-supervisor relationship) and students' characteristics (entry requirements, financial, personality traits) as the three main factors contributing to high attrition rate. Likewise a similar stance was taken by Ssegawa and Rwelamila (2009) who classified the issue into three major themes which are student deficiencies, inappropriate supervision processes and inappropriate research environment. Other researchers (Cassuto 2013; Chapman 2009; Sidhu et al. 2013, 2014; Smallwood 2004) have also outlined similar factors at play including poor and low quality higher education facilities and poor quality postgraduate supervisory practices. Furthermore findings obtained by studies conducted by Harman (2003) in Australian research-intensive universities and Haksever and Manisali (2000) in the UK also revealed problems with supervision as one of the main reasons for non-completion of study among PhD candidates.

Previous research has identified the issue of research supervision as being a critical factor in PhD completions (Baird 1995; Barnes and Austin 2008; HEFCE 2011; Wichmann-Hansen et al. 2012). These empirical findings have sparked interest in postgraduate supervision which has long been a neglected field in higher education.

Supervision is often viewed as a complex and subtle process that is both crucial and essential to the success of a graduate student as the supervisor is one of the most important individual with whom the student will interact with during the postgraduate programme. According to Kumar and Bujang (2011) a supervisor is one who is entrusted by the institution to guide, advise and assist a student from the beginning till the end when a student receives his/her doctorate. The assistance and mentoring provided by a supervisor throughout the supervision process can reduce the risk of failure to postgraduate students.

Van de Noort (2010) adds that supervisors should help students adapt to the nature of research and provide them guidance in terms of planning the research framework, locating relevant literature sources, and providing a good knowledge base of research methods, instrumental techniques and research data management. Abdulfattah Yaghi (2008) stresses that later during the period of writing-up of the thesis supervisors are expected to keep in contact with students and provide constructive feedback and comments on students' written drafts. Ahern and Manathunga (2003) further argued that supervisors should be "clutch starters" for their stalled supervisees. They must be able to recognize when and why (cognitive, emotional, social, or just part of the research process) their students stalled and be able to provide the necessary support and encouragement for them to move on.

Barnes and Austin (2008) point out that doctoral supervisors play a critical role in the academic life of their students because the supervisor is the 'principal interface between the student and the department' whilst 'the department is the primary socialization agent at the doctoral level' (p. 298). They should also be a source of reliable information, departmental socializer, advocate, role model, and occupational socializer. Furthermore they add that supervisors also contribute to the quality of students' doctoral experiences, and their post-graduate options by providing opportunities to attend and present at conferences, participate in research projects, and publish; they also help students become part of the disciplinary community and bolster students' confidence. Gurr (2001) suggests that the role of supervising would typically involve feedback, time, money, networks, and recognition to the student by an established authority in academia.

Lawson et al. (2009) looking at students' perspectives, emphasize that supervisors should also be aware of relevant regulations and legal issues pertaining to students' study. Furthermore supervisors' should not only limit assistance to plagiarism but should also look into aspects such as data protection, health and safety and any ethical issues that might arise in research nature. Supervisors should also help develop a 'learning diagnosis' of each of their supervisee so that they can assess with their supervisee how they learn best (Delano and Shah 2006).

Another dominant theme in literature relevant to supervision is the practical aspect of doctoral advising and the behavioral characteristics a supervisor should possess to create a positive influence on their supervisees. Students indicate that they would like a supervisor who is people-centred, caring, warm, accessible, patient and supportive (Sidhu et al. 2013). To this Johnson and Huwe (2003) suggested that advisors should be honest, accessible, caring, and supportive. Although such information regarding the roles, responsibilities, and behavioral characteris-

tics of a successful doctoral advisor is intended to be helpful, it is seldom empirically based.

Nevertheless there is also no denying that there exist some problematic aspects with regards to advising and mentoring postgraduate students. For instance, some supervisors are not able to form collaborative, productive and satisfying relationships with their supervisees. On the other hand there are cases where supervisors fail to provide effective guidance that can help address supervisees' developmental problems in completing their theses. This aspect was also highlighted by Alexander and Davis (2014) who questioned the credibility and effectiveness of PhD supervisors in their article entitled "Do supervisors make the grade?" Brabazon (2009) further debated whether PhD standards are improving or deteriorating as there is a global race by IHLs to increase student intake. This has resulted in the increase in the number of PhD scholars with quality taking a backseat. In such a scenario, poor theses could be a result of inexpert or ineffective supervision.

Aranda-Mena and Gameson (2012) point out that effective supervision is a critical factor in PhD completions and they highlight that the Australian report on PhD supervision, conducted at the Australian National University [ANU] by Cullen et al., outlined the following three main issues that require attention:

- Supervision should be conceptualised to encompass a broad view of PhD education which includes more than one-to-one interaction of a student and a supervisor;
- Programs for staff and students to improve practice can and should be designed to contextualise the generic process of supervision with attention to disciplinary and usual human variation, and,
- There is a need to go beyond individual supervisory interactions and restructure practice to ensure that responsibility for quality is shared and coordinated. (Cullen et al. 1994, p. 108–109).

As important as that perspective, there is sparse empirical work on postgraduate supervision especially from the supervisors' perspectives in Asian countries like Malaysia. In a move to help Malaysia become a keen competitive global player in today's changing landscape of higher education, the government launched MyBrain15 under the Higher Education Strategic Plan in 2007. Under this initiative the MOE hopes to produce 21,000 PhD holders by 2023 resulting in an increase in postgraduate enrolments in almost all IHL in Malaysia. As a result, interest in postgraduate supervision is rapidly growing and therefore this paper aims to explore the supervisors' perspectives on postgraduate supervision in a bid to enhance postgraduate supervision in IHL especially in Malaysia.

15.2 The Study

The main aim of this exploratory pilot study was to investigate the perspectives of Malaysian supervisors' on postgraduate research supervision. Their perspectives were explored from the following dimensions: roles and responsibilities of

supervisors, effective supervisory practices, supervisors' personal and leadership/mentoring characteristics and supervisors' support at different stages of supervision. This study employed a descriptive research design with a mixed methods approach. The study involved two public universities referred to as University A (UA, hereafter) which is research university whilst University B (UB – hereafter) is a comprehensive university. The acronyms UA and UB were used as both the universities wished to remain anonymous. A total of 32 supervisors from UA and UB volunteered to participate in the study. Semi-structured interviews were conducted with 4 supervisors (2 from each university – referred to as UA1, UA2, UB1 and UB2 in this study).

Data were collected using a questionnaire and semi-structured interviews. The PG Questionnaire comprised seven sections and a total of 90 items with 5 open-ended questions. The PG Questionnaires were pilot tested at another public university in Malaysia and the overall alpha coefficient was .823. Both descriptive and inferential statistical analysis procedures were used to analyse the data. The semi-structured interviews were analysed both deductively and inductively to address the concerns of this study.

15.3 Findings

The following section presents the main findings obtained from the study. It discusses the demographic profile of respondents, the roles and responsibilities of supervisors, supervisory practices, and challenges to enhance postgraduate supervision.

15.3.1 Demographic Profile of Respondents

Investigation into the demographic variables indicated that out of the 32 supervisors a total of 25 (78 %) were female while the remaining 7 (22 %) were male. Close to 28 % (9) have been supervising PhD scholars for more than 10 years whilst the majority – i.e. 20 lecturers (62.5 %) have been supervising PhD students for less than 5 years. Only 8 (25 %) supervisors had gone for training on postgraduate supervision (duration of 2–3 days) whilst the rest had just attended a day or a lecture on postgraduate supervision. All the supervisors admitted that they were not accredited supervisors.

15.3.2 Roles and Responsibilities of Supervisors

A majority of the respondents claimed that they were clear about their roles and responsibilities as supervisors in postgraduate supervision ($M=4.37$, $SD=.669$). Findings also revealed that supervisors in both UA ($m=4.23$) and UB ($M=4.37$)

provided most support and guidance at the proposal stage, followed by final writing stage ($M=4.56$, $SD=.459$). The least support and assistance was provided at the data collection stage in UA ($M=2.32$, $SD=.762$) at the data collection ($M=2.43$, $SD=.878$) and data analysis ($M=2.53$, $SD=.876$) stage in UB.

Findings from the PG Questionnaire indicated that the supervisors agreed that their main role was to mentor and advise students at all stages of their study. At the proposal stage they would help candidates select a potential topic ($M=3.93$, $SD=.238$), identify experts in the area ($M=4.03$, $SD=.809$), help develop a theoretical framework ($M=4.30$, $SD=.702$) and conceptualize the study ($M=4.37$, $SD=.556$). At the data collection and data analysis stage respondents indicated that they should provide most help in assisting students to draw conclusions and inferences from data analyzed ($M=4.35$, $SD=.586$). Respondents from both universities also felt it was not their responsibility to assist candidates in planning the data collection schedule and helping out in the data analysis. Both groups, however, agreed that they should monitor the process of both data collection and analysis process. At the writing stage respondents strongly agreed that they should be academic role models to their students ($M=4.53$, $SD=.629$) and ensure students adhere to ethical research practices ($M=4.63$, $SD=.615$). Respondents also agreed that they should help prepare their candidates for the viva voce ($M=4.73$, $SD=.465$) and encourage students to present papers at academic conference ($M=4.47$, $SD=.623$).

The above findings were also articulated by all the four respondents during the semi-structured interviews. All four highlighted that their main responsibility was to provide students assistance and guidance so that they will successfully complete their study within the stipulated duration, i.e. 3 years for full time students and 5 years for part-time students.

Respondent UB1, a professor with 10 years of supervisory experience added that for a student to be successful, a supervisor first needs to build a positive relationship with not only the student but also maintain a good working relationship with the co-supervisor(s) or committee members as this relationship is a critical factor that can contribute to the success of the student. He also emphasized that a supervisor's role is also to monitor and provide help and guidance at "every stage of the study" and this includes "providing timely and constructive feedback". He highlighted that he felt it is also the duty of the supervisor to contact 'missing' and 'lost' students because they might be 'stuck' and in need of help to cope with failure at certain stages of their study.

Elaborating on that point both respondents UB1 and UB2 added that for a candidate to be successful, a supervisor sometimes needs to 'discipline' and 'reprimand' students'. The need to correct 'disrespectful' behavior or chastise students who do not 'toe the line' was highlighted by Respondent UB2 when she said that:

... some students make appointments to see me but would either not turn up or cancel at the last minute. Yet there were others who would 'disappear' for months and come back with nothing done. I feel that such behavior should be corrected right from the start ...

Respondent UB2 also felt that roles and responsibilities have changed over time because of the democratization of education. Having a mixed group of supervisees both young and experienced students, she felt that her current local PhD students were

rather “weak in their reading, writing and research skills.” This had put pressure on her as a supervisor and she now had to “go beyond her scope of duty to help and provide support to students so that they can develop their research and linguistic skills.”

Respondent UA1, a supervisor for the past 12 years further added that for a student to be successful, the supervisor must be good research model. To her it was also the role of the supervisor to “help postgraduate students to develop as future researchers and professionals so that they can continue to contribute to their respective field of knowledge and interest”. To this, respondent UB2 added that it was the role of the supervisor to help students to grow professionally and work collaboratively within their learning communities.

Finally one point stressed by all four supervisors during the interview was the issue of ethics in research. The respondents felt that it was the duty of the supervisor to ensure students adhere to ethics of research. Respondent UB2 felt that she had come across students who manipulated data in their study and felt “a little manipulation is all right.” The issue of integrity was also voiced by Respondent UA1 who felt that some students can ‘hoodwink’ their supervisors if they are not careful. She felt that effective supervisors should ensure students are held accountable for their research studies and they must ensure ethics of research are held at all times.

15.3.3 Supervisory Practices

Besides exploring supervisors' roles and responsibilities, respondents were also asked to give their feedback on some best supervisory practices for effective supervision. A large majority of the supervisors agreed that as supervisors they should be good research role models ($M=3.67$, $SD=.421$) and be able to demonstrate their knowledge and understanding of research methodology ($M=3.98$, $SD=.534$). An effective supervisor should also provide prompt, quality and constructive feedback ($M=3.23$, $SD=.612$) and possess good communication skills ($M=3.76$, $SD=.221$). The respondents also expressed strong agreement that supervisors should read and edit students' given drafts before consultations ($M=4.53$, $SD=.629$) and ensure students produce high quality work ($M=4.57$, $SD=.504$). Furthermore, they should engage with academic research communities, know how and where to publish and present at academic conferences.

Supervisors expressed moderate agreement to aspects such as providing motivation and confidence ($M=2.32$, $SD=.235$) to students and helping them solve their personal and emotional problems ($M=2.76$, $SD=.523$). A majority of the supervisors also indicated moderate agreement to having read their respective institution's Supervisory Guidelines/Code of Practices for Supervision ($M=3.73$, $SD=.868$).

The analysis of the interview sessions revealed that the supervisors considered the following as some effective supervisory practices:

- Supervision is like good parenting. They should help, encourage, coach and mentor their students.
- Supervisors must be patient and generous with their time.

- Supervisors should respect students as learning individuals so that they do not fear supervisors.
- Supervisors should be professional at all time and maintain integrity. Do not cross the boundary.
- Supervisors should never return a student’s draft without any annotations or critical constructive feedback.
- The supervisory process should be a friendly, cordial, supportive and motivating one.
- Students should be provided with reasonable time lines to ensure completion of research project according to mutually agreed time frame
- Students should be given space to make mistakes and grow as researchers
- Students must be reassured that writing is a process so change is inevitable. Writing many drafts and reflecting over the writing is ‘*part and parcel*’ of doing a PhD.
- Students should be monitored for progress at all stages of their study and put them on track if and when they default
- Students and supervisors should work collaboratively to publish and present work at academic conferences.
- Students should be encouraged to become confident, independent learners and researchers.

15.3.4 Addressing Challenges to Enhance Postgraduate Supervision

Another aspect explored in this study was to address the challenges faced by supervisors so that postgraduate supervision could be further enhanced. The following are some of the main issues and concerns expressed by the supervisors in this study.

15.3.4.1 Clarification of Roles and Responsibilities of Supervisors

Supervisors in this study felt that postgraduate supervision encompasses a rather broad view of roles and responsibilities in today’s changing landscape of higher education. Therefore, both students and supervisors must be well-equipped with a comprehensive handbook which outlines the roles and responsibilities of both supervisees and supervisors. Furthermore, they felt that supervisors too should be given these guidelines so that more effective supervisory practices can be implemented. Respondent UA2 reiterated that some supervisees can be rather ‘demanding’ at times as they often expect ‘instant feedback’. Furthermore some students expect their supervisors to be well-versed in student admissions and often fault a semester due to failure to abide by registration processes and procedures. If the guidelines and the scope of roles and responsibilities are well documented there would be little or no ground for contention between the two groups.

15.3.4.2 Restructure Supervision Practice

Respondents UA2 and UB2 stressed that most universities today offer a variety of PhDs such as PhD by coursework, PhD by mixed-mode, PhD by full research, an Industrial PhD, Portfolio PhD, and so on. All these PhDs are offered in flexible learning environments and supervision is no longer the traditional face-to-face interaction between a student and supervision. Therefore, there is a need to restructure supervision practice. Today most students have a minimum of two supervisors; a main and a co-supervisor where each has a particular strength or expertise to contribute to the student's research study. Another reason is that there is always the fear that one of the supervisors might retire or leave the institution. Some institutions have a panel of supervisors whilst others might opt for e-supervision using on-line technologies such as twitter, skype, Facebook and WhatsApp. Respondents from both UA and UB emphasized that as busy supervisors they viewed on-line supervision as an attractive alternative. This was also viewed as a better alternative for students who lived far away from campuses or were coming from another state. This way supervisors would not 'feel guilty' having to make 'last-minute cancellation' to scheduled supervision meetings (Respondent UB1). Hence institutions must be ready to restructure supervision practice to the changing times and provide the necessary support in terms of knowledge, skills, facilities and technologies to cater for the changing structure of supervision practice today.

15.3.4.3 Professional Enhancement Programmes for Supervisors and Supervisees

Findings in this study indicated that the supervisors felt that their students had moderate reading skills ($M=2.37$, $SD=.675$) and limited writing skills ($M=2.20$, $SD=.439$) as they displayed poor grammar and limited academic writing style. Respondent UB2 pointed out that a large majority of her students were not able to put across their thoughts and ideas cohesively in writing since English was either a second (ESL) or foreign (EFL) language for them. Furthermore, findings revealed that students were only moderately equipped with research ($M=2.77$, $SD=.874$) and conceptual ($M=2.65$, $SD=.737$) skills. Respondents highlighted that due to students' limited capabilities in research methodology and academic writing skills, more specific workshops on various aspects of research methodology ought to be conducted on a weekly or monthly basis. Respondents from both universities highlighted that Postgraduate Centres at their respective institutions do conduct such courses but have failed to create a positive impact. Respondent UB1 further emphasized that writing centres should be set up in postgraduate centres so that students could go for professional help and guidance.

A majority (93.3 %) of the supervisors in this study had not attended any formal supervision course and none of them were accredited supervisors. There was however, a mixed response as to whether supervisors should be accredited. Approximately 43.4 % felt supervisors could be accredited whilst the remaining 56.7 % felt

otherwise. Nevertheless a majority (89.6 %) suggested that experienced supervisors should mentor young and new supervisors and professional training should be provided to inexperienced supervisors. All the respondents also agreed that continuous professional development courses should be conducted for supervisors on a regular basis. Among the training courses they would like to attend included: publishing in high impact factor journals ($M=4.13$), evaluating theses as external/internal examiners ($M=4.12$), effective coaching and mentoring for doctoral supervision ($M=3.98$) fostering autonomy among students ($M=4.10$) and update on procedures and policies on postgraduate supervision ($M=3.87$).

15.3.4.4 Institutional Facilities

Respondents from both UA and UB expressed a strong agreement ($M=4.79$, $SD=.786$) that institutional facilities in their respective institutions left much to be desired. Respondent UB2 emphasized that that postgraduate facilities should provide the infrastructure for students to develop their learning communities. She further added that the goal of learning communities is for postgraduate students to work collaboratively, expand their knowledge base and disseminate their findings. Respondents in UA felt that more should be done to upgrade postgraduate facilities such as more well-equipped centres and IT facilities to improve their on-line servers and resources for postgraduate students. Respondents in UB highlighted that due to the lack of conducive postgraduate centres around campus, the establishment of learning communities among postgraduate research students could not be realised. Hence the culture of research publication, innovation and on-going sharing sessions with fellow peers and researchers was not visible and effective.

On the other hand, Respondent UB2 highlighted that the quality of life of a postgraduate students is usually fraught with high levels of stress, uncertainty, confusion, competition and isolation. Therefore more support in terms of guidance, counselling and facilities should be provided to support postgraduate study in IHL. Respondents also highlighted that postgraduate centres should be manned by both administrative and academic staff so that students could go there for help and guidance. Students should be able to get the latest information via email and also at centres with information regarding administrative matters like policies, processes and procedures on registration and payment of fees. If and where possible each department should have one-stop writing centres readily available for local students in Malaysia. Respondents UB2 and UA1 reiterated that a large majority of the postgraduate students need help in editing and proof reading their drafts.

15.4 Conclusion

Findings in this study revealed that effective postgraduate supervision is rather complex and involves supervisors having to take on multiple roles and responsibilities such as mentoring, coaching, advising and even managing student behavior at

times so that students can successfully complete their study within a stipulated and agreed upon time frame. Similar findings were also put forward by Barnes and Austin (2008) who investigated the role of doctoral advisors. Their study concluded that effective supervision involves multiple actions such as assessing students' strengths and limitations as well as fostering professional growth and helping students publish and attend conferences. They also highlighted the supervisors roles which extends beyond coaching and mentoring to advocating for their supervisees and chastening students with bad behaviour whilst rewarding good behaviour. In a bid to further enhance postgraduate supervision, there must be further clarification of the roles and responsibilities of supervisors in today's changing landscape of postgraduate supervision in higher education.

The results in this study also revealed that effective supervision is like 'good parenting' where the supervisor has to be a good role model for the postgraduate student. Hence supervisors must possess the knowledge, skills, values and right attitude to be exemplary researchers who can demonstrate their expertise by providing prompt and constructive feedback to their students. Furthermore they must engage their students with learning communities where they can disseminate their research findings through publications and presentations at academic conferences. The need for knowledgeable, skilled and exemplary supervisors has also been expressed by researchers such as Queeney (1996), Brown and Atkins (1988) and Frischer and Larsson (2000) who emphasize that students are recommended to select a supervisor with an established research record and is continuing to contribute to the development of his or her discipline.

Respondents in this study also indicated that effective supervision can only be realised if continuous professional development is provided to both supervisors and supervisees alike. Supervisors felt that doctoral students needed help to overcome their limited reading, writing, research and conceptual skills and facilities provided did not help students build learning communities. Furthermore a majority of the supervisors have not attended any formal supervision course and none of them were accredited supervisors. These supervisors expressed the need for continuous professional development in areas such as publishing, assessing theses effective coaching and mentoring and information on latest processes, procedures and policies on postgraduate supervision

Finally results in this study revealed effective postgraduate supervision can only be realised if institutions involved take an active role to upgrade their facilities and resources. This was also expressed by Lessing and Lessing (2004) who emphasized that postgraduate centres should be student-friendly with accessible administrative procedures and personnel with a good understanding of academic and scientific requirements of the research process. The importance of a resource centre with good facilities will enable students to work and study in a conducive and comfortable environment was also highlighted by Norhasni Zainal Abiddin and Affero Ismail (2011).

In conclusion it must be stressed that the high attrition and low completion rate among postgraduate students can be addressed via effective postgraduate supervision. Reducing attrition rates is critical to sustaining postgraduate study in IHL. This can be achieved through a concerted effort by all parties concerned. This was well expressed by Respondent UB2 who stressed that,

...effective supervision is critical for the success of a student and therefore every effort must be made to ensure there is a positive, supportive and trusting relationship between the student and the supervisor(s) at all stages of the study. . . by effective mentoring, coaching, advising and guidance the student should be helped to successfully develop into an autonomous self-directed researcher who can create and contribute new knowledge to his/her respective learning community.

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References

- Abiddin, N. Z., & Ismail, A. (2011). Attrition and completion issues in postgraduate studies for student development. *International Review of Social Sciences and Humanities*, 1(1), 15–29.
- Ahern, K., & Manathunga, C. (2003). Clutch-starting stalled research students. *Innovative Higher Education*, 28(4), 237–254.
- Alexander, D., & Davis, I. (2014, February 20). Do PhD supervisors make the grade? *Times Higher Education*. Retrieved on October 20, 2014. www.timeshighereducation.co.uk/features/do-phd-supervisors-make-the-grade/3/2011333.article
- Aranda-Mena, G., & Gameson, R. (2012). An alignment model for the research higher degree supervision process using repertory grids – Reflections on application in practice in built environment research. *Australasian Journal of Construction Economics and Building*, 12(3), 66–81.
- Baird, L. L. (1995). Helping graduate students: A graduate adviser's view. In A. S. Pruitt-Logan & P. D. Isaac (Eds.), *Student services for the changing graduate student population: New directions for student services* (pp. 25–32). San Francisco: Jossey-Bass.
- Barnes, B. J., & Austin, A. E. (2008). The role of doctoral advisors: A look at advising from the advisor's perspective. *Innovation in High Education*, 33, 297–315.
- Brabazon, T. (2009). 60 seconds of scholarship. *Times Higher Education*, March 25. Retrieved from <http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode>
- Brown, & Atkins. (1988). *Effective teaching in higher education*. London: Routledge.
- Cassuto, L. (2013). Ph.D. attrition: How much is too much? *The Chronicle of Higher Education*. Last retrieved July 3, 2014. <http://chronicle.com/article/PhD-Attrition-How-Much-Is/140045/>
- Chapman. (2009). *Draft insurance (Prudential supervision) bill released – Publications – Chapman Tripp*. [online] Chapmantripp.com. Available at: <http://www.chapmantripp.com/publications/Pages/Draft-Insurance-Prudential-Supervision-Bill-released.aspx>. Accessed 20 Oct 2014.
- Cullen, D. J., Pearson, M., Saha, L. J., & Spear, R. H. (1994). *Establishing effective PhD supervision*. Canberra: Higher Education Division, Australian Government Publishing Service.
- Delano, F., & Shah, J. (2006). Professionally packaging your power in the supervisory relationship. *Scottish Journal of Residential Child Care*, 5(2), 34–44.
- Frischer, J., & Larsson, K. (2000). Laissez-faire in research education—An inquiry into a Swedish doctoral program. *Higher Education Policy*, 13, 131–155.
- Gurr, G. M. (2001). Negotiating the “rackety bridge” – A dynamic model for aligning supervisory style with research student development. *Higher Education Research & Development*, 20(1), 81.
- Haksever, A., & Manisali, E. (2000). Assessing supervision requirements of PhD students: The case of construction management and engineering in the UK. *European Journal of Engineering Education*, 25(1), 19–32.
- Harman, G. (2003). PhD student satisfaction with course experience and supervision in two Australian research-intensive universities'. *Prometheus*, 21(3), 317–333.

- HEFCE. (2011). *PhD study – Trends and profiles: 1996–97 to 2009–10*, Issues Paper 2011/33.
- Johnson, W. B., & Huwe, J. M. (2003). *Getting mentored in graduate school*. Washington, DC: American Psychological Association.
- Kandiko, P., & Blackmore, C. B. (2012). *Strategic curriculum change: Global trends in universities*. London: Routledge.
- Kumar, V., & Bujang. (2011). *A handbook for post graduate supervision*. [online] UPM Press. Available at: http://penerbitupm.wordpress.com/2012/02/02/buku-buku-terkini-terbitan-penerbit-upm-2012/handbook_postgraduate1/. Accessed 20 Oct 2014.
- Latona, K., & Browne, M. (2001). *Factors associated with completion of research higher degrees* (Government report in Higher Education Series, 37). Canberra: Department of Education, Training and Youth Affairs – Higher Education Division.
- Lawson, G., Hein, S., & Stuart, C. (2009). A qualitative investigation of supervisees' experiences of triadic supervision. *Journal of Counseling & Development, 87*(4), 449–457.
- Lessing, N., & Lessing, A. C. (2004). The supervision of research for dissertations and theses. *Acta Commercial, 4*, 73–89.
- Organization for Economic Cooperation and Development, OECD. (2008). *Trends shaping education*. Paris: OECD.
- Sidhu, G. K., Kaur, S., Chan, Y. F., & Yunus, F. W. (2013). Postgraduate supervision: Exploring Malaysian students' experiences. *Procedia – Social & Behavioural Sciences, 90*, 133–141.
- Sidhu, G. K., Kaur, S., Chan, Y. F., & Yunus, F. W. (2014). Postgraduate supervision: Comparing student perspectives from Malaysia and the United Kingdom. *Procedia – Social & Behavioural Sciences, 123*, 151–159.
- Smallwood, S. (2004). Doctor dropout. *The Chronicle of Higher Education, 50*(19), 2.
- Ssegawa, J., & Rwelamila, P. (2009). The research skill factor as a cause for high postgraduate attrition rate. *Journal of Engineering, Design and Technology, 7*(3), 293–322.
- Wichmann-Hansen, G. M., Bach, L. W., Eika, B., & Mulvany, M. J. (2012). Successful PhD supervision: A two-way process. In M. A. R. B. Castano & G. Guner-Akdogan (Eds.), *Mentoring in academia and industry: Researching, teaching, and learning triangle* (pp. 55–64). New York: Springer (10 (2)).
- Yaghi, A. (2008). Good governance practices by local administration in Jordan and USA. *International Journal of Rural Management, 4*(1–2), 47–65.

Chapter 16

Understanding of Diffusion, Osmosis and Particulate Theory of Matter Conceptions Among Pre-service Biology Teachers

Mohammad Mubarrak Mohd Yusof, Nurashida Mohamad Halimin,
and Nurshamshida Md Shamsudin

Abstract This study was conducted to investigate the understanding of diffusion, osmosis and particulate theory of matter conceptions among pre-service Biology teachers. The respondents were 30 pre-service Biology teachers of a faculty of education, UiTM Shah Alam, Selangor. The Diffusion, Osmosis and Particle Theory (DOPT) Two-Tier Diagnostic Instrument and interview applied for the data collection. The items for the diagnostic test are based on the two-tier, multiple-choice format. The first tier consists of a response question and the second tier consists of possible reasons. Findings from the DOPT two-tier diagnostic instruments highlighted that the respondents' understanding of diffusion and osmosis were satisfactory good as 5 out of the 7 items was over 75 % which is within 80–99 %. However the understanding on particulate theory of matter was unsatisfactory as all seven items were less than 75 % and does not reached the benchmark set up. Interviews with four respondents provided useful insights into their understanding of the concepts of osmosis, diffusion and particulate theory of matter. Overall, findings indicated most of the respondents who participated in the study held misconceptions, which eventually affect their understanding of Osmosis, Diffusion and Particulate theory of matter. Among the misconceptions include concentration and tonicity, differentiating between osmosis and diffusion, effect of temperature on solubility, membrane, process of osmosis, change of state, dissolving, particles arrangement in solid, properties of solid and diffusion in gases and liquid.

Keywords Two-tier diagnostic test • Osmosis • Diffusion and particulate theory of matter concepts

M.M.M. Yusof (✉) • N.M. Halimin • N.M. Shamsudin
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: mubarrak@salam.uitm.edu.my; nurshamshida@salam.uitm.edu.my

16.1 Introduction

The National Malaysian Biology curriculum content is organized based on five major themes. The themes are Introduction to Biology, Cell as a Basic Unit of Living Things, Physiology of Living Things, Variation and Inheritance in Living Things, and Relationship between Living Things and the Environment. Meanwhile, the Chemistry curriculum content is organized based on four major themes. The themes are Introduction to Chemistry, Matter around Us, Interactions between Chemicals, and Production and Management of Manufactured Chemicals. There are several learning areas and contents of each theme. The Particulate theory of matter in the second theme of Chemistry curriculum is the basic concepts in chemistry. The mastery of this concept is important to the understanding of Osmosis and Diffusion concepts in the second theme of Biology curriculum. According to Reasoner (2011), the concept of osmosis and diffusion is vital to understand the nature of organisms and how they function. This shows that there is a relationship in understanding between Chemistry and Biology concepts and within the Biology concepts itself.

Therefore, the role of the teachers in mastering the concepts is essential before the teachers themselves deliver the knowledge to the students. The teachers need to minimize any misconceptions appear regarding the Osmosis, Diffusion and Particulate theory of matter. In order to do so, teachers can ask questions to the students and make them willing and not hesitate to share their idea. From the discussion teacher can detect the misconceptions and can correct them directly during that lesson. The misconception can be permanent and bring to next level. Howe (1996) said that the students need time to get used to and accept new ideas and other ways of understanding phenomena. Thus, it is the challenge for the teacher to solve this issue.

According to Alharbi (2012), pre-service teachers perceive that Diffusion and Osmosis cannot occur without the presence of a semi permeable membrane. It is therefore important that pre-service teachers have a thorough understanding of Osmosis, Diffusion and Particulate nature of matter. This is essential to make sure that the misconceptions they hold is not passed on their students before they begin their teaching careers. They also can deliver the concepts in an understandable way and at the same time avoid misconceptions bring by the students. Deriving from the above-mentioned facts, this study primarily aims to find out the understanding on Osmosis, Diffusion and Particulate theory of matter concepts among pre-service Biology teachers. This is because, looking at the studies about understanding on Osmosis, Diffusion and Particulate theory of matter concepts, there are vast majority of studies performed on school and university students around the world (Kahveci 2013; Odom and Barrow 1995; Tekkaya 2003; Westbrook and Marek 1991) including Malaysia (Izzati 2009) but lack on pre-service teacher (Alharbi 2012; Alharbi et al. 2014). Therefore, this study sought to determine the misconception on Osmosis, Diffusion and Particulate theory of matter concepts posses among the pre-service Biology teachers.

This research aim to answer on following research questions;

1. What is the nature of Diffusion conceptions among pre-service Biology teachers?
2. What is the nature of Osmosis conceptions among pre-service Biology teachers?
3. What is the nature of the Particulate theory of matter conceptions among pre-service Biology teachers?

16.2 Conceptual Understanding on Diffusion, Osmosis and Particulate Theory of Matter

Understanding diffusion and osmosis are beneficial in understanding various other life processes. Diffusion and osmosis is about understanding the process of water intake by plants, water balance of land and aquatic creatures and transport in living organism. The concepts of diffusion and osmosis can be easily experienced from our surrounding and daily life, as for students, these concepts are easily demonstrable in the laboratory without any use of harmful chemical substances. According to Alharbi (2012) diffusion is a broader term which refers to the movement of particles from areas of high concentration to areas of lower concentration which resulted to students and teachers, misunderstood this aspect of diffusion particularly when it is discussed in relation to the body. Osmosis is a net movement of water molecule from high concentration region of water to low concentration region of water across a semi-permeable membrane whereas diffusion is the net movement of the molecules or ions is from high concentration region to low concentration region until equilibrium is achieved.

16.2.1 Learning Theories in Science

According to Duit and Treagust (1995), Science teaching had been putting students' understanding towards science at hold since everything is about knowing but not understanding. Students may be able list every single scientific terminology existed but they have no in-depth understanding of the knowledge acquired.

For as long as it was remembered, teachers all around the world have been searching for most effective ways to make their students to understand science concepts. According to Alharbi (2012), there are two generally known theories that advanced to describe the acquisition of knowledge by human beings which are empiricism postulated by Aristotle, and nativism postulated by Plato and later by Chomsky. Based on these two theories, Tan conclude from a different perspective of empiricism stating that human being can acquire knowledge from their keen observation.

There are three general theory in teaching and learning process which are behaviourism, constructivism and cognitive. Behaviour theory involves observation and

changing of behaviour (stimulus and response) while cognitive theory is something that involves the mental and the brain processing or the information processing system that senses, stores, encodes and retrieves information. Rohizani state that constructivism approach involves students-teacher interaction where the teaching and learning is more towards students' centred. In learning Science constructivism approach is the best method to be use by teachers. This is because it allows students to create a link between their existing knowledge with the new knowledge and sharpen their reasoning and critical thinking.

16.2.2 Teaching Challenges

The conceptions and misconceptions of the students need to be challenged by the teacher. This need to be done so that students with misconceptions would not embedded the concepts they learnt into their cognitive permanently. Research shows that by simply following everything taught, many students only have a limited understanding of such science concepts (Duit and Treagust 2003). Teachers' fundamental knowledge should be strengthened and should be aware of the students understanding.

16.2.2.1 Misconceptions in Learning Science

Students failed to master chemistry because the subject is difficult to study (Alharbi 2012). The students have the knowledge about the subject but cannot apply to the questions that have been twisted a little resulting to misconception and hence making it totally incorrect. Due to this, students are unable to understand any advanced concepts due to weak understanding with fundamental concepts. Other than that, Sanger et al. (2001) in their research entitled Can computer animations affect college biology student's conceptions about diffusion and osmosis found that students pose many incorrect conceptions about Particulate theory of matter as they are having difficulties in answering visual conceptual questions. Students' misunderstanding will be integrated into their cognitive structures which would be hard to be corrected and subsequently affecting and interrupting their learning process (Alharbi 2012). Hence in order to avoid such situation where the students learn from inappropriate understanding, misconception in the study of science would be significant for the betterment of any fundamental concepts teaching. Furthermore, misconceptions are shared by many individuals within the same community and are hardly to be changed by traditional teaching methods. Moreover, the development of misconceptions usually involves logical thinking which seems to be understandable by them and can interfere with learning.

Students have difficulties in understanding the differences between matter and object, some of the students believe that there is no empty space between the particles (Alharbi 2012). Another misconceptions that the students have is pertaining the

Particulate theory of matter relates to changes in state. For example, students have problems in understanding the changes of the particles movement when the matter change from gas to liquid and liquid to solid. Alharbi (2012) found that students' conception of the Particulate theory of matter were unsatisfactory. Twelve misconceptions were identified from the study. Sanger et al. (2001) found that the students pose many incorrect conceptions about Particulate theory of matter. They stressed one of the major reason students have difficulty in understanding this principle is due to poor visualization ability. Meaning that, students are having difficulty in visualize the microscopic concept of the particle theory.

The misconception of diffusion and osmosis happen because the students are lacking with fundamental knowledge. According to Alharbi (2012) in her research about pre-service teachers' understanding of the concepts relating to diffusion, osmosis and the Particulate theory of matter and their attitudes towards science, there are about eight misconceptions arise from the DOPT diagnostic instrument regarding the diffusion and osmosis. One of the misconceptions is central vacuole of the plant cell will decrease in size due to salt absorbs the water from the central vacuole where about 21.6 % of the pre-service teachers claimed on that idea. Other than that, a study conducted by Treagust and Chittleborough (2001) found that this idea is the most common misconceptions appear among students. Other example of misconceptions is showed from the finding of Alharbi (2012) where she discover 18.5 % of the pre-service teachers agree that the sugar will be more concentrated on the bottom of the container and sink as it is denser than water. According to Tarakçi et al. (1999) it is most common misconceptions among the 9th and 11th grades students. It is well known that there are precise meaning in each term in Science compared to words used in literature and language. Odom et al. states that misconceptions among students arise due to difficulty in understand the meaning for scientific terms. According to Duit and Treagust (1995) students may be able to list every single scientific terminology existed but they have no in-depth understanding of the knowledge acquired for example the scientific meaning of the terms used. Thus, Oztas (2014) in his research about "How do High School Students Know Diffusion and Osmosis? High School Students' Difficulties in Understanding Diffusion & Osmosis" found that teacher need to explain the specific meaning of each term used in this osmosis and diffusion concepts as misconceptions usually appear because of multiple meaning interpret by students while learning the concepts.

16.2.2.2 Significance of Two-Tier Tests for Educational Practice and Research

Two-tier tests focuses on the understanding of the respondents rather than just having the knowledge to answer the questions. The first tier consists of questions with multiple choice answers that are based on the target content or the respondents' knowledge with additional alternatives (Alharbi 2012). The additional alternatives need to be rational with the questions so they would act as distracters. Respondents will be tested based on the strength of their content knowledge for each of the

questions. As for second tier, it consists of multiple choice options for each of the answers in first tier (Alharbi 2012). The second tier options are the reasons or explanations for the answers in the first tier. This will test the respondents' in-depth understanding of the knowledge that they acquired. According to Alharbi (2012), the benchmark to indicate the satisfactory understandings of the concept among students who have answered the item correctly are over 75 %. The two-tier tests are very beneficial instruments for the researcher in many aspects. According to Mann and Treagust (1998) this format would overcome the need for lengthy students' answers as they were required to justify every answer given. This will definitely save up the researcher time for collect for data and information from the respondents. Another aspect that can be looked at is this format shows its strength by helping science teachers to be aware of their students' conceptions and misconceptions. The instrument is useful to be used at the beginning or at the end of the topic. The first tier can test the students' knowledge and the item resemble in the second tier can promote higher thinking and reasoning skills of students. From the pattern of student understanding on the topic, teacher can modify the related lesson plan and use the appropriate teaching method. Two-tier tests are very successful in both educational and research setting. Haladyna and Downing (1989) stressed that the two-tier tests not only help teachers or the researchers to detect the student misconception but also can test the student's higher level of cognitive thinking.

16.3 Methodology

The diagnostic test data provided highly detailed information about the misconceptions of pre-service Biology teachers. Cetin-Dindar and Geban (2011) stated that two-tier diagnostic test can eliminate the limitation of ordinary multiple choice test with one-tier items. Two-tier diagnostic test able to determine students' misconceptions and can detect whether the students choose right answer by chance or understanding since the second tier of the test asks for a reason for the first tier response (Cetin-Dindar and Geban 2011; Cullinane 2011).

The semi-structured interview used by the researcher is different from the common interview. In this study the respondents were asked to answer the two tier questions first and then being probe by the researcher for each ideas and answers. Therefore semi-structured interviews provided information to support the diagnostic test results. According to Fraenkel et al. (2012), interview allows the researcher to clarify the questions asked and further tap on the problem under study.

According to Fraenkel et al.(2012), mix-method design is a combination of both quantitative and qualitative methods in a study. This design provides a complete understanding than either quantitative or qualitative alone (Byrne and Humble 2007). In this study, both quantitative and qualitative methods are given equal value to gain data in answering the highlighted research problems. Then, both findings

were combined and interpreted directly by comparing and contrasting it. Thus, this design may help the researcher to focus on the problem in depth, obtain more detailed information regarding the samples' understanding of the Osmosis, Diffusion and Particulate theory of matter conceptions. Not only that, it allow the researcher to enhance the validity and reliability of the findings (Denzin and Lincoln 2000; Johnson et al. 2007).

16.3.1 Two-Tier Diagnostic Test

A two-tier diagnostic test was used to collect the quantitative data for the study. Specifically it was used to measure the conceptual understanding and identify misconceptions about Osmosis, Diffusion and Particulate theory of matter among pre-service teachers. This diagnostic test allows the researcher to identify whether the students understand the key concepts or just memorize the facts. In this study the instrument is adopt and adapt from established sources which are Diffusion and Osmosis Diagnostic Test (DOT) used by Odom (1995) and Diffusion, Osmosis and Particle theory (DOPT) used by Alharbi (2012). All the items are already demonstrated an appropriate level of validity and reliability in previous studies. Hence the diagnostic-survey instrument were used with full of confidence. The items for the diagnostic test are based on the two-tier, multiple-choice format. The first tier consists of a content or response question with two, three or four choices. The second tier consists of three or four possible reasons for the first part: one desired reason and two or three alternative reasons. According to Odom (1995), the alternative reasons were based on misconceptions previously detected during a multiple-choice test with free response and interview sessions. The diagnostic test is a pen and paper instrument. It enables the respondents to give quick responds and it is immediately scored (Alharbi 2012). The instrument consisted of three sections; Section A, Section B and Section C. For the section A, the variables are mainly about the demographic background of the respondents including information on gender and current studied semester. The section B consists of 7 pairs of questions that examine the respondent's conception on Diffusion and Osmosis. The section C also consists of 7 pairs of questions but is intended to examine the respondents' conception on Particulate theory of matter. Like stated earlier, both Section B and C questions are multiple choice response followed by multiple choice reason that require the participants to circle one of the answer from both response and reason of each question. In total there were 14 pairs of questions to answer both research questions for the study. To avoid bias answers, Osmosis and Diffusion items were merged randomly. In fact, the first two research questions were answered from the Part B. The third research question was answered from Part C. The diagnostic instrument that answered by the samples are assured of anonymity.

16.3.2 Interview Protocol

Interview protocol is carried out to gain qualitative data. It is conducted as a mean to support the quantitative data obtained from the diagnostic test. There are two types of interview as a source to collect qualitative data which are structured and semi-structured interview. But for this study, the researcher used semi-structured interviews among four (4) respondents who are already taken the diagnostic test. Each of them was interviewed individually at a time convenient to them. The researcher has two set of questions about the Osmosis, Diffusion and Particulate theory of matter concepts in the interview schedule but at the same time ask and probe further ideas or statements that are given by the respondents. According to Alharbi (2012) probing can help the researcher can get a better picture of interviewee's response and allow the respondents to perceive as experts on the subject matter being discussed. Thus, the researcher can gain more in-depth information. Each interview lasted from 15 to 20 min. It depends on how much the respondents wished to discuss.

16.3.3 Validity and Reliability

According to Alharbi (2012), the data analysis that done based on theories and responsive research questions must also produce results that are meaningful to other people and described in an understandable language. Thus for this study, the researcher highlighted several content criterions. All the item used were adopt and adapt from established sources which are from Diffusion and Osmosis Diagnostic Test (DOT) used by Odom (1995) and Diffusion, Osmosis and Particle theory (DOPT) used by Alharbi (2012). Therefore they were already demonstrated an appropriate level of validity. Hence the diagnostic survey instrument were used with full of confidence. The items used in the previous research are reliable with Cronbach's alpha coefficient of 0.54. Even though the value is relatively low, yet it is acceptable value (Alharbi 2012). This is because the diagnostic test objective is to investigate conceptual understanding rather than placement or sorting purposes.

16.3.4 Data Collection Procedure

In order to collect quantitative data, the two tier diagnostic test about Osmosis, Diffusion and Particulate theory of matter was used. The diagnostic test was distributed to 30 pre-service Biology teachers purposely. Self-administrated test is conducted among Part 8 students whereas for part 7 students the researcher use e-mail survey to collect data from them. This is because they are having their

practical session during the researcher conduct the study. A face-to-face interview was conducted after all diagnostic test sheets are completely collected. Four pre-service Biology teachers are randomly selected among the 30 respondents of the diagnostic test. Along the session, each of the respondent's answer was recorded verbally. This is to help in data analysis procedure. The interview questions were semi-structured with the goal to gather data about their understanding on Osmosis, Diffusion and Particulate theory of matter in depth. The question asked in this interview session focused on the incorrect answers that the respondents thought to be correct and on the reasons why on that misconceptions. With respect to the semi-structured interview conducted, many unplanned questions were asked in order to follow up and clarify the unclear response and reasons. Each interview lasted from 15 to 20 min, depending on how much the respondents wished to discuss. Then, the data gained from the interview was transcribed and word-for-word translated for some of the Malay words used by the respondents are applied.

16.4 Findings

In total about 30 respondents, which are selected among pre-service Biology teachers completed the Diffusion, Osmosis and Particle Theory (DOPT) two-tier diagnostic instrument. Generally, a pre-service Biology teacher is considered has an understanding in the Osmosis, Diffusion and Particulate theory of matter if he or she selects correct answer for both response and reason option from the first tier and second tier respectively. However, the pre-service Biology teacher is consider having misconception if he or she selects one correct answer from either response or reason option or may select incorrect answer for both response and reason option.

The data gained from the DOPT two-tier diagnostic instruments showed that the respondents' conceptions of particulate theory of matter were unsatisfactory as all seven items were less than 75 %. The result gained does not reach the benchmark set up in the previous study. Therefore, finding revealed that the students having more difficulty in understand Particulate theory of matter compared to Osmosis and Diffusion. This finding is supported by Alharbi (2012). She found that the students' conception of the Particulate theory of matter were unsatisfactory. Sanger et al. (2001) found that the students pose many incorrect conceptions about Particulate theory of matter.

The data gained from the DOPT two-tier diagnostic instruments showed that the respondents' conceptions of osmosis were very good. Both items regarding the Osmosis concepts were over 90 %. This value exceeded the benchmark set up by previous study. In this study there are only 3 misconceptions on Osmosis concept analysed from the DOPT diagnostic instrument. Table 16.1 highlighted that at least one or two pre-service Biology teachers selected incorrect answers for different items.

Table 16.1 Comparison of the misconceptions held by pre-service biology teachers by concepts

Concept	Respondents	Misconceptions
1. Process of diffusion and particulate theory of matter	One and four	Particles move from high to low concentration because they tend to move until the two areas are isotonic
	Two	No misconception
	Three	1. Particles move from high to low concentration because there are too many particles crowded into one area; therefore, they move to an area; with more room. 2. Particulate theory of matter is a transport of substance process
2. Process of osmosis	One	After 2 h the water level in Side 1 will be the same because water will become isotonic
	Two	After 2 h the water level in Side 1 will be lower because water will move from the hypertonic to the hypotonic solution
	Three	No misconception
	Four	No misconception

16.4.1 Results from Interview

Four out of 30 pre-service Biology teachers were randomly selected and interviewed in order to further tap on their understanding of Osmosis, Diffusion and the Particulate theory of matter. The respondents were selected among the respondents who have finished the diagnostic test. Overall, most of the pre-service Biology teachers interviewed had almost the same perceptions and understanding about the given questions. In total, two sets of items were reported. The items were like three-tiers question where each respondent need to choose the best answer for the question ask, then provide with reason as well as comment about their justification of their answers in detailed.

16.4.1.1 Example for The Diffusion and Particulate Theory of Matter

Student teacher 1: Particles will generally move from (a) high to low concentrations because (3) the particles tend to move until two areas are isotonic, and then the particles stop moving.

Researcher: Can you describe more on your answer?

Student teacher 1: Meaning that the particles tend to move from high to low concentration region until one time the concentration will be same and there is no movement occur happen after that.

Researcher: Oh. Means that the isotonic is refers to the “same” concentration for both sides. Isn’t? Why you said so?

Student teacher 1: Yes. Because once the particles move from high to low, they will reach equilibrium.

Researcher: So, when the equilibrium is achieved it is the particles still moving or stop?

Student teacher 1: They still moving but they tend to remain there. This is because once they achieve the equilibrium state, there is no more different in concentration gradient, but the particles still moving at their position.

Researcher: But your answer to this question earlier is different. You said that the particles will stop at the end of the process.

Student teacher 1: Because I think no 3 is the best to represent the reason for my answer.

Researcher: If I gave this question without mentioning “the particles stop moving” what will be your answer?

Student teacher 1: Still A3

Researcher: In your opinion what kind of processes involve in this situation and why?

Student teacher 1: Diffusion because it involve particles move from higher concentration to low concentration which means down concentration gradient. Other than that, Particulate theory of matter because there are particles involves in the process.

16.4.1.2 Example for Process of Osmosis

The answer provided by Student teacher 1 is A2 at the beginning, then change to A3.

Student teacher 1: After two hours, the water level in Side 1 will be (a) higher because (3) the concentration of water molecules is less on Side 1.

Researcher: Do you think that would be correct answer?

Student teacher 1: Yes

Researcher: Can you explain?

Student teacher 1: Because in side 1 it contains dye and water. So the concentration of water in side 1 is low compared to in side 2. Thus, it will cause the water from side 2 to move to side 1 until the concentration for both sides remain the same.

Researcher: But you said that the answer will be higher so how come after 2 hours the concentration becomes the same?

Student teacher 1: Oh, no no no. I want to change my answer. After 2 hours the water level in Side 1 will be the same height.

Researcher: After reach the equilibrium, is the water particles still moving?

Student teacher 1: It still move but within the same place. Meaning that no movement of particles across the membrane anymore.

Researcher: In your opinion what kind of processes involve in this situation and why?

Student teacher 1: Osmosis. It is same with diffusion like what I have explained in the first question. It is same in terms of down concentration gradient. The movement of particles are from high concentration to low concentration but osmosis is for water molecules. The other one is Particulate theory of matter which involves the liquid particles.

16.5 Conclusion

The data gained from the DOPT two-tier diagnostic instruments showed that the respondents' conceptions of diffusion were satisfactory good as 3 out of 5 items was over 75 % which is within 80–95 %. According to Alharbi (2012), the benchmark to indicate the satisfactory understandings of the concept among students who have answered the item correctly are over 75 %.

In this study there are about 12 misconceptions on diffusion concept analysed from the DOPT diagnostic instrument. However, item no 5 which is about effect of temperature on solubility in diffusion process showed the strongest result for the study where 93.33 % of the respondents answering both tiers correctly. Odom and Barrow (1993) also found that 90 % of the students select correct combination of both tiers for the item. Nevertheless, in this study there is still misconception appear among some of the respondent. They tend to believe that diffusion occurs faster at a lower temperature as the cold temperature will speeds up the movement of molecules. In fact, students need to know that the diffusion rate increases when the temperature increases. This is due to the fact that as stated in the kinetic theory of matter, movement or particles collision is faster in a high temperature. It is therefore shows that understanding of Diffusion requires understanding of Particulate theory of matter concepts (Odom and Barrow 1993).

To summarize, there are still unfold misconceptions issues in grasping conceptual understanding in science. Surprisingly, study indicate that the teacher's trainee still held misconceptions, which eventually affect their understanding of Osmosis, Diffusion and Particulate theory of matter. Among the misconceptions include concentration and tonicity, differentiating between osmosis and diffusion, effect of temperature on solubility, membrane, process of osmosis, change of state, dissolving, particles arrangement in solid, properties of solid and diffusion in gases and liquid. In Science, misconceptions are uncompromised especially for science teacher preparation program. Stakeholders should take this under their consideration in planning the curriculum and teacher training as this will jeopardy the quality and standard of teaching science in our nation.

References

- Alharbi, N. N. (2012). *Pre-service science teachers' understanding of the concepts relating to diffusion, osmosis, and the particulate nature of matter and their attitudes towards science*. D.Sc.Ed. Curtin University, Science and Mathematics Education Centre.
- Alharbi, N. N., Treagust, D. F., Chandrasegaran, A. L., & Won, M. (2014). Influence of particle theory conceptions on pre-service science teachers' understanding of osmosis and diffusion. *Journal of Biological Education* (ahead-of-print), 1–14.
- Byrne, J., & Humble, A. (2007). *An introduction to mixed method research*. [PDF document]. Retrieved from lecture notes online web site: http://www.academia.edu/1476796/An_introduction_to_mixed_methods_research

- Cetin-Dindar, A., & Geban, O. (2011). Development of a three-tier test to assess high school students' understanding of acids and bases. *Procedia-Social and Behavioral Sciences*, 15, 600–604.
- Cullinane, A. (2011). P18: Two-tier multiple choice questions – An alternative method of formative assessment for first year biology students. *Effective Learning*, 70.
- Denzin, N. K., & Lincoln, Y. S. (2000). Triangulation 2.0. *Journal of Mixed Methods*, 6, 80–88.
- Duit, R., & Treagust, D. F. (1995). Students' conceptions and constructivist teaching approaches. In B. J. Fraser & H. J. Walberg (Eds.), *Improving science education*. Chicago: The National Society for the Study of Education.
- Duit, R., & Treagust, D. F. (2003). Conceptual change: A powerful framework for improving science teaching and learning. *International Journal of Science Education*, 25(6), 671–688.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). In N. York (Ed.), *How to design and evaluate research in education* (8th ed.). New York: McGraw-Hill Companies, Inc.
- Haladyna, T. M., & Downing, S. M. (1989). A taxonomy of multiple-choice item-writing rules. *Applied Measurements in Education*, 2(1), 37–50.
- Howe, A. C. (1996). Development of science concepts within a Vygotskian framework. *Science Education*, 80(1), 35–51.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.
- Kahveci, A. (2013). Diagnostic assessment of student understanding of the particulate nature of matter: Decades of research. In *Concepts of matter in science education* (pp. 249–278). Dordrecht: Springer.
- Mann, M., & Treagust, D. F. (1998). A pencil and paper instrument to diagnose students' conceptions of breathing, gas exchange and respiration. *Australian Science Teachers Journal*, 44(2), 55–59.
- Nur 'Izzati Bt Ali. (2009). Miskonsepsi dalam konsep osmosis dan resapan di kalangan pelajar tingkatan empat. Tanjong Malim: Universiti Pendidikan Sultan Idris.
- Odom, A. L. (1995). Secondary & college biology students' misconceptions about diffusion & osmosis. *The American Biology Teacher*, 57, 409–415.
- Odom, A. L., & Barrow, L. H. (1993). Third misconceptions seminar proceedings: Freshman biology non-majors misconceptions about diffusion and osmosis. Ithaca: Misconceptions Trust
- Odom, A. L., & Barrow, L. H. (1995). Development and application of a two-tier diagnostic test measuring college biology students' understanding of diffusion and osmosis after a course of instruction. *Journal of Research in Science Teaching*, 32(1), 45–61.
- Oztas, F. (2014). How do high school students know diffusion and osmosis?: High school students' difficulties in understanding diffusion & osmosis [Abstract]. *Procedia – Social and Behavioral Sciences*, 116, 3679–3682.
- Reasoner, A. (2011). *Teaching osmosis and diffusion through kidney dialysis*. Retrieved from <http://www.yale.edu/ynhti/nationalcurriculum/units/2011/7/11.07.07.x.html>
- Sanger, M. J., Brechelsen, D. M., & Hynes, B. M. (2001). Can computer animations affect college biology students' conceptions about diffusion & osmosis? *Journal the American Biology Teacher*, 63(2), 104–109.
- Tarakçi, M., Hatipoglu, S., Tekkay, C., & Özden, M. Y. (1999). A cross-age study of high school students' understanding of diffusion and osmosis. *Journal of Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 15, 84–93.
- Tekkaya, C. (2003). Remediating high school students' misconceptions concerning diffusion and osmosis through concept mapping and conceptual change text. *Research in Science & Technological Education*, 21(1), 5–16.
- Treagust, D. F., & Chittleborough, K. G. (2001). Chemistry: A matter of understanding representations. In J. Brophy (Ed.), *Subject-specific instructional methods and activities* (Vol. 8, pp. 239–267).
- Westbrook, S. L., & Marek, E. A. (1991). A cross-age study of student understanding of the concept of diffusion. *Journal of Research in Science Teaching*, 28(8), 649–660.

Chapter 17

Reorientation of Knowledge Among Primary School Teachers in Adopting a Transformed Classroom Assessment Policy

Rubiah Dalail, Chan Yuen Fook, and Gurnam Kaur Sidhu

Abstract The adoption of performance standards document as a teachers' guidance in classroom assessment demanded reorientation of teachers' knowledge in teaching. Without the right knowledge, no teaching practice can be executed as intended by the ministry. A survey on 291 Mathematics teachers in national primary schools located in Selangor shows that teachers perceived themselves as knowing the concept and practice of classroom assessment adopted by the Ministry of Education. However, the perceived knowledge was rated slightly above the tested knowledge score findings from the same survey. The mixed response from teachers interviewed in this study indicates that there was confusion regarding the current knowledge of classroom assessment especially on the understanding of authentic assessment, formative assessment and summative assessment. The interview findings suggested four groups of teachers; those who were confused, those who were accustomed to traditional approaches, those who were on the same page with the current understanding and those who could not care less. Constant self-improvement and professional development are seen as methods to reinforce knowledge among teachers.

Keywords Authentic assessment • Classroom assessment • Formative assessment • Summative assessment

17.1 Introduction

Public expectation of students' achievement in central examination, play a major role in shaping the way teachers teach. Consequently, teachers are framed to teach to the test as grade serves as a motivational function for the comparison of performance

R. Dalail • C.Y. Fook, Ph.D. (✉) • G.K. Sidhu, Ph.D.
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: yuenfook@salam.uitm.edu.my; gurnamsidhu@salam.uitm.edu.my

among the students. In conjunction with lessening the culture of teaching to the test, the Examinations Syndicate in 2011 introduced performance standards document to facilitate teachers with the new outlook of classroom assessment. The Examinations Syndicate has been disseminating the knowledge on classroom assessment via intensive training to the key personnel in schools. Effective classroom assessments demand teachers to relearn and unlearn what they know and have been practicing. Has the classroom assessment knowledge been sustained among teachers across schools? This question has motivated the writer of this paper to examine the degree to what extent teachers know about classroom assessment.

17.2 Literature Review

Many scholars dictate that classroom assessment is indeed formative assessment (Edman et al. 2010; Garies and Grant 2008). Normally, formative assessment is best conducted in authentic ways (William and Leahy 2007; Guskey 2007), and is also known as assessment for learning (Segers et al. 2003). Its purpose is to improve the quality of students in the process of their learning. However, summative assessment is still very much relevant in classroom assessment practice when teachers want to do grading and positioning of students (Shepard et al. 2005, p. 276). Therefore, teachers' knowledge of classroom assessment must be directed at process as well as product.

17.3 Methodology of the Study

The objective of the study is to examine the extent of teachers' knowledge of the transformed classroom assessment policy in grade A national primary schools in Selangor. The various forms of assessment terms, including formative, summative, and authentic, compound the examination. The use of mixed method in the study has enabled the adoption of a triangulation of measures that was carried out using three different instruments, namely survey, multiple choice test and interview. Items in the form of 5-point Likert scale, adapted from Edman et al. (2010), were used in the survey. The Cronbach alpha for the 29 items in the survey has been estimated at .955. A multiple choice test of 25 items, on the other hand, has inflated the alpha reliability index of .401. The inflated index is common in mixed elements of speeded and power test such as the MCQ test used in the study (Cresswell 2005; Kubiszyn and Borich 2003). Eleven teachers from urban and rural school locations were interviewed to enrich the findings collected from the survey and test instruments.

17.4 Results and Discussion

17.4.1 *Demographic Information of the Respondents*

The profile of the 291 teachers surveyed in the study gives a general view of the typical Malaysian schools where the declining presence of male teachers within the teaching profession is seen. The majority of the teachers were female teachers (81.4 %) while the rest (18.6 %) were males. This study shows that female teachers are 4.39 times more than male teachers. However, this study did not specifically explore issues relating to gender imbalance within the teaching profession. The significance of quality teaching, irrespective of gender, is not in dispute as most of the teachers were university graduates (57.8 %) with at least a first degree of educational level.

17.4.2 *Knowledge in Classroom Assessment*

Chan et al.'s (2006) study on the implementation of school based assessment reveals that their respondents still do not have sufficient knowledge for the successful implementation of school based assessment. The composite results of this study further supports Chan et al.'s (2006) findings, specifically on classroom assessment. One of the issues that emerged from these findings is teachers' knowledge on the transformed policy. Teachers, as the implementers, must understand precisely what the aim of the education policy is; without proper knowledge, the connection to improvement may be missed. For example, the quality of classroom assessment is not merely a form of procedural process, but what is more important is the substance towards assessment for learning (Stinggins 2007, p. 17). To examine teachers' knowledge on consonance with the transformed policy, teachers were asked on what they know about performance-standard. From the responses, roughly, teachers knew what performance-standard was. A few of the teachers interviewed ($n=3$) were responding on the 'form' of the performance-standard by elaborating merely on the 'form' or procedural process that students were evaluated according to 'Bands'. These teachers' responses suggested that they were not really aware of specific objectives of performance standards. They were only vaguely conscious of the objectives. Most ($n=7$) were elaborating on the 'substance' or the outcome of performance-standard i.e. to measure the development and growth of the students. A distinct response that differentiated 'forms' over 'substance' of performance standard definition was highlighted by respondent T1; "*Students will be evaluated according to bands*" [T1, non-option, teaching Year 1 and Year 2, urban school]. Also in support of this definition was respondent T8; "*Performance-standard is a reference document for teacher to teach students.*" [T8, non-option, teaching Year 1, rural school]. Better and meaningful definitions were given by these two teachers who were highlighting the 'substance' of the performance-standard:

Table 17.1 Overview of teachers' knowledge in classroom assessment

Dimension of knowledge	<i>n</i>	<i>Mean</i>	<i>SD</i>
Understanding students' needs	287	4.00	.47
Assessment strategy	283	3.86	.48
Teaching strategy	274	3.59	.61
Professional development strategy	283	3.53	.78

Indicators: 1 = Don't know at all; 2 = Don't know; 3 = Unsure; 4 = Know; 5 = Know very well

- *"It is a guideline used in teaching-learning. From this, teachers know students' potential and what students need to perform."* [T5, non-option, Year 2 and Year 3 teacher, rural school]
- *"Performance-standard is a measurement or benchmark to measure students' growth level in a topic."* [T6, subject option, Year 2 and Year 3 teacher, rural school]

Nevertheless, respondent T7 sounded confused on performance-standard definition, this respondent was unable to distinguish between the function of curriculum standards and performance standards. Respondent T7 explained that she was teaching based on performance standards (evidence), in this case, she would not be covering all of the curriculum content as some of the curriculum is meant for learning process only and not applicable for performance assessment purposes.

"Performance-standard is replacing Curriculum syllabus of KBSR by means of terminology and content, explanation and details. It is more towards explanation or yearly plan. Teaching is based on evidences." [T7, non-option, Year 1 and Year 2, rural].

Another issue emerging from the study is on general knowledge of the integration of assessment in classroom practice. The survey findings show that teachers in this study perceived positively their acquired knowledge in these areas. Faizah (2011) also discovered that her respondents indicated positive perception of the school-based assessment concept. Table 17.1 presents the positive tone of teachers' perceptions of classroom assessment knowledge.

In general, all the mean values illustrated in Table 17.1 on teachers' self-rated knowledge suggest that teachers perceived that they were somewhat familiar with the concepts of classroom assessment by their rating on the 'know' statement, with the highest mean score $M=4.23$ and the lowest mean score $M=3.73$. The means index of each domain reveals that teachers perceived that they barely knew on "understanding students' needs" ($M=4.00$, $SD=.47$), slightly unsure on 'assessment strategy' ($M=3.86$, $SD=.48$), and moderately unsure on teaching strategy ($M=3.59$, $SD=.47$) and professional development strategy ($M=3.52$, $SD=.78$).

17.4.2.1 Understanding Students' Needs

Teachers' knowledge in understanding students' needs reflects that they were moderately unsure whether their students needed to be taught on their own work assessment ($M=3.75$, $SD=.69$). Teachers perceived that they were slightly unsure on the four strategies on understanding students' needs; that the students needed space to

Table 17.2 Teachers' knowledge in understanding students' need

Items	<i>n</i>	<i>M</i>	<i>SD</i>
Students need to be taught on their own work assessments	286	3.75	.69
Students must be given ample space to discuss their performance	286	3.90	.66
Students should be fully informed on their expected learning standard	286	3.92	.72
Students should be fully informed on what performance standard they can acquire	287	3.96	.66
Feedback to students must be on the quality of their performance	286	3.99	.57
Students must be involved in determining what they need to do	285	4.02	.60
Students have the right to know and be informed on their learning quality	286	4.06	.64
Students need to be on the alert to be more responsible in their learning processes	285	4.14	.54
Students need constructive feedback to improve their performance	284	4.23	.62

Indicators: 1 = Don't know at all; 2 = Don't know; 3 = Unsure; 4 = Know; 5 = Know very well

discuss their performance ($M=3.90$, $SD=.66$), students should be fully informed on their expected learning standard ($M=3.92$, $SD=.72$), students should be fully informed on what performance standard they can acquire ($M=3.96$, $SD=.66$), and feedback to students must be on the quality of their performance ($M=3.99$, $SD=.57$). However, teachers' knowledge is slightly better as they perceived they slightly know in terms of students must be involved in determining what they need to do ($M=4.02$, $SD=.60$), students have the right to know and be informed on their learning quality ($M=4.06$, $SD=.64$), and students need to be on the alert to be more responsible in their learning processes ($M=4.14$, $SD=.54$). Students need constructive feedback to improve their performance ($M=4.23$, $SD=.62$) was perceived as a moderately known strategy by teachers (Table 17.2).

17.4.2.2 Assessment Strategy

The findings disclose that teachers perceived that they were slightly unsure on assigning homework ($M=3.73$, $SD=.72$), conducting interview ($M=3.81$, $SD=.65$), giving quizzes ($M=3.89$, $SD=.58$), and practicing observation ($M=3.92$, $SD=.63$) as strategies in formative assessment. What they perceived as a good assessment strategy was giving exercises ($M=4.03$, $SD=.57$) (Table 17.3).

17.4.2.3 Teaching Strategy

In general, teachers perceived that they slightly knew the teaching strategies suggested in the survey. However, they rated that they were slightly unsure on three strategies namely on the fact that students' performance assessments require authentic methods ($M=3.76$, $SD=.76$), teachers have to integrate performance assessment with teaching-learning ($M=3.98$, $SD=.57$) and teacher has to translate curriculum standards into

Table 17.3 Teachers' knowledge in assessment strategy

Items	<i>n</i>	<i>M</i>	<i>SD</i>
Effective teacher uses homework as a formative assessment tool	286	3.73	.72
Effective teacher uses interview as a formative assessment tool	286	3.81	.65
Effective teacher uses quizzes as formative assessment tool	286	3.89	.58
Effective teacher uses observation as a formative assessment tool	286	3.92	.63
Effective teacher uses exercises as a formative assessment tool	286	4.03	.57

Indicators: 1 = Don't know at all; 2 = Don't know; 3 = Unsure; 4 = Know; 5 = Know very well

Table 17.4 Teachers' knowledge in teaching strategy

Items	<i>n</i>	<i>M</i>	<i>SD</i>
Students' performance assessments require authentic methods	283	3.76	.76
Effective teacher integrates performance assessment with teaching-learning	282	3.98	.57
Effective teacher translates curriculum standards into teaching-learning	285	3.99	.60
Effective teacher gives students immediate feedback after assessments	285	4.01	.62
Feedback helps teacher re-strategize teaching methods to the needs of students	285	4.04	.58
Formative assessments help teacher monitor students' performance growth	286	4.05	.60
Effective teacher strategizes the integration of assessments into teaching-learning	286	4.07	.60
Permanent perception of students' mastery is not from one or two observations	286	4.07	.63
Effective teachers collect enough evidence to be relatively certain of their students' mastery	286	4.13	.60
Effective teacher uses appropriate and reliable assessment methods	286	4.14	.56

Indicators: 1 = Don't know at all; 2 = Don't know; 3 = Unsure; 4 = Know; 5 = Know very well

teaching-learning ($M=3.99$, $SD=.60$). Teachers perceived that they barely knew that teacher needs to give students immediate feedback after assessments ($M=4.01$, $SD=.62$), feedback helps teacher re-strategize teaching methods to the needs of students ($M=4.04$, $SD=.58$), formative assessments help teacher monitor students' performance growth ($M=4.05$, $SD=.60$), strategies help teacher in integrating assessments into teaching-learning ($M=4.07$, $SD=.61$), permanent perception of students' mastery is not from one or two observations ($M=4.07$, $SD=.63$). Teachers' perception slightly improved on the fact that they need to collect enough evidence to be relatively certain of their students' mastery ($M=4.13$, $SD=.60$) and the uses of appropriate and reliable assessment methods ($M=4.14$, $SD=.56$) (Table 17.4).

17.4.2.4 Professional Development

On professional development knowledge, teachers perceived that they barely knew the headmaster's role was to form and sustain teachers' learning community ($M=4.08$, $SD=.62$), to network them with experts ($M=4.08$, $SD=.62$) and to allocate time for

Table 17.5 Teachers' knowledge in professional development strategy

Items	<i>n</i>	<i>M</i>	<i>SD</i>
Effective headmaster forms and sustains teachers' learning community	285	4.08	.62
Effective headmasters network their teachers with experts	286	4.08	.62
Effective headmaster allocates time for teachers to acquire assessment knowledge	286	4.11	.58
Effective teacher always has time for professional enhancement on classroom assessment	286	4.21	.59
Effective teacher shares formative assessment ideas with other teachers	286	4.23	.53

Indicators: 1 = Don't know at all; 2 = Don't know; 3 = Unsure; 4 = Know; 5 = Know very well

Table 17.6 Test's items on formative and summative assessment

Item no	Correct response (%)	Incorrect response (%)	No response (%)
3	6.9 (20)	91.1 (265)	2.0 (6)
4	46.4 (135)	52.2 (152)	1.4 (4)
5	17.9 (52)	80.7 (235)	1.4 (4)
6	29.5 (86)	69.1 (201)	1.4 (4)
7	29.9 (87)	68.4 (199)	1.7 (5)
8	78.4 (228)	20.6 (60)	1.0 (3)
25	89.7 (261)	7.6 (22)	2.7 (8)
28	23.4 (68)	72.5 (211)	4.1 (12)

Note: Number in parentheses is frequency of teachers being assessed in each category

them to acquire assessment knowledge ($M=4.11$, $SD=.58$). On their part as teachers, they perceived as moderately knew that they should always have time for professional enhancement on classroom assessment ($M=4.21$, $SD=.60$) and share formative assessment ideas with other teachers ($M=4.23$, $SD=.53$) (Table 17.5).

However, the mean score from this survey item, teachers' perceived knowledge, was above the mean score gathered from teachers' tested knowledge scores to multiple choice items on classroom assessment test. In reflecting teachers' professional practice, perceived knowledge as well as tested knowledge plays an important role. Teachers' low mean score in tested knowledge, as compared to the perceived knowledge, in this study indicates that among teachers there was confusion regarding knowledge on classroom assessments. The discussion below highlights four main items in the test that reflect a discrepancy of knowledge.

17.4.2.5 The Difference Between Formative and Summative Assessment

Findings in Table 17.6 show that the respondents did not have a solid knowledge in summative assessment as only 6.9 % were able to distinguish the correct example of summative assessment (Item 3). Ironically, teachers (46.4 %) acknowledged the limited measurement capacity of summative assessment; measuring knowledge and comprehension (Item 4). However, only a minority of them (17.9 %) were able to

Table 17.7 Teachers' responses on the differentiation between formative assessment and summative assessment

Themes emerging from responses	Frequency of mention	Teachers' code
Mismatch definition	3	T1, T3, T4
Obsolete knowledge	4	T2, T7, T10, T11
Current understanding	2	T6, T8
No input	2	T9, T5

Source: Interview responses

discriminate that in general, summative assessment only measures knowledge and comprehension as questioned in Item 5. On the latest trends in classroom assessment i.e. formative assessment (Items 6 and 7), less than 30 % of the teachers were conscious on the matter. Confusingly, the finding shows that teachers unanimously (89.7 %) knew the benefit of formative assessment (Item 25). When questioned repetitively as they were in Item 3, majority of the teachers (72.5 %) were unable to distinguish the correct example of summative assessment in answering Item 28.

The interviewed responses show that obsolete knowledge in formative and summative assessment led to teachers' low degree of score in the multiple choice test. When teachers were interviewed on how they differentiated between formative assessment and summative assessment, many did not give clear definite responses. No definite separation between SA and FA had been given by the teachers. This conflict was seen by Taras (2005) who believes that "*until the centrality and indeed neutrality of SA is acknowledged, the real blossoming of FA will not and cannot occur.*" p. 476. Teachers' responses can be divided into four categories; mismatch definition, obsolete knowledge, current understanding and 'no input' for those who were not able to give any viable responses. Table 17.7 summarized the responses according to these categories.

Table 17.7 suggests four groups of teachers; those who were confused (giving mismatch definition), those who were accustomed to traditional approaches (obsolete knowledge), those who were with the current understanding, and those who could not care less (no viable response). However, the number of those in the confused zone ($n=4$) and trapped in obsolete knowledge ($n=4$) are alarming. The comments shared by teachers about the difference between formative assessment and summative assessment led the researcher to conclude that there is a discrepancy in the knowing as the respondents did not illustrate accurate meanings of formative and summative assessment. Respondents T1, T3, and T4 were giving mismatch definition of formative and summative assessment:

- "If I'm not mistaken, summative is on-going assessment. Formative...between two, I'm confused. Anyway I just do it." [T1, non-option, Year 1 and Year 2 teacher, urban school]
- "That one is written test or what? Summative is general and not only written". [T3, option, Year 3 teacher, rural school]
- "Formative is more to written tests, MCQ. Summative is via observation and oral test." [T4, non-option, Year 1 teacher, rural school]

Teachers with the obsolete knowledge is the biggest group ($n=4$); respondents T2, T7, T10, T11

- “*Formative is short term assessment. A topic only. Summative involved many topics in a test.*” [T2, option, Year 1 teacher, rural school]
- “*Formative assessment is conducted after a topic is covered while summative assessment is conducted by combining topics, for example mid-year and year-end.*” [T7, non-option, Year 1 and Year 2, rural].
- “*Formative is subtopic. If summative, it covers all topics.*” [T10, option, Year 3 teacher, urban school]
- “*Formative is monthly and topical. Summative year-end.*” [T11, option, Year 3 teacher, urban school]

The best response that is related to the current understanding was given by respondents T6 and T8:

- “*Formative is assessment done in classroom by questioning. Summative is giving a test.*” [T6, subject option, Year 2 and Year 3 teacher, rural school]
- “*Summative assessment is conducted at year-end, while formative assessment is conducted mid-year or monthly.*” [T8, non-option, Year 1 teacher, rural school]

Respondents T5 and T9 admitted that they cannot recall what they knew about formative and summative assessment:

- “*I cannot recall now. Formative is assessment in class...is it? I forgot.*” [T5, non-option, Year 2 and Year 3 teacher, rural school]
- “*Formative and summative? Forgot. Formative informal? Cannot recall.*” [T9, option, Year 2 and Year 3 teacher, urban school]

The evidence from the study suggests that the number of those in the confused zone ($n=3$) and trapped in obsolete knowledge ($n=4$) is alarming as scholars were also in dispute on the meaning and demarcation between formative and summative assessment (Taras 2005; Tuttle 2009).

17.4.2.6 Validity and Reliability of Assessment

Findings from Table 17.8 show that only a few teachers (35.4 %) knew the definition of reliability in assessment (Item 9). They (5.5 %) were able to distinguish a valid assessment in formative environment (Item 19). Even though only a few knew the exact definition of reliable assessment, but majority (83.8 %) were clear on one of the characteristics of reliability i.e. require multiple observation (Item 21). However, only a few (19.6 %) were able to differentiate reliability from validity (item 24). The majority (71.1 %) were able to grasp the importance of valid over

Table 17.8 Test’s items on validity and reliability

Item no	Correct response (%)	Incorrect response (%)	No response (%)
9	35.4 (103)	62.9 (183)	1.7 (5)
19	5.5 (16)	92.8 (270)	1.7 (5)
21	83.8 (244)	15.1 (44)	1.0 (3)
24	19.6 (57)	77.3 (225)	3.1 (9)
26	71.1 (207)	26.1 (76)	2.7 (8)

Note: Number in parentheses is frequency of teachers being assessed in each category

Table 17.9 Test's items on authentic assessment

Item no	Correct response (%)	Incorrect response (%)	No response (%)
10	57.4 (167)	40.9 (119)	1.7 (5)
18	41.6 (121)	45.0 (131)	13.4 (39)
23	86.9 (253)	11.0 (32)	2.1 (6)

Note: Number in parentheses is frequency of teachers being assessed in each category

reliable assessment (Item 26). Taken together, these results show a better statistic if compared to Chan et al. (2006) that reported a lower statistics. Only 14.4 % of their respondents obtained the right answer to the item on validity and 10.5 % on the reliability item.

17.4.2.7 Authentic Assessment

Table 17.9 points out that teachers' correct responses were more than average (57.4 %) on the importance of conducting authentic assessment on Level One students (Item 10). However, teachers' correct responses were below average (41.6 %) on the definition of authentic assessment (Item 18). The non-response rate ($n=39$) for this question was also the highest (13.4 %) among the test items. Even though the findings indicate that teachers were not familiar with the term 'authentic assessment', they (86.9 %) did know how to conduct it (Item 23).

The interview findings support the survey findings in Table 17.9 that teachers have very minimal knowledge on the current understanding of classroom assessment. Surprisingly, out of the eleven teachers interviewed, none of them knew the real meaning of authentic assessment. They claimed that they "*cannot recall, don't understand, never heard of it, don't know, not familiar*".

17.4.2.8 Standard-Referenced and Norm-Referenced Assessment

Table 17.10 shows inconsistent teachers' scores on interpreting standard-referenced and norm-referenced assessment items. The function of formative reporting was known by 41.2 % (Item 17). However, a majority of the teachers (82.5 %) indicated that they were strongly sure on the statement that standardized assessment permits comparison among students (Item 20). Teachers' score shows that the majority of teachers (82.1 %) knew the meaning of standard-referenced assessment. However, they (78.4 %) inversely responded the wrong key when the statement was rephrased using norm-referenced assessment term (Item 27). Almost average of the teachers (53.9 %) failed to know that the school is fully responsible for school assessment (Item 29). However, they (75.3 %) knew the importance of keeping students' portfolio or showcase file (Item 30).

Table 17.10 Test's items on norm and standard reference interpretation

Item no	Correct response (%)	Incorrect response (%)	No response (%)
17	41.2 (120)	57.7 (168)	1.0 (3)
20	82.5 (240)	16.5 (48)	1.0 (3)
22	14.8 (43)	82.1 (239)	3.1 (9)
27	18.2 (53)	78.4 (228)	3.4 (10)
29	42.9 (125)	53.9 (157)	3.1 (9)
30	75.3 (219)	21.6 (63)	3.1 (9)

Note: Number in parentheses is frequency of teachers being assessed in each category

This finding has given account that there is improvement in teachers' knowledge in term of classroom assessment interpretation if compared to Chan et al.'s (2006) finding. Teachers in their study obtained mean scores on these items ranging from 10.8 to 24.7 %.

17.4.2.9 Comparison Between Teachers' Perceived Knowledge and Tested Knowledge

Mixed findings in teachers' tested knowledge score reported in the above section indicates that there was confusion on the current knowledge of classroom assessments among teachers. This is illustrated in Table 17.11 that teachers across demographic variables were having mean score below 50 % with standard deviation, *SD*, of 8.842–11.271. The mean score index indicates that male teachers ($M=47.61$, $SD=10.371$) scored better than female teachers ($M=46.97$, $SD=10.420$). There were slight differences in mean performance of teachers between qualification categories. Teachers with advanced qualification score higher ($M=47.88$, $SD=10.151$) than teachers with basic qualification ($M=45.85$, $SD=10.749$). A similar pattern is shown by those serving longer in schools; senior teachers ($M=47.15$, $SD=10.553$) scored higher than junior teachers ($M=46.99$, $SD=10.281$). Age also plays a role as older teachers show a higher score ($M=47.65$, $SD=11.271$) than younger teachers ($M=46.88$, $SD=10.133$). Even though the mean scores were comparable between groups, a distinct difference in score is seen between teachers teaching in rural area ($M=48.48$, $SD=8.842$) compared to those teaching in urban area ($M=46.34$, $SD=11.095$).

In order to ascertain if there was any significant difference in the mean scores between the two groups of each demographic variable, a t-test was conducted. The t-test result in Table 17.11 reveals that there is no significant difference between and among groups based on various demographic variables: gender ($t=.407$, $p>.05$), academic qualification ($t=-1.630$, $p>.05$), experience ($t=-.127$, $p>.05$), age ($t=-.541$, $p>.05$) and location ($t=-1.683$, $p>.05$). It is also apparent that teachers' perceived knowledge mean scores show a similar pattern of findings as presented in Table 17.12.

Table 17.11 Teachers' tested knowledge score

Demographic variables		<i>n</i>	<i>M (%)</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>Sig. (2-tailed)</i>
Gender	Male	54	47.61	10.371	1.411	289		.407
	Female	237	46.97	10.420	.677			
Qualification	Basic	121	45.85	10.749	.977	285	-1.630	.104
	Advanced	166	47.88	10.151	.788			
Experience	≤10 years	134	46.99	10.281	.888	288	-.127	.899
	>10 years	156	47.15	10.553	.845			
Age	<40 years old	220	46.88	10.133	.683	288	-.541	.589
	≥40 years old	70	47.65	11.271	1.347			
Location	Urban	189	46.34	11.095	.807	289	-1.683	.093
	Rural	102	48.48	8.842	.876			
Overall			47.40	9.82	.58			

Table 17.12 Teachers' perceived knowledge score

Demographic variables		<i>n</i>	<i>M</i>	<i>SD</i>	<i>SE</i>	<i>df</i>	<i>t</i>	<i>SE</i>	<i>Sig. (2-tailed)</i>
Gender	Male	53	3.70	.44	.06	268	-.765	.07	.445
	Female	237	3.76	.46	.03				
Qualification	Basic	108	3.74	.41	.04	265	-.339	.06	.735
	Advanced	159	3.76	.49	.04				
Experience	≤10 years	129	3.72	.45	.04	267	-.746	.06	.456
	>10 years	140	3.76	.46	.04				
Age	<40 years old	207	3.72	.45	.03	267	-1.707	.07	.089
	≥40 years old	62	3.83	.46	.06				
Location	Urban	174	3.77	.47	.04	268	.933	.06	.352
	Rural	96	3.71	.43	.04				
Overall			3.75	11.40	.67				

Indicators: 1=Don't know at all; 2=Don't know; 3=Unsure; 4=Know; 5=Know very well

The t-test result in Table 17.12 reveals that there is no significant difference between and among groups based on various demographic variables: gender ($t = -.765, p > .05$), academic qualification ($t = -.339, p > .05$), experience ($t = -.746, p > .05$), age ($t = -1.707, p > .05$) and location ($t = .933, p > .05$).

The t-test on individual mean scores of teachers' perceived knowledge and tested knowledge resulted in similar pattern of reporting of no significant difference between and among group on various demographic variables. A deeper analysis was conducted on the mean scores of the two different type of knowledge, teachers' perceived knowledge and teachers' tested knowledge, known as paired t-test, com-

Table 17.13 Paired t-test between tested knowledge and perceived knowledge

Variables	<i>M</i> (%)	<i>SD</i>	<i>SE</i>	Paired differences					
				<i>M</i> (%)	<i>SD</i>	<i>SE</i>	<i>t</i>	<i>df</i>	<i>Sig.</i> (2-tailed)
Perceived knowledge	68.72*	11.40	.67	21.32	14.15	.83	25.53	286	.000
Tested knowledge	47.40	9.82	.58						

*Note: Teachers' perceived knowledge Likert scale (5 point scale) is assumed having the same magnitude, and for the purpose of comparison, the mean score ($M=3.75$) is converted to standardized 'percentage' score ($M=68.72$)

paring the repetitive assessment of teachers' perceived knowledge measured by self-rated items and tested knowledge measured by multiple choice items. The findings indicate that there is a difference in teachers' perceived knowledge and tested knowledge that is comparatively large ($M=21.32$, $SD=14.15$). Teachers' perceived knowledge mean score ($M=68.72$, $SD=11.40$) is larger than their tested knowledge mean score ($M=47.40$, $SD=9.82$). This t-test indicates that there is significant difference in the perceived knowledge and the tested knowledge ($t(286)=25.53$, $p<.05$) as shown in Table 17.13.

The findings in Table 17.13 indicate that teachers perceived that they knew more than 50 % of the classroom assessment knowledge but the multiple choice test result reported that they knew less than 50 % of classroom assessment knowledge.

17.5 Implication and Conclusion

Several implications could be derived based on these findings. Teachers tend to do classroom assessment naturally, and do not always realize whether they are doing formative assessment, summative or authentic assessment. There were indications that teachers were positively adopting the transformed classroom assessment, however, they were confused between the obsolete and the current knowledge. Mixed findings in the study indicate that relevant revision and modification on classroom assessment knowledge are not spread evenly. At this juncture, it is obvious that in-service training and professional development are much needed in order to address this matter. Knowledge education needs to be introduced and a culture of sharing it to be cultivated and developed.

References

- Chan, Y. F., Gurnam, K. S., & Md. Rizal, M. Y. (2006). *The knowledge and best practices of secondary school ESL teachers in school-based assessment*. Shah Alam: Universiti Teknologi MARA.
- Creswell, J. W. (2005). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (2nd ed.). Upper Saddle River: Pearson Merrill Prentice Hall.

- Edman, E., Gilbreth, S. G., & Wynn, S. (2010). *Implementation of formative assessment in classroom*. ProQuest dissertation and theses.
- Examinations Syndicate. (2011). *Surat Siaran Lembaga Peperiksaan Bil. 3 Tahun 2011: Pemakluman Pentaksiran Berasaskan Sekolah (PBS) Di Sekolah Rendah dan Menengah Rendah*. KPLP.003.07.14.05(1)
- Faizah, A. M. (2011). School-based assessment in Malaysian Schools: The concerns of the English teachers. *Journal of US-China Education Review*, 8(10), 1–15.
- Gareis, C. R., & Grant, L. W. (2008). *Teacher-made assessment: How to connect curriculum, instruction and student learning*. Larchmont: Eye on Education.
- Guskey, T. R. (2007). Formative classroom assessment and Benjamin S. Bloom: Theory, research, and practice. In J. H. McMillan (Ed.), *Formative classroom assessment: Theory into practice* (pp. 63–78). New York: Teachers College Press.
- Kubiszyn, T., & Borich, G. (2003). *Educational testing and measurement: Classroom application and practice* (7th ed.). New York: Wiley.
- Segers, M., Dochy, F., & Cascallar, E. (2003). The era of assessment engineering: Changing perspectives on teaching and learning and the role of new modes of assessment. In M. Segers, F. Dochy, & E. Cascallar (Eds.), *Optimising new modes of assessment: In search of qualities and standards* (pp. 1–12). Dordrecht: Kluwer Academic Publishers.
- Shepard, L., Hammerness, K., Darling-Hammond, L., Rust, F., Snowden, J. B., Gordon, E., Gutierrez, C., & Pacheco, A. (2005). Chapter eight: Assessment. In L. Darling-Hammond, J. Bransford, L. Darling-Hammond, & J. Bransford (Eds.), *Preparing teachers for a changing world: What teachers should learn and be able to do* (1st ed., pp. 275–326). San Francisco: Wiley.
- Stiggins, R. J. (2007). Conquering the formative assessment frontier. In J. H. McMillan (Ed.), *Formative classroom assessment: Theory into practice* (pp. 29–42). New York: Teachers College Press.
- Taras, M. (2005, December). Assessment – Summative and formative – Some theoretical reflections. *British Journal of Educational Studies*, ISSN 0007-1005, 53(4), 466–478.
- Tuttle, H. G. (2009). *Formative assessment: Responding to your students*. Larchmont: Eye on Education Inc.
- William, D., & Leahy, S. (2007). A theoretical foundation for formative assessment. In J. H. McMillan (Ed.), *Formative classroom assessment: Theory into practice* (pp. 29–42). New York: Teachers College Press.

Chapter 18

Academic Dishonesty Among Business Students: Cheating Acts and Proposed Ways to Reduce Cheating Behavior

Nor Azian Abdul Rahman, Norashikin Hussein,
and Mashitah Mohamed Esa

Abstract Cheating is not a new phenomenon but a well-known type of academic dishonesty that occur among students regardless level of education in both private and public universities. In order to produce a first-class quality of manpower in the future, academic field plays an important role in shaping the students. Previous studies found that business students cheat more than their non-business-student peers. To date, there is limited evidence on cheating and guidelines to prevent cheating behaviour among business students especially in Malaysian context. Thus, the objectives of the study are: (1) to identify the cheating engagement acts commonly used by business students; and (2) to determine the most efficient ways to reduce cheating behavior among business students. A total of 120 sets of questionnaire survey were collected across 4 academic programs offered by the faculty of a public university in Malaysia. The findings revealed that most of the students used extra help during exam. Furthermore, it was suggested that cheating behaviour can be reduced through code of ethics, public campaign and increased supervision. Implications and future research directions are discussed.

Keywords Cheating • Academic dishonesty • Business students

18.1 Introduction

Academic dishonesty can be considered as a global phenomenon that occurs in many countries. According to Nazir and Aslam (2010), academic dishonesty is one of the greatest concerns in higher learning education for the past decades. There are several common forms of academic dishonesty of which includes cheating,

N.A.A. Rahman (✉) • N. Hussein • M.M. Esa
Faculty of Business Management, Universiti Teknologi MARA,
42300 Puncak Alam, Malaysia
e-mail: norazian9829@salam.uitm.edu.my

plagiarism, multiple submissions, inventing or falsifying information and many more. In addition, the issue of academic dishonesty with regards to cheating has strong tendency for future unethical and dishonest behaviors at the workplace which had been exhibited since undergraduate education level. Based on previous literature, it was found that this issue has been studied abroad in many countries such as United States (US), United Kingdom, Canada, New Zealand and others. Previous researcher, Grimes (2004) did a study on undergraduate students from eight Eastern European countries and former Soviet Republics in Central Asia, and found approximately 76 % of the students had personally cheated while in colleges.

According to Smith and Smith (2012), cheating is a major attitude that students often commit. Cheating starts at school and then continued to college as students think it is a major contributor of their success. According to a research made by McCabe et al. (2006), business students tend to cheat more as compared to non-business students. Klein et al. (2007) also added that business students have more lenient attitude towards what contribute to cheating behaviour. Therefore, it is fair to conclude that business school students are more likely to engage in academic misconduct compared to students in other programs. In addition, Bowers (1964) stated that business students involved with cheating more than other students. He claimed, about 66 % of the undergraduate business students in his survey of 99 campuses reported at least one incident of cheating such as using crib notes on a test, or turning in work done by another student in the previous academic year.

In Malaysia, there is a limited published study with regards to academic dishonesty especially on cheating behaviour among students of public institutions of higher education. According to Iberahim et al. (2012) there is an increased importance to find out the academic dishonesty problem in both public and private institution, since the students is important because these students are tomorrow's business leaders. In fact, as the cheating engagement acts among Malaysian students are still questionable, it would be interesting to explore the issue. Therefore, the objectives of this study are (1) to identify the cheating engagement acts commonly used by business students; and (2) to determine the most efficient ways to reduce cheating behaviour among business students. All the cheating engagement acts that commonly used by the students has been recognized. Thus, it is hoped that the findings of this study will enlighten the proposed actions that can be used to minimizing or preventing the students from cheating during test, exam or while doing their assignments.

18.2 Literature Review

18.2.1 Cheating

Academic dishonesty can be seen to be an increasing problem that arise among students both in public or private universities (Anitsal et al. 2009). In other words, academic dishonesty can be referred to as the action of cheating such as cheating during the examinations, copying off other people works and bringing notes during the examinations (Pino and Smith 2003).

Most literature's mentioned the common form of academic dishonesty includes cheating and plagiarism. Cheating is referred to as behavior where students use any kind of material with intention or attempt to use unauthorized materials, information or study aids in any academic exercise (Pavela 1978). While, plagiarism is defined as unauthorized use of ideas, suggestion, methods, language, data of another person without acknowledging the original source (Ellahi et al. 2013). In addition, Ellahi et al. (2013) mentioned that, the factors such as prior cheating behavior, ethics, alienation, peers and friends will influence a student's decision to involve in plagiarism.

According to Brown and McInerney (2008), the proportion of university students who cheat has risen over the years, particularly in the case of cheating during exams. Other researchers such as Haines et al. (1986), found that cheating had become more normative among students over the years and the main motivation for cheating was found to be competition for good grades. According to Siniver (2013) students who observed other students cheating will themselves tend to cheat more. He also mentioned that, if students observe a large amount of cheating, they will think it is an acceptable behaviour.

In a study conducted by Klein et al. (2007), he reported that youngsters and those with lower grade point average across all professional schools were more likely to be the serious cheaters. Students who did not excel in their studies tend to cheat to obtain good grades and improve their results. It indirectly shows that due to pressure in getting good achievements, students choose the easiest path to gain success which is through cheating. It was also found that one of the factors drives the students to conduct cheating is lack of moral integrity.

18.2.2 Cheating Engagement Act

Cheating behaviour varies and contributes to the increasing or decreasing level of cheating engagement act among students. According to Miller et al. (2008), an act or behaviour of a student indicates whether they would see cheating as dishonest and a sign of lacking in integrity.

In addition, Miller et al. (2008) also reported that there are sixteen types of cheating acts commonly used by students as per Table 18.2. Among the cheating acts used are helping someone else cheat on a test, copying from another student during an examination, getting question or answers from someone who has already taken a test, copying a sentence directly from a written or internet source without quotes or proper referencing and others.

In another study conducted by Klein et al. (2007), it was reported that the most egregious students cheating acts are using an unauthorized cheat sheet during exam, looking or copying from other student exam sheet during a test, collaborating on assignments that were supposed to be done alone and told another students the contents of exam question before she or he took the exam.

18.2.3 Efficient Ways to Reduce Cheating

Previous researchers (Meade 1992; Park 2003; McCabe et al. 2006), highlighted that business students ranked highest for self-reported level of cheating followed by engineering and humanities students. It shows that business students may cheat more than other students do.

One of the common ways to reduce cheating is implementing an effective code of ethics. McCabe et al. (2003) stated that a lower proportion of cheating at universities with code of ethics and that at universities where the lecturers are obligated by a code of ethics they will more closely supervise exams and put more effort into preventing cheating among their students. In addition, Jones (2011) reported that one of the most cited strategies used is through implementing an 'honor code'. Honor code is known as the written integrity policy as part of the course syllabus can minimise the acts of academic dishonesty among students.

According to Miller et al. (2008), the key of everything starts from the attitude. The increasing and decreasing level of cheating among business students are depending on the attitude of a person itself. Therefore, it is suggested that one of the way to reduce cheating is to increase supervision. Students need to be supervised more stern and being observed consistently to ensure that they did not get the chance or have the intention to conduct cheating.

Moreover, Siniver (2013) stated that students who prepare themselves in class will help to reduce cheating. In other words, by preparing yourself and make yourself equipped with enough knowledge will prevent one from committing the academic crime that is called as cheating. Furthermore, Siniver (2013) also suggested that punishments on those who were caught cheating should be more severe. By doing this, it will change the mindset of students that nothing really bad will happen even if they were being caught cheating at that time. Failing the particular subject or suspend the students from their studies are among the punishments that students do not want to go through. Therefore, this automatically will prevent them from cheating continuously in future.

18.3 Method

A quantitative research design was adopted for this research. This study was carried out in a public university in Malaysia. The informants in this study were the final year business students from four business degree programs. Data collection was conducted internally within the university by using questionnaires. Contacts were made with lecturers to request for their assistance in the distributions of questionnaires. The questionnaires were administered in classes during students' regularly schedule class times. Given the sensitive nature of the questions, respondents were repeatedly told, orally and in writing, that their responses would be anonymous and confidential. The survey questionnaire included three sections which are Section A,

B, and C. Section A comprised of the students' views on the cheating engagement acts using three point Likert scale with (1=Never, 2=Once, 3=More than one), while section B contained statement regarding the most efficient ways to reduce cheating behavior among students using five point Likert scale arranging from (1=Strongly agree and 5=Strongly disagree). The instruments were adapted from various literatures (e.g., Miller et al. 2011; and Siniver 2013) which have been proven to be reliable and valid. The last part, Section C consisted of demographic information questions. All data were analyzed using Statistical Package for Social Sciences (SPSS).

18.4 Results and Discussion

18.4.1 Demographic Profiles

A total of 150 sets of questionnaires were distributed among final year business students across four programs offered at business faculty of a public university in Malaysia. Out of 150 questionnaires distributed, only 120 were found to be usable for the study, yielding a response rate of 80 %. Of the students surveyed, male constitutes of 56.7 % and female constitutes of 43.3 %. Details of the demographic profiles are as per Table 18.1.

18.4.2 Cheating Engagement Acts Commonly Used by Business Students

Table 18.2 below enlightened which of cheating engagement act commonly used by business students. The data also were ranked according to the mean results. The most common acts used by business students are a) helping someone else cheat on a test ($\mu=2.58$, $SD=0.67$), followed by b) copying from another student during an examination ($\mu=2.55$, $SD=0.67$), and c) getting question or answers from someone

Table 18.1 Demographic profiles of respondents

Variable	Frequency	Percentage (%)
Gender		
Male	68	56.7
Female	52	43.3
Course		
Business Degree Program A	40	33.3
Business Degree Program B	44	36.7
Business Degree Program C	20	16.7
Business Degree Program D	16	13.3
Total	120	100.0

Table 18.2 Cheating engagement acts commonly used by business students

Variables	Mean	Standard Deviation
Helping someone else cheat on a test	2.58	0.67
Copying from another student during an examination	2.55	0.67
Getting question or answers from someone who has already taken a test	2.50	0.62
Copying a sentence directly from a written or internet source without quotes and proper referencing	2.50	0.62
Paraphrasing (copying with re-wording) a sentence from a written or internet source without footnoting or referencing it in the paper	2.32	0.50
Turning in a paper obtained from the website	2.05	0.70
Writing or providing a paper for another student	2.03	0.73
Receiving help on an assignment that exceeds that which would be acceptable to the lecturer	2.00	0.82
Using unpermitted crib notes or cheat sheets during a test	1.97	0.66
Using a false excuse to obtain an extension on a due date or to take a test at a different time	1.97	0.71
Participating in the exchange or sharing of a stolen copy of the test	1.93	0.68
Turning in a paper that you originally wrote for another class without awareness of the professor regarding its previous use	1.90	0.64
Turning in a paper copied, at least in part, from another student's paper	1.90	0.65
Turning in work done by someone else	1.93	0.68
Altering a graded test and submitting it as misgraded for extra credit	1.83	0.84
A form of cheating or academic dishonesty not addressed in this survey	1.33	0.60

Note: All items used a 3-point Likert Scale with (1 = Never, 2 = Once and 3 = More than once)

who has already taken a test ($\mu=2.50$, $SD=0.62$). Meanwhile, the three lowest ranks are: (a) turning in work done by someone else ($\mu=1.93$, $SD=0.68$), (b) altering a graded test and submitting it as misgraded for extra credit ($\mu=1.83$, $SD=0.84$), and (c) a form of cheating or academic dishonesty not addressed in this survey ($\mu=1.33$, $SD=0.60$).

18.4.3 Most Efficient Ways to Reduce Cheating Behavior Among Business Students

Table 18.3 described the most efficient way to reduce cheating. As we know, there are many ways that can be used by universities in minimizing cheating behaviour among students. From this study, it can be concluded that the most efficient way to reduce cheating behaviour is to conduct code of ethics ($\mu=1.93$, $SD=0.75$). Other than that, the respondents perceived that universities are encouraged to carry out public campaign on cheating ($\mu=1.87$, $SD=0.81$) and increased supervision by lecturers ($\mu=1.75$, $SD=0.87$). In addition, the other ways to reduce cheating are change in education structure, better preparation for classes and more severe punishment to those who are involved with cheating must be conducted.

Table 18.3 Descriptive analysis on the most efficient ways to reduce cheating

Variable	Mean	Standard Deviation
Code of ethics	1.93	0.75
Public campaign	1.87	0.81
Increased supervision	1.75	0.87
Change in education structure	1.73	0.71
Better preparation for classes	1.70	0.72
More severe punishment	1.68	0.77

Note: All items used a 5-point Likert scale with (1 = Strongly agree and 5 = Strongly disagree)

The study was conducted with the expectation that students have a clearer view on academic honesty that relate with cheating behavior. It is also explained the cheating engagement acts and the most effective ways to reduce cheating among business students. Generally, the research findings were consistent with those published in previous research.

According to Miller et al. (2008) there are sixteen types of cheating acts used by students as shown in Table 18.2. Referring to Table 18.2, it shows that the first cheating engagement act is helping someone else cheat on a test. Secondly ranked as perceived by the students is copying from another student during an examination. The findings were found to be similar to a study by Klein et al. (2007) reported that the most common cheating behavior among business students are collaborating with other students on assignments/exams that were supposed to be done alone and copying another students during exams. In addition, the third highest factor as perceived in the study is getting question or answers from someone who has already taken a test. The least factors ranked by the students are turning in work done by someone else and altering a graded test and submitting it as misgraded for extra credit. To combat these kinds of unhealthy practices, university should to be more explicit about their policy with regards to academic dishonesty.

Academic dishonesty such as cheating is a well-known academic disease among both public and private universities and it is on the rise without any valid solution to date. According to Siniver (2013), the cheating phenomenon wills harms both reputations of which includes the university and the students who do not involved with cheating. For ways to reduce cheating behavior among business students, it has been found that the most efficient ways in minimizing cheating is through implement code of ethics. This is supported by McCabe et al. (2003), they found lower proportion of cheating at universities where the lecturers are obligated by a code of ethics they will more closely supervise students' exams and preventing cheating effectively. In addition, Siniver (2013) reported students believe that signing a code of ethics will reduce cheating.

As suggested by Siniver (2013), the other ways to reduce cheating is through public campaign. The main objective of the public campaign is to create students awareness on the implications if they were caught cheating. It can be done through talks, seminar, banner and flyers. In addition, he claimed that students who involved

with cheating are also harming those who do not cheat by tarnishing the university image as well as reputation. The third highest ways in reducing cheating is increased supervision. A collaborative network among the lecturers throughout the learning institution is also deemed as important in order to create awareness on drawbacks on cheating. In addition, Siniver (2013), reported the most efficient way to reduce cheating on exams is more stringent supervision. Indeed, from his study claimed about 68 % believe the frequency of cheating during exams is affected by the level of supervision. Therefore, the lecturers must play an importance role by increase supervision during exams as a part of preventing cheating.

Furthermore, universities also have to play important role in preventing cheating among students in future. Even though punishment has been perceived to be the least preferred ways to reduce cheating, Siniver (2013) suggested that the most effective punishments are failing the course and suspension from studies. Indeed the findings from his study also reported that, about 62 % of the students felt that more severe punishment can reduce the phenomenon of cheating on exams. Many researchers believed that the growing competition among students nowadays tends to lead to a trend towards a rise in cheating phenomenon in both private and public universities.

To conclude, this study would serve as a significance contribution to the university, education sector in Malaysia, community and nation as a whole because students are future leaders. The results of this study suggest additional directions for future research. The findings of this study may not be generalized to other populations as students from other programs in other faculties might have different perceptions on cheating behavior. Therefore, for future research, it is suggested that the researcher should include respondents' across faculties or across universities as a larger samples in order to make this study more meaningful for education sector especially in Malaysia. In addition, future studies are advisable to apply longitudinal study and robust statistics such as regression analysis in order to obtain more significant result.

References

- Anitsal, I., Anitsal, M. M., & Elmore, R. (2009). Academic dishonesty and intention to cheat: A model on active versus passive academic dishonesty as perceived by business students. *Academy of Educational Leadership Journal*, 13(2), 17–26.
- Bowers, W. J. (1964). *Student dishonesty and its control in college*. New York: Bureau of Applied Social Research, Columbia University.
- Brown, R. S., & McInerney, M. (2008). Changes in academic dishonesty among business students in United States, 1999–2006. *International Journal of Management*, 25(4), 621–632.
- Ellahi, A., Mushtaq, R., & Khan, M. B. (2013). Multi campus investigation of academic dishonesty in higher education of Pakistan. *International Journal of Educational Management*, 27(6), 647–666.
- Grimes, P. W. (2004). Dishonesty in academics and business: A cross-cultural evaluation of student attitudes. *Journal of Business Ethics*, 49(3), 273–290.
- Haines, V. J., Diekhoff, G. M., LaBeff, E. E., & Clark, R. E. (1986). College cheating: Immaturity, lack of commitment, and the neutralizing attitude. *Research in Higher Education*, 25(4), 342–354.

- Ibrahim, H., Hussein, N., Samat, N., Noordin, F., & Daud, N. (2012). Academic dishonesty: Why business students participate in these practices? *Procedia Social and Behavioral Sciences*, *90*, 152–156.
- Jones, D. R. L. (2011). Academic dishonesty: Are more students cheating? *Business Communication Quarterly*, *74*, 141–150.
- Klein, A. H., Lecenburg, M. N., Mckendall, M., & Mothersell, W. (2007). Cheating during the college years: How do business school students compare. *Journal of Business Ethics*, *21*, 197–206.
- McCabe, D. L., Butterfield, K. D., & Trevino, L. K. (2003). Faculty and academic integrity: The influence of current honor codes and past honor codes experiences. *Research in Higher Education*, *44*(3), 367–385.
- McCabe, D. L., Butterfield, K. D., & Trevino, L. K. (2006). Academic dishonesty in graduate business programs: Prevalence, causes, and proposed action. *Academy of Management Learning & Education*, *5*(3), 294–305.
- Meade, J. (1992). Cheating is academic dishonesty par for the course. *Prism*, *1*, 30–32.
- Miller, A., Shoptaugh, C., & Parkerson, A. (2008). Under reporting of cheating in research using volunteer college students. *College Student Journal*, *42*(2), 326–339.
- Miller, A., Shoptaugh, C., & Wooldrige, J. (2011). Reasons not to cheat, academic –Integrity responsibility, and frequency of cheating. *The Journal of Experimental Education*, *79*, 169–184
- Nazir, M. S., & Aslam, M. S. (2010). Academic dishonesty and perceptions of Pakistani students. *International Journal of Educational Management*, *24*(7), 655–668.
- Park, C. (2003). Plagiarism by university students-literature and lessons. *Assessment & Evaluation in Higher Education*, *28*, 471–488.
- Pavela, G. (1978). Judicial review of academic decision making after Horowitz. *NOLPE School of Law Journal*, *8*, 55–75.
- Pino, N. W., & Smith, W. L. (2003). College students and academic dishonesty. *College Student Journal*, *37*(4), 490–500.
- Siniver, E. (2013). Cheating on exams: The case of Israeli students. *College Student Journal*, *47*(4), 593–604.
- Smith, K. J., & Smith, M. (2012). Academic dishonesty- cheating behaviour and other forms of inappropriate conduct. *Accounting Education: An International Journal*, *21*(3), 211–213.

Chapter 19

Confused, Bored, Excited? An Emotion Based Approach to the Design of Online Learning Systems

Teoh Kung-Keat and Jasmine Ng

Abstract Technology has somewhat challenged typically conservative higher education systems to change and move with the times. Current popular methods of classroom delivery technology or systems include MOOCs, Clickers, learning analytics and dashboard systems. Some systems now form basic building blocks of electronic learning such as Moodle, Blackboard etc. While online learning has taken higher education by storm, its effectiveness is arguable. Interestingly, many researchers believe that the holy grail of technologically enhanced tools in higher education lies in the replication of actual human aspects in the classroom. This paper attempts to address one of the missing but crucial natural elements in the online learning environment – emotion. While most current online teaching and learning systems often process user data through simple decisions using true or false processes i.e. understand or do not understand input, natural human communication is far more complex and rich. Communication involves emotions that can range from bored, excited, interested, confused, distracted, frustrated, angry, etc. In a classroom environment, scanning and assessing student behaviour and expressions enable a teacher to quickly change teaching strategies or pinpoint individuals who need special attention. This paper argues for emotion based online learning systems by discussing the merits of emotion based learning systems, highlighting current key research and advancements in emotion recognition systems, and outlining a proposed methodology and model for the study and implementation of such a system in higher education.

Keywords Affective system • Elearning • Emotion recognition

T. Kung-Keat (✉)

Student Learning Centre and School of Computer Science, Engineering and Mathematics, Flinders University, Registry Annex B18, GPO Box 2100, Adelaide, SA 5001, Australia
e-mail: teoh0036@flinders.edu.au

J. Ng

UniSA College, University of South Australia, GPO Box 2471, Adelaide 5001, Australia
e-mail: Jasmine.ng@unisa.edu.au

19.1 Introduction

It has long been known that natural human communication involves not only spoken language but also nonverbal communication. Bovee and Thill (2010, pp. 85–86) listed nonverbal communication as facial expression, gesture and posture, vocal characteristics, personal appearance, touch and time and space. Verbal and nonverbal forms of communication work hand in hand in natural language to enrich the context of messages. Context rich messages not only help the recipients understand the literal meaning of the message but also the underlying intent. For example, a person who says ‘yes’ to a set of instructions with bewildered and confused expressions relays a different message compared to a text message or email without the nonverbal aspects. In other words, natural human communication involves literal meaning and extended meaning of a message. This paper argues for the inclusion of emotion as an input to elearning systems. It also proposes a framework and implementation solutions for such systems.

19.2 Literature Review

A comprehensive discussion on the definition and background of emotion, studies on emotion and its relation to learning and teaching and a detailed description of previous studies and research on the development of affect based online systems is discussed.

19.2.1 *Emotion*

Aristotle describes emotions as either pleasure or pain or both (Dow 2014). Darwin in his book, *Expression of Emotions in Man and Animals* wrote that emotions are crucial to the survival of a species and that emotions show the true intent to the receiver (Buck 2006). Researchers have also determined that culture, gender and group behaviour influence how emotions are displayed and perceived (Elkman 1975 as cited in Fragopanagos and Taylor 2005). Emotion recognition is therefore important in natural human communication and its success. It is therefore essential for a message recipient to decipher the intended message correctly by recognising the correct emotional cues and associating their correct meaning.

Psychology researchers (Busso et al. 2004) have generally classified emotions into six types: surprise, fear, disgust, anger, happiness, and sadness. Neural researchers (Adolphs et al. 1996) have successfully demonstrated and proven that different locations of the brain are actively triggered when these six types of emotions are in play. The six emotion types identified by Busso et al. are popularly used in many emotion recognition systems due to the fact that they are easily distinguished and

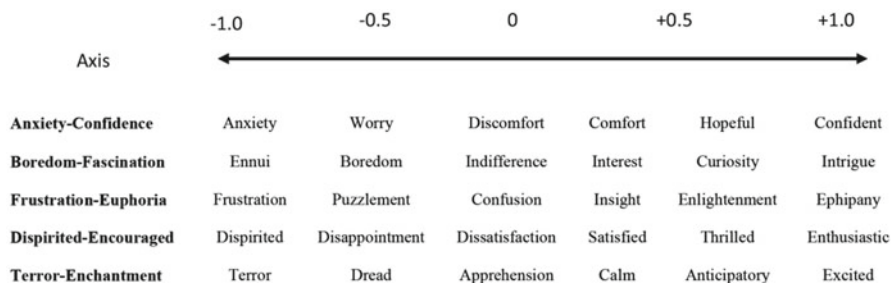


Fig. 19.1 Some emotions relevant to learning (Kort et al. 2001)

useful for many applications. Italics should be used for emphasizing words or phrase in running text, but do not format entire paragraphs in italics.

19.2.2 Emotion and Learning

Early educationists sought to eliminate emotion from the process of learning and teaching, believing that the acquisition of knowledge should be based purely on rational thinking. However, later research and studies in education argue that emotion is an important factor to consider in learning and teaching (Goleman 1995 cited in Alepis and Virvou 2011). According to Goleman (1995 as cited in Kort et al. 2001, p. 64), ‘the extent to which emotional upsets can interfere with mental life is no news to teachers. Students who are anxious, angry, or depressed don’t learn; people who are caught in these states do not take in information efficiently or deal with it well.’ In short, the importance of emotion in classroom teaching cannot and should not be dismissed lightly.

Kort and Reilly (2002) suggest six emotion axis in student learning (Fig. 19.1). They presented a model that relates emotions and the learning of science, mathematics, engineering and technology (Fig. 19.2). The spiral learning model suggests that students go through a cycle of four stages starting from Quadrant 1 and proceed to the following quadrants in anti-clockwise direction. In Quadrant 1, learners experience positive emotion as they are acquiring new knowledge. Learners moving to Quadrant 2 may be motivated to overcome confusion as they progress and experience challenges in understanding the subject content. Learners move to Quadrant III eliminating misconceptions and reinforce their knowledge as they proceed to Quadrant IV. The cycle continues as learners are presented with other stimuli.

Modern elearning and distance learning systems such as Moodle and Blackboard however, are devoid of emotional elements. While a teacher in class is always able to dynamically change his/her teaching strategies based on emotional feedback by students, typical elearning systems are not able to do so. An elearning system assumes that students either understand (and proceed) or do not (and replay or go back). It relies on student initiative to replay or go back. In short, current elearning

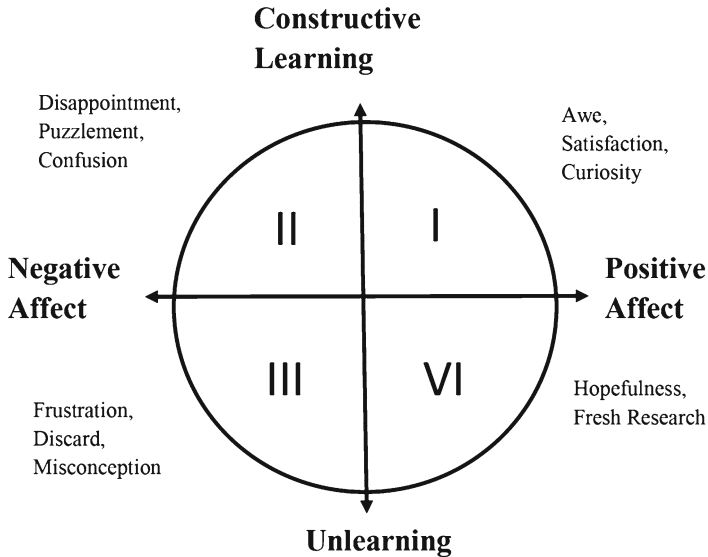


Fig. 19.2 Model relating phases of learning to emotions (Kort et al. 2001)

systems are static and do not respond actively to students' comprehension of lessons. In addition, current elearning systems also do not take into consideration learning speeds of students. It assumes that students watch a complete lecture video or slides at the same pace. It does not customise teaching speed to student learning speed. In a real classroom environment, a teacher could easily pick up the pace of his/her teaching if he sees that students are progressing well. Similarly, the teacher could also slow the pace of the lesson if he or she observes students struggling. The teacher's decision to pick up or slow down the pace will primarily be based on his or her observation of the students' expressions or responses to cues such as "do you understand?" or "do you follow?" In short, current elearning systems need to infer and act on emotional states of students to be more efficient and effective. The increasing relevance and importance of emotion based elearning systems can be observed from its standings in Gartner's Hype Cycle for Education reports. In 2011, Gartner (Lowendahl) classified such systems as 'technology triggers', almost at infancy stage. However its latest report (Lowendahl 2014) list it as 'on the rise', indicating its increasing importance in technologies for elearning.

19.2.3 Emotion in Learning and Teaching Technologies

The importance of emotion in classroom teaching and learning has been explored by researchers in many studies. As early as 2001, Kort (as cited in Craig et al. 2004) developed a model with four quadrants and hypothesized that students learn in

specific affective states. A study by Falout et al. (2009) on students of English as a Foreign Language in Japan discovered that students who are not able to control their emotions well tend to be less proficient learners. Researchers such as Hwang and Yang (2009) concluded that teachers who are able to manipulate and control the emotions of students tend to be more successful. These studies show that recognising and reacting to emotion is essential for effective learning and teaching in the classroom.

Since the last decade, researchers (Ben Ammar et al. 2010; O'Regan 2003) have recognised the importance of emotion in elearning technologies, many of whom noted that learning systems generally lack human to human interaction (Alepis and Virvou 2011). As such, a few emotion based elearning systems have been designed and proposed. In 2003, O'Regan conducted a qualitative study and concluded emotion to be critical for the success of online learning systems. O'Regan reported that previous studies acknowledge that online students experience various emotions while using elearning systems. O'Regan's study provides evidence that online students experiences various emotions while learning. In 2004, Craig et al. (2004, p. 241) observed and classified six types of emotions in an intelligent tutor system based on a study of respondents' reactions: frustration, boredom, flow, confusion, eureka and neutral. This study represents an early attempt to classify online student emotions. In 2005, Jones and Issroff (2005, p. 396) presented a comprehensive literature review which argued that while developmental psychology advocates 'cognitive, social and emotional' development, elearning technologies then seemed to have ignored emotional aspects completely.

19.2.4 Review of Emotion Recognition Elearning Systems

A few elearning systems which recognise emotion have been built during the last decade. In this section, we discuss two of these systems. The first is a typical elearning system incorporated with emotion recognition capabilities and the second is the virtual agent system (also popularly known as intelligent tutor system). We describe a system by Hwang and Yang (2009) and also provide an overview of typical agent elearning systems.

Hwang and Yang (2009) developed an elearning system which is able to identify the users' affective state of mind based on facial recognition. This system is one which typically exemplifies an elearning system which has been embedded with an emotion recognition feature. Hwang and Yang's system extracts features such as the size of the eye region, size of lip region, distance of eye position between frames, and size of skin region at forehead and applies fuzzy logic to classify the emotions. Their work shows that emotions from facial expression can be accurately identified. While Hwang and Yang have shown that emotions can be quite precisely identified in elearning systems based on facial expressions, they did not discuss what to do with the results of the emotion states thereafter. In addition, the system which has been built have several limitations, for example, users are not allowed to wear spectacles, and the background colour of the user has to contrast skin complexion significantly.

A number of agent based interactive virtual tutors which process emotions have also been designed and created by researchers (Alepis and Virvou 2011; Bartlett et al. 2006; Ben Ammar et al. 2010; Craig et al. 2004; Vogt et al. 2008). These systems employ a variety of methods to detect and identify emotions. Often they are also designed to provide appropriate outputs based on an emotion feedback e.g. encouragement to students who seem frustrated. The basis for the creation of agent based systems is to duplicate a real classroom teacher. This often includes the use of an avatar (image), voice (text-to-speech technology), animation (movements and gestures), and sometimes natural language (natural language processing). In other words, most artificial agents not only process and identify emotions from users, but also provide natural emotion rich feedback to students. In theory, such a system is ideally closest to the real life classroom environment. However, in spite of the fact that such agents have been in existence for almost a decade, the use of artificial agents or avatars have arguably never really taken off in a big way. Instead, feedback from users often shows that they find artificial agents obtrusive and annoying, one popular example being the infamous Microsoft Clippit (Rudman and Zajicek 2006). A study by Baylor (2000, p. 373) also found that success constraints for such agents in elearning include having minimal or little 'regulated intelligence, existence of a persona, and pedagogical control'. In short, while the idea of a virtual agent seemed theoretically ideal, constructing one which will gain user acceptance will require the development of other characteristics, may not be worth the development time and effort.

19.3 Method

We analyse five types of potential computational methodologies to recognise emotion for elearning: text, speech, biosignals, facial recognition and multimodal approaches. We did not consider methodologies such as gesture, gait or posture recognition which we believe to be less suitable for an elearning system due to conditions or constraints of the learner, learning environment and system development.

19.3.1 Text

Emotional context in text is often examined by literary critiques and linguists. Literary critiques scrutinise literary texts to look for cues to interpret characters' direct or indirect emotions. Barton (1996) argues that understanding emotional meaning allows readers to comprehend stories better. A study conducted by Hancock et al. (2007, p. 931) found that humans use the following strategies to express emotions in texts: changes in degrees of agreement to the respondent, use of negative affect terms (but not positive affect terms), use of punctuation for positive emotion, and increased speed in response and verbosity in positive emotions. In short, written

texts often reveal the writers' emotions. It is also interesting to note the popularity of emoticons among web users, which suggests that users find mere words insufficient to express their feelings.

While texts and emoticons are arguably the most easily available input for a computer based emotion recognition system, they are not without limitations. First, social and cultural researchers have found that emotion is expressed differently in text and emoticons across different cultures (Park et al. 2013). This presents a problem for an emotion based elearning system, primarily due international demographic of student population in most institutes of higher learning. Secondly, it is rather easy for users to hide their emotions intentionally in their texts by using neutral texts. This makes it difficult for emotion recognition systems to recognise emotions. This can possibly be achieved by using vague or neutral sentences, or even very formal language.

19.3.2 Speech

The introduction of audio telecommunications by Bell allowed humans to detect and recognise emotions through speech. Typically, emotion in speech can be detected through vocal or acoustic characteristics such as pitch, tone or energy (Busso et al. 2004; Fragopanagos and Taylor 2005). Learning algorithms in such emotion recognition systems detect the change in pitch and/or energy patterns of streaming audio and a classifier assigns the type of emotion associated to the change. A typical example of a speech based emotion recognition system is the Jerk-O-Meter, which monitors phone conversation and detects stress levels in speech (Vogt et al. 2008).

While the research in speech based emotion recognition systems has reached an arguably mature stage, it is rarely used in typical learning management systems. Instead, it has been used quite effectively in tutoring systems, especially where embodied characters are used to represent an artificial tutor or agent. Some avatar based artificial agents which respond to emotions have been developed over the last two decades (Alepis and Virvou 2011; Ben Ammar et al. 2010; Craig et al. 2004). However, few (if any) have been commercialised and used successfully in large scale university wide platforms. We also argue that the use of speech input for emotion detection is not suitable in elearning considering it is unnatural for elearning students to talk to a computer system in most learning management systems. The fact that many students access learning management systems in public spaces such as libraries makes it very difficult to implement a speech based elearning system.

19.3.3 Bio-signals

While professional actors can learn to control their facial expressions and voice, it is very difficult to hide physiological changes and responses in our body. Scientists have confirmed that the physiological responses can be used to detect emotion with

devices such as lie detectors. Popular methodologies for such systems include blood pressure, oxygen level in the blood, skin conductance, heart rate or pulse rate and electrocardiogram signals (Kim et al. 2004). Often, more than one type of physiological signals are used for improved accuracy. Kim et al. (2004) for example, used electrocardiogram, skin temperature variation and electro dermal activity, and reported a 78.43 % for recognition of three emotional categories.

While the use of physiological signals for emotion recognition is arguably more precise and less prone to ambiguities, it requires the use of hardware in the form of bio signal readers. Such devices add to financial cost and may be inconvenient to the user.

19.3.4 Facial Expressions

One of the most natural methods for emotions to be read is through facial expressions. The need to communicate facial expressions is one of the factors motivating scientists to create telecommunication devices which improve telepresence. Such devices include video conferencing applications and related hardware. Most facial emotion recognition systems work by extracting key features from faces and comparing the extracted features to its database to identify the type of emotion. In 1969, Carl-Herman Hjortsjo created the Facial Action Coding System (FACS) (Ekman and Rosenberg 1997). FACS contains an anatomical catalogue of typical emotion expressed in human faces. Generally, the movements and positions of parts of the face such as the eye brows, lips, jaw, eyes, and head are identified for classification. In a typical computer based emotion recognition system which uses FACS, these features are extracted from the image(s) of a person's face for analysis.

Before being able to extract key features from faces, the system must be able to distinguish, identify and track faces. This can often be a problem especially when there is noise, for e.g. multiple faces behind the user. Various methods have been proposed to solve the problem including the use of colour (Qian and Matthews 2002) and infrared (Eveland et al. 2003).

Facial expression emotion recognition systems in real time video systems need to be more robust than an image based systems because the images in video streams are constantly changing. In other words, a system needs to know when person's face is not showing any emotion and when that state changes. Many current facial emotion recognition systems are now designed to address this problem using various approaches (Bartlett et al. 2006).

In short, a computer based emotion recognition system using facial images in video streams will need to address face identification and tracking, feature extraction, and spontaneous real time video feedback.

Facial expression recognition is a suitable method to use for emotion recognition in a learning management system due to a two reasons. First, extensive research conducted in face expression recognition means that the latest approaches are very mature and have reached an arguably high level of precision. Second, the

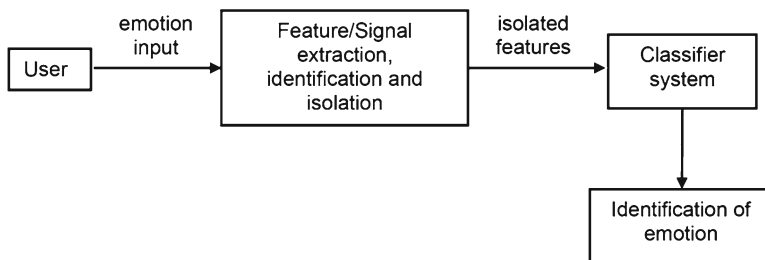


Fig. 19.3 Simplified typical emotion recognition process

method only requires a video camera and no other hardware. As video cameras are often embedded in most laptops, tablets and mobile phones, and affordably available as additional peripheral; the method is easily and readily accessible to students.

19.3.5 *Multimodal Approaches*

Of late, many researchers (Fragopanagos and Taylor 2005) have begun to explore multimodal approaches to emotion recognition. Multimodal approaches generally make use of more than one approach. For example, speech and facial recognition methods could both be employed simultaneously by the system. The advantage of such an approach is that the methods can improve the precision of the identification process by verifying the results produced separately.

Though there are some variations, most of the methods described above adopt the following stages: reading emotion input, feature or signal extraction, identification and isolation, identification of emotion based on a classifier system (Fig. 19.3).

Typically, input from users in the form of either speech, text, biosignals, or face images is obtained from users. Depending on the type of input, the hardware to obtain the information could range from keyboard (text), microphone (speech), biosignal readers such as blood pressure, heart rate, EEG, or blood oxygen readers (biosignals) or cameras (face). Once the information from the user is obtained, specific features need to be extracted, isolated from noise, and identified precisely. The extracted features are then processed using complex algorithms (often employing artificial intelligence approaches) by a classifier system which pinpoints the related emotion with a degree of accuracy. For example, in a typical speech based emotion recognition system, vocal inputs through a microphone is recorded. Noise from the background is removed so that the actual voice can be isolated. This enables the rises in pitch and energy can be identified precisely. The data is sent to the classifier system which compares the pitch and energy to its database and classifies it correctly. For example, boredom is determined by decrease in overall mean of pitch, and slower rate of speech (Murray and Arnott 1993 as cited in Fragopanagos and Taylor 2005).

Early methodologies of emotion recognition systems are often based on static information, for example, capturing and processing an image of a person's face. However, such systems have very little application value as human emotions are spontaneous and change rapidly depending on the stimulus at different points of time. Thus, more robust and dynamic systems which are able to capture streaming input and distinguish expressive and non-expressive states have been designed and proposed recently (Bartlett et al. 2006).

Based on the strengths and weaknesses of previous emotion based elearning systems, an emotion integrated elearning system which can be customised to user emotion is proposed. We recommend a multimodal approach using emoticons and facial recognition methods. The use of emoticons will generally enable us to substantiate and train the classifier of a facial recognition algorithm. The use of emoticons is validated by researchers such as Read (2005) who argued that emoticons are apt training data for other recognition methods.

19.4 Proposed Framework and Discussion

Our proposed emotion integrated online learning system (Fig. 19.4) features two distinct features. First, integration of an emotion recognition engine to extract, classify and predict emotions. Second, customisation of learning materials and pace based on emotion detected by the elearning engine.

In the system, the user provides two types of input to the system, conscious and subconscious. Conscious input includes feedback through mouse and keyboard while subconscious input refers to facial expressions through the use of a video camera. A user's facial expressions are continuously monitored through a video stream which is activated when the user logs on the system. As the user engages in learning, the facial features extracted from video images are extracted and sent to a classifier in the emotion recognition engine which classifies the features into respective emotion states. The emotion state is compared to emoticons selected by users. This is especially important in the initial stages whereby the system can be trained to recognise the correct emotion states. If the system determines that the final emotion state is negative to learning, the system will intervene and prompts the user to either relearn a concept (e.g. return to previous module) or take alternative module(s) (e.g. Module 2.1 in Fig. 19.4). This mimics the role of a teacher, who may stop and ask students if they understand what he/she is teaching, then change strategies, use another approach to explain a concept, or repeat previous information. In other words, the learning process is not necessarily linear, and users can always opt to return to previous modules or an alternative module.

The use of emoticons is to train the system for accuracy in recognising emotion states in user's facial expressions. This means that the system will require two stages of implementation. During the first stage, users will need to select the emoticons which reflect their emotion stage from time to time. The selection by users will be used to train the system to be more precise. When the system has reached a level of

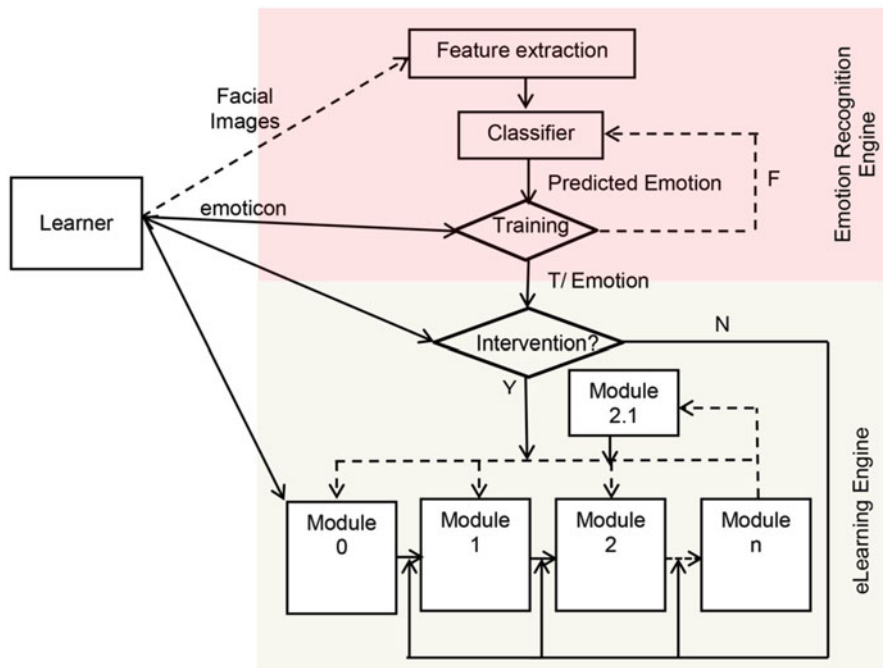


Fig. 19.4 Framework for emotion based eLearning system

accuracy and efficiency in emotion prediction, the emoticons will be removed. This eliminates it as a possible learning distraction and allows the system to work in a more seamless manner.

19.5 Conclusion

To substantiate and justify a proposed emotion based elearning system, the background of emotion, its importance in learning and teaching, and a short synopsis of previous emotion recognition in elearning systems have been detailed. In addition, the strengths and weaknesses of various emotion recognition methodologies were reviewed. The literature shows that emotion recognition is an important natural factor which has largely been ignored by elearning developers over the years. The literature also shows that current research in emotion recognition systems is relatively mature and precise, which supports its application and use in elearning systems. A framework for such a system is proposed and outlined. The design takes into consideration phased implementations for accuracy and efficiency.

The proposed system is not without limitations. First, it is complicated because of the layers of customisation of content to cater to different levels of student

understanding. Second, the development of such a system will require training to gear towards different cultural facial expressions and emotions. Once developed, long term plans for such a system may include the combination of other data such as length of time spent, complexity of content, distance from camera/monitor, response time, etc. with emotion states for health recommendations and considerations. Other future recommendations include a user feedback mechanism to demonstrate empathy, encouragement, and support.

An emotion based elearning system will enable a more effective, useful and natural way of learning and teaching.

References

- Adolphs, R., Damasio, H., Tranel, D., & Damasio, A. R. (1996). Cortical systems for the recognition of emotion in facial expressions. *The Journal of Neuroscience*, *16*(23), 7678–7687.
- Alepis, E., & Virvou, M. (2011). Automatic generation of emotions in tutoring agents for affective e-learning in medical education. *Expert Systems with Applications*, *38*(8), 9840–9847. doi:<http://dx.doi.org/10.1016/j.eswa.2011.02.021>
- Bartlett, M. S., Littlewort, G. C., Frank, M. G., Lainscsek, C., Fasel, I. R., & Movellan, J. R. (2006). Automatic recognition of facial actions in spontaneous expressions. *Journal of Multimedia*, *1*(6), 22–35.
- Barton, J. (1996). Interpreting character emotions for literature comprehension. *Journal of Adolescent & Adult Literacy*, *40*(1), 22.
- Baylor, A. (2000). Beyond butlers: Intelligent agents as mentors. *Journal of Educational Computing Research*, *22*(4), 373–382.
- Ben Ammar, M., Neji, M., Alimi, A. M., & Gouardères, G. (2010). The affective tutoring system. *Expert Systems with Applications*, *37*(4), 3013–3023. doi:<http://dx.doi.org/10.1016/j.eswa.2009.09.031>
- Bovee, C. L., & Thill, J. V. (2010). *Business communication today*. Upper Saddle River: Pearson.
- Buck, R. (2006, March 14–16). *The evolutionary bases of social and moral emotions: Dominance, submission, and true love*. Paper presented at the 9th Sydney symposium of social psychology, Sydney, Australia.
- Busso, C., Deng, Z., Yildirim, S., Bulut, M., Lee, C. M., Kazemzadeh, A., Lee, S., Neumann, U., & Narayanan, S. (2004, November 12–16). *Analysis of emotion recognition using facial expressions, speech and multimodal information*. Paper presented at the Proceedings of the 6th international conference on multimodal interfaces, Istanbul.
- Craig, S., Graesser, A., Sullins, J., & Gholson, B. (2004). Affect and learning: An exploratory look into the role of affect in learning with AutoTutor. *Journal of Educational Media*, *29*(3), 241–250.
- Dow, J. (2014). Aristotle's theory of the emotions: Emotions as pleasures and pains. *Moral Psychology and Human Action in Aristotle*. Retrieved September 5, 2014, from <http://www.oxfordscholarship.com/view/10.1093/acprof:oso/9780199546541.001.0001/acprof-9780199546541-chapter-3>
- Ekman, P., & Rosenberg, E. L. (1997). *What the face reveals: Basic and applied studies of spontaneous expression using the Facial Action Coding System (FACS)*. New York: Oxford University Press.
- Eveland, C. K., Socolinsky, D. A., & Wolff, L. B. (2003). Tracking human faces in infrared video. *Image and Vision Computing*, *21*(7), 579–590.
- Falout, J., Elwood, J., & Hood, M. (2009). Demotivation: Affective states and learning outcomes. *System*, *37*(3), 403–417.
- Fragopanagos, N., & Taylor, J. G. (2005). Emotion recognition in human–computer interaction. *Neural Networks*, *18*(4), 389–405.

- Hancock, J. T., Landrigan, C., & Silver, C. (2007, April 28–May 3). *Expressing emotion in text-based communication*. Paper presented at the Proceedings of the SIGCHI conference on human factors in computing systems, San Jose, California.
- Hwang, K.-A., & Yang, C.-H. (2009). Assessment of affective state in distance learning based on image detection by using fuzzy fusion. *Knowledge-Based Systems*, 22(4), 256–260.
- Jones, A., & Issroff, K. (2005). Learning technologies: Affective and social issues in computer-supported collaborative learning. *Computers & Education*, 44(4), 395–408.
- Kim, K. H., Bang, S., & Kim, S. (2004). Emotion recognition system using short-term monitoring of physiological signals. *Medical and Biological Engineering and Computing*, 42(3), 419–427.
- Kort, B., & Reilly, R. (2002). Theories for deep change in affect-sensitive cognitive machines: A constructivist model. *Educational Technology & Society*, 5(4), 56–63.
- Kort, B., Reilly, R., & Picard, R. W. (2001). *External representation of learning process and domain knowledge: Affective state as a determinate of its structure and function*. In Proceedings of the Artificial Intelligence in Education Workshops *AI-ED* (pp. 64–69), San Antonio, TX.
- Lowendahl, J. M. (2011). *Hype cycle for education, 2011*. Retrieved October 15, 2014, from <https://www.gartner.com/doc/1755718/hype-cycle-education>
- Lowendahl, J. M. (2014). *Hype cycle for education, 2014*. Retrieved September 9, 2014, from <https://www.gartner.com/doc/2806424?ref=ddisp>
- O'Regan, K. (2003). Emotion and e-learning. *Journal of Asynchronous Learning Networks*, 7(3), 78–92.
- Park, J., Barash, V., Fink, C., & Cha, M. (2013, June 8–11). *Emoticon style: Interpreting differences in emoticons across cultures*. Paper presented at the 7th International AAAI conference on weblogs and social media, Ann Arbor, MI.
- Qian, R. J., & Matthews, K. E. (2002). *Method for robust human face tracking in presence of multiple persons*. Google Patents.
- Read, J. (2005, June 27). *Using emoticons to reduce dependency in machine learning techniques for sentiment classification*. Paper presented at the Proceedings of the ACL student research workshop, Ann Arbor, MI.
- Rudman, P., & Zajicek, M. (2006, December 18–22). *Autonomous agent as helper-helpful or annoying?* Paper presented at the IEEE/WIC/ACM International conference on intelligent agent technology, Hong Kong.
- Vogt, T., André, E., & Bee, N. (2008). *EmoVoice—A framework for online recognition of emotions from voice*. Paper presented at the IEEE tutorial and research workshop on *Perception in multimodal dialogue systems* (pp. 188–199). Springer.

Chapter 20

The Use of Motivational Strategies by ESL Teachers in the National Defence University of Malaysia (NDUM)

Emily Abd Rahman

Abstract Motivation has an important role in second language acquisition especially in English-as-a-Second Language (ESL) countries. Disadvantages like insufficient input, lack of opportunities for interaction with English speakers, minimal amount of good English learning role models, and lack of social acceptance in becoming proficient English speakers are significant in most ESL contexts. Thus, it is crucial that teachers instil motivation in the students for successful acquisition of the second language (L2). This research used a mixed method of questionnaire and interview to investigate the use of motivational strategies by 13 National Defence University of Malaysia (NDUM) English instructors in L2 teaching. Results indicate that a number of strategies employed by the instructors improve the students' motivation. However, the incorporation of these motivational strategies depend highly on the availability of time, situation of the class and personality of the instructors.

Keywords ESL • Motivational strategies • NDUM ENGLISH instructors

20.1 Introduction

Motivation has always played a crucial role in the field of foreign/second language (L2) teaching because of its huge contribution towards the students' achievement and attainment in learning the target language (Cheng and Dornyei 2007). Students' motivation functions like an engine that generates learning and also serves as the constant driving force that aids students in enduring the difficult and extensive process of acquiring an L2 (Cheng and Dornyei 2007). Motivation is important because the environment of most English-as-a-Second Language (ESL) countries is always

E.A. Rahman (✉)
Language Centre, National Defence University of Malaysia,
Sungai Besi Camp, 57000 Kuala Lumpur, Malaysia
e-mail: emily@upnm.edu.my

not very conducive for successful L2 acquisition. Drawbacks like insufficient input, lack of opportunities for interaction with English speakers, minimal amount of good English learning role models, and lack of social acceptance in becoming proficient English speakers are significant in most ESL contexts (Rost 2006).

The aforementioned shortcomings are common in the National Defence University of Malaysia (NDUM), Malaysia's only military university that is specially tailored for the needs and development of the Malaysian Armed Forces. Due to these unfavourable settings, a high motivation level is essential for successful L2 acquisition. This huge responsibility of instilling student motivation rests highly on the English language educators in the NDUM. As stated by Rost (2006), a teacher will become happier and more successful when s/he learns to incorporate direct approach to generate student motivation since it is the pulse or life of the class. In this research, the researcher aims to investigate the use of motivational strategies by the NDUM English educators in L2 teaching as student motivation is essential in aiding the students L2 acquisition in this challenging learning context.

20.2 Literature Review

In this section, the importance of motivation in ESL learning and application of the motivational strategies are highlighted to provide a greater understanding of this study. The importance of motivation in language learning was identified since the twentieth century. Researchers, Gardner and Lambert (1959) discovered that the achievement of L2 acquisition is not solely dependent on language aptitude, but is highly enhanced by learner's ability to adopt behaviour patterns of the L2 culture. However, in the NDUM, there is not much opportunity for the learners to be motivated through exposure to English-speaking countries' cultures. They live a very regimented life style and are geared to embrace the military culture as a preparation to join the military after they graduate. In settings with such little resource, which is always the case for ESL contexts, the language teacher becomes one of the best sources of motivation (Burns 2010). The teacher is the means in connecting the students with the target language.

Teachers always employ a range of motivational strategies in the classroom. Some strategies may be implemented from research findings, while some may be derived by the teachers' own experiences (Al-Mahrooqi et al. 2012). The NDUM teachers also use a variety of ways to get the students' interest in class. Previous research on learner autonomy among the NDUM students reveals the various challenges the teachers face in promoting learner autonomy (Emily 2012). The most significant challenge faced by the teachers was the culture of the institution. Students are too engaged in the military trainings. Their first priority is the military training and academic is always second. Since their perceptions of achieving in graduation are different from other universities, hence many different strategies are required to motivate students in L2 acquisition.

This research incorporates Dörnyei and Csizér's (1998) 'Ten commandments for motivating learners' in the pursuit of identifying the motivational strategies incorporated by the NDUM teachers. This criteria was produced based on an empirical investigation of 51 motivational strategies among Hungarian teachers. From the result of the research, the researchers (Dörnyei and Csizér) produced a list of ten most important motivational macrostrategies in language teaching. These ten important macrostrategies were also tested in Asia with 387 Taiwanese English teachers (Cheng and Dörnyei 2007) and later in Oman with 286 English teachers (Al-Mahrooqi et al. 2012). Although the Ten Commandments were originally formulated in a Western country (Hungary), they can also be applied well in Taiwan and in Oman. It is important to note that some strategies are found effective in the Western cultures but are less useful in other cultural settings. Apart from that, this list of motivational strategies is valuable because it actually represents practicing teachers' beliefs and perceptions in a genuine classroom environment, rather than just scientific point of view without empirical evidence (Cheng and Dörnyei 2007). Table 20.1 below is a summary of the ten macrostrategies that are adapted from the previous studies and implemented in the current research. Below each macrostrategy is the smaller set of strategies that represent each of the Ten Commandments.

The current research incorporates all 48 strategies listed above in a questionnaire. The names of the macrostrategies were not included and all the strategies were listed in a random order. The questionnaire was already utilised in the Taiwan and Oman study that were mentioned earlier. This study adapts the same questionnaire but it is used slightly differently compared to the previous two researches. The methods will be explained further under the Methodology section. Based on the 48 strategies, this study has three objectives and three research questions to be answered.

20.2.1 Objective

1. To find out the most important and least important motivational strategies employed by the teachers in the NDUM context.
2. To find out the highest level of usage and the lowest level of usage of the employed motivational strategies by the teachers in the NDUM context.

20.2.2 Research Questions

1. What are the most important and least important motivational strategies employed by the teachers in the NDUM context?
2. What are the highest level of usage and the lowest level of usage of the employed motivational strategies by the teachers in the NDUM context?

Table 20.1 Ten commandments for motivating learners

Ten commandments (Macrostrategies) for motivating learners	
1. Proper teacher behaviour	Show students you care about them
	Show your enthusiasm for teaching
	Establish good rapport with students
	Share with students that you value English as a meaningful experience
	Be yourself in front of students
2. Recognise students' effort	Monitor students' progress and celebrate their victory
	Make sure grades reflect students' effort and hard work
	Promote effort attributions
	Recognise students' effort and achievement
3. Promote learners' self-confidence	Design tasks that are within the students' ability
	Encourage students to try harder
	Make clear to students that communicating meaning effectively is more important than being grammatically correct
	Provide students with positive feedback
	Teach students learning techniques
4. Creating a pleasant classroom climate	Bring in and encourage humour
	Use a short and interesting opening activity to start each class
	Create a supportive classroom climate that promotes risk-taking
	Avoid social comparison
5. Present tasks properly	Give clear instructions by modelling
	Give good reasons to students as to why a particular task is meaningful
6. Increase a learners' goal-orientedness	Encourage students to set learning goals
	Help students develop realistic beliefs about English learning
	Find out students' needs and build them into curriculum
	Display the class goal in a wall chart and review it regularly
7. Make the learning tasks stimulating	Introduce various interesting topics
	Make tasks challenging
	Break the routine by varying the presentation format
	Encourage students to create products
	Make tasks attractive by including novel and fantasy element
	Present various auditory and visual teaching aids
8. Familiarise learners with L2-related values	Familiarise students with the cultural background of the target language
	Invite senior students to share their English learning experiences
	Remind students of the benefits of mastering English

(continued)

Table 20.1 (continued)

Ten commandments (Macrostrategies) for motivating learners
Invite English-speaking foreigners to class
Introduce authentic cultural materials
Encourage students to use English outside the classroom
Increase the amount of English you use in class
9. Promote group cohesiveness and group norms
Allow students to get to know each other
Explain the importance of the class rule
Let students suggest class rules
Ask students to work toward the same goal
Encourage students to share personal experiences and thoughts
10. Promote learner autonomy
Teach self-motivating strategies
Involve students in designing and running the English course
Encourage peer teaching and group presentation
Give students choices in deciding how and when they will be assessed
Adopt the role of a 'facilitator'
Allow students to assess themselves

Using the questionnaire that was created based on the Ten Commandments of the most important motivational strategies in language teaching, I will try to find out the NDUM teachers' perception on motivational strategies, which may be different from the results from the previous two studies because of the difference in settings of the educational environment. Cultural difference may influence the strategies that the teachers deem as important and applicable in their classrooms. The interview acts as a supplementary means in explaining the results of the quantitative data. Since this educational institution is a boutique university, qualitative data is essential to understand the results better. The interviews can avoid generalisation without evidence because assumptions could not explain if the motivational strategies really meets the NDUM students' motivation.

20.3 Method

20.3.1 Sample

The sample consists of 13 English teachers (three males, and ten females) from the Language Centre in the NDUM. Their educational qualifications range from degree to PhD. All of the teachers are Malaysians. Most of them are local graduates. Only a small number of them are overseas graduates. Their working experience at the NDUM is between 1 and 9 years. Out of 13, six teachers volunteered to contribute further in the research by participating in a one-to-one, semi-structured interview with the researcher.

20.3.2 *Research Instruments and Procedures*

The research is a case study that utilises a mixed method of quantitative and qualitative research method. Two research instruments were implemented in this study. The questionnaire was adapted and edited from a study on the use of motivational strategies by English teachers in Oman by Al-Mahrooqi et al. (2012). However, this questionnaire was not created by these researchers as it is actually a modified replication of Cheng and Dornyei's (2007) study on Taiwanese English teachers. In both research, the questionnaire was used in a large-scale empirical survey. It is important to note that my research is different from the two previous researches because the questionnaire is used in a focused group of 13 teachers only. It is a small-scale study and aims to investigate a more in-depth explanation of the topic, thus it has been extended by the incorporation of an interview to get a richer data.

1. Questionnaire

There are three sections in the questionnaire.

- (i) Section A requires participants to rate forty-eight motivational strategies in terms of their importance in the participants' ESL teaching. The rating involves a five-point Likert scale ranging from *Not important*, *Somewhat important*, *Important*, *Very important* to *Vital*.
- (ii) In Section B, the participants are presented with the same list of forty-eight motivational strategies but this time they have to rate them according to how frequently those strategies were used in their ESL teaching. The scale ranges from *Never*, *Rarely*, *Often*, *Very often* to *Always*.
- (iii) The last section covers the participants' demographic information as well as a consent enquiry for further participation in an interview.

2. Semi-structured interview

The semi-structured interview was included in pursuit to clarify any misconceptions while supplementing the quantitative data with additional explanation on the topic.

The researcher collected the data on the 25th of May 2013. The teachers completed the questionnaire in the presence of the researcher to enable them to ask questions or seek for clarifications. After the session, participants who agreed to participate in the interview were then engaged in a one-to-one semi structured interview with the researcher.

20.4 Results and Discussion

Table 20.2 shows the result for the questionnaire. The mean of importance and frequency for each motivational strategy is calculated for comparison. Then, to compare the importance and frequency between the macrostrategies, the mean score of all the strategies under each macrostrategy is added and divided to get the average mean score that represents each macrostrategy.

Table 20.2 Results for questionnaire

Macrostrategies/motivational strategies	Mean	
	Importance	Frequency
1. Proper teacher behaviour	4.108	4.062
(2) Show students you care about them	4.308	4.231
(17) Show your enthusiasm for teaching	4.231	4.077
(23) Establish good rapport with students	4.077	4.077
(40) Share with students that you value English as a meaningful experience	3.769	3.769
(47) Be yourself in front of students	4.154	4.154
2. Recognise students' effort	3.866	3.731
(8) Monitor students' progress and celebrate their victory	3.538	3.462
(15) Make sure grades reflect students' effort and hard work	4.154	4.154
(42) Promote effort attributions	3.462	3.308
(46) Recognise students' effort and achievement	4.308	4.000
3. Promote learners' self-confidence	4.015	3.831
(11) Design tasks that are within the students' ability	4.154	3.769
(28) Encourage students to try harder	4.154	4.000
(33) Make clear to students that communicating meaning effectively is more important than being grammatically correct	3.692	3.769
(34) Provide students with positive feedback	4.231	4.154
(36) Teach students learning techniques	3.846	3.462
4. Creating a pleasant classroom climate	3.769	3.750
(1) Bring in and encourage humour	4.077	3.923
(21) Use a short and interesting opening activity to start each class	3.692	3.769
(30) Create a supportive classroom climate that promotes risk-taking	3.692	3.692
(41) Avoid social comparison	3.615	3.615
5. Present tasks properly	3.808	3.500
(6) Give clear instructions by modelling	3.769	3.385
(25) Give good reasons to students as to why a particular task is meaningful	3.846	3.615
6. Increase a learners' goal-orientedness	3.308	3.097
(10) Encourage students to set learning goals	3.462	3.385
(20) Help students develop realistic beliefs about English learning	3.462	3.385
(26) Find out students' needs and build them into curriculum	3.538	3.308
(31) Display the class goal in a wall chart and review it regularly	2.769	2.308
7. Make the learning tasks stimulating	3.949	3.631
(12) Introduce various interesting topics	4.385	4.154
(13) Make tasks challenging	3.846	3.308
(18) Break the routine by varying the presentation format	4.000	3.769
(27) Encourage students to create products	3.769	3.538
(43) Make tasks attractive by including novel and fantasy element	3.538	3.077
(45) Present various auditory and visual teaching aids	4.154	4.077

(continued)

Table 20.2 (continued)

Macrostrategies/motivational strategies	Mean	
8. Familiarise learners with L2-related values	3.341	3.176
(4) Familiarise students with the cultural background of the target language	3.692	3.538
(7) Invite senior students to share their English learning experiences	2.231	1.923
(9) Remind students of the benefits of mastering English	3.538	3.846
(19) Invite English-speaking foreigners to class	2.231	1.538
(32) Introduce authentic cultural materials	3.385	3.231
(38) Encourage students to use English outside the classroom	4.231	4.231
(39) Increase the amount of English you use in class	4.077	3.923
9. Promote group cohesiveness and group norms	3.708	3.538
(3) Allow students to get to know each other	4.077	4.077
(5) Explain the importance of the class rule	3.846	3.615
(16) Let students suggest class rules	2.846	2.308
(35) Ask students to work toward the same goal	3.692	3.769
(44) Encourage students to share personal experiences and thoughts	4.077	3.923
10. Promote learner autonomy	3.462	3.359
(14) Teach self-motivating strategies	3.538	3.462
(22) Involve students in designing and running the English course	2.846	2.615
(24) Encourage peer teaching and group presentation	3.692	3.923
(29) Give students choices in deciding how and when they will be assessed	3.231	3.231
(37) Adopt the role of a 'facilitator'	4.154	3.769
(48) Allow students to assess themselves	3.308	3.154

The highest mean score for the most important motivational strategy is 4.385. The NDUM teachers think that the most important strategy to motivate the students is by introducing various interesting topics in their lessons (12). The second highest score is 4.308 where teachers think they should show students that they care about them (2) and they should recognise students' effort and achievement (46). The third rank goes to encouraging students to use English outside the classroom (38) with 4.231 mean score.

The highest rank for the most frequently used motivational strategy is showing students that teachers care about them (2) and encouraging students to use English outside of the classroom (38) with mean score 4.231 for both. The second highest mean score is 4.154 with four strategies. The NDUM teachers always be themselves in front of students (47), make sure that grades reflect students' effort and hard work (15), provide students with positive feedback (34), and introduce various interesting topics (12). The third mean score is 4.077 with also four strategies. The strategies are; teachers frequently show their enthusiasm for teaching (17), establish good

Table 20.3 Rank for importance (I) & frequency (F) of macrostrategies

Macrostrategies	Rank I	Rank F
1. Proper teacher behaviour	1	1
2. Recognise students' effort	4	4
3. Promote learners' self-confidence	2	2
4. Creating a pleasant classroom climate	6	3
5. Present tasks properly	5	7
6. Increase a learners' goal-orientedness	10	10
7. Make the learning tasks stimulating	3	5
8. Familiarise learners with L2-related values	9	9
9. Promote group cohesiveness and group norms	7	6
10. Promote learner autonomy	8	8

rapport with students (23), present various auditory and visual teaching aids (45), and allow students to get to know each other (3).

The least important strategies ranked by the teachers are inviting senior students to share their English learning experiences (7) and inviting English-speaking foreigners to class (19), both strategies with mean score 2.231. The second lowest mean score is 2.769. Teachers think that displaying the class goal in a wall chart and reviewing it regularly (31) is not an important strategy in the NDUM context. The third lowest mean score is 2.846 where teachers think that it is not very important for students to suggest class rules (16) and to get involved in designing and running the English course (22).

The least employed motivational strategy is inviting English-speaking foreigners to class (19) with the mean score of 1.538. The second least employed strategy is inviting senior students to share their English learning experiences (7) with the mean 1.923. The third lowest score is 2.308 with two strategies; teachers seldom display the class goal in a wall chart and review it regularly (31) and they also rarely let students suggest class rules (16).

The table below illustrates ranking for the macrostrategies according to their average mean scores. The ranking, number 1 is the most important or frequently used to number 10, the least important or least used macrostrategy.

Form Table 20.3, we can see that most of the ranks are the same for importance and frequency; macrostrategies number 1, 2, 3, 6, 8 and 10. The NDUM teachers think that having proper teacher behaviour is the most important motivational strategy and they also adapt this strategy most frequently, as proven in the ranking for frequency. The least important macrostrategy is increasing learners' goal-orientedness and teachers also seldom use this macrostrategy in class. The interesting part is the unparalleled rankings for macrostrategies number 4, 5 and 7. Teachers claim that creating a pleasant classroom climate is not very important (Rank I: 6) but they frequently employ this strategy in class (Rank F: 3). For macrostrategy 5, teachers think that presenting tasks properly is fairly important (Rank I: 5) but the ranking for frequency shows lesser rating (Rank F: 7). On the other hand,

macrostrategy 7 is the opposite from the other two scenarios. Teachers think that making the learning tasks stimulating is important (Rank I: 3), but it is not reflected as much in the frequency of its incorporation in class (Rank F: 5). In the next section, the results will be explained and discussed further by including the data from the interview.

20.4.1 Macrostrategies Discussed

20.4.1.1 Proper Teacher Behaviour

Demonstrating appropriate teacher behaviour is seen as the most important strategy in motivating the NDUM students. What is more interesting about this macrostrategy is the fact that it ranked first in the other previous studies as well (Al-Mahrooqi et al. 2012; Cheng and Dornyei 2007; Dörnyei and Csizer 1998). This similarity proves that teachers across different cultures believe that being a good role model is the most effective way of motivating students. From the interview, teachers claimed that when they are able to be themselves in the class, they are able to get to know the students better and create a good rapport with them. By acknowledging students as individuals and showing that you care, students tend to feel comfortable and at ease around the teachers. This state of comfort will allow them to learn language easily. Another way to explain this condition by referring to Krashen's (1981) affective filter hypothesis. When students are themselves in class, their affective filter is low so their intake will become higher and they have less anxiety. The NDUM students are reported to be very quiet in class especially when they do not understand the lesson. But when they feel comfortable with the teachers, they will start asking questions and participate in the lessons.

20.4.1.2 Recognise Students' Effort

This macrostrategy is considered fairly important in the NDUM context. Both studies in Taiwan and Oman also reported similar findings where they rank second and third, respectively. All three settings agree that teachers' recognition of students' effort and success can motivate students to strive harder in learning the language. But it is not the same with the Hungarian study. The Hungarian teachers do not think this macrostrategy is important maybe due to cultural difference. The Asia and Arab cultures are closer to the NDUM settings since Malaysia is an Asian, Islamic country. The NDUM students are mostly students with low English proficiency. They are often confused in class but too shy to ask questions. The teachers have to make an effort to check for their understanding by questioning them and using prompts to elicit their linguistic problems during English lessons. Rewarding the students' progress or achievements really help in boosting their confidence in using the language.

20.4.1.3 Promote Learners' Self-confidence

Promoting learners' self-confidence is important in the NDUM as well as the other previous studies. This macrostrategy ranked second in this study, similar to Dörnyei and Csizér (1998) study. In Oman and Taiwan, they ranked third place. The identical results prove that this macrostrategy is considered important across cultures. This macrostrategy focuses on the students rather than the teachers (the first macrostrategy) where both are the most important elements in the teaching and learning process. In the NDUM, the teachers reported that it is vital that teachers provide students with tasks that are suitable with their English proficiency. If the task is too difficult, the students become demotivated and refuse to engage in the task. The students also need to be given ample time to complete a task because of their level of proficiency. Some of the courses are too cramped that it renders students' success in learning. This situation could create a demotivating mood for the students because they think that they are not good enough to master the language. So, students need to be given suitable tasks and ample time in completing a task to promote their self-confidence.

20.4.1.4 Creating a Pleasant Classroom Climate

Classroom setting plays an important role in language learning. A supportive and friendly environment can ease the tension of learning a foreign language. As stated by Young (1999), students' learning motivation is highly influenced by the settings of the classroom where a tense environment will lead to language learning anxiety, which impedes learning. The NDUM teachers do not think that this macrostrategy is important as it ranked number six in the questionnaire. The study in Oman had similar results but those in Taiwan and Hungary had the opposite. However, despite the fact that the NDUM teachers think pleasant classroom climate is not important, they tend to incorporate this macrostrategy a lot in their classroom as it ranked third in the frequency of usage. Without their realisation, the NDUM teachers have been placing a lot of effort trying to get a comfortable, non-threatening environment for the students. Teachers tend to incorporate set inductions that are interesting and tend to use a lot of fun elements in class to make the students feel safe to take risks and participate in class. They try to make the lessons more laid-back rather than very formal because it works incredibly well with the NDUM students.

20.4.1.5 Present Tasks Properly

Clarity in instruction and task presentation is undeniably important as it shapes how students perceive a given task. This macrostrategy is deemed as important in this study as well as the previous ones. As stated by Cheng and Dörnyei (2007), a teachers' capability will not motivate students if his/her teaching is lacking in instructional clarity. However, the NDUM teachers did not implement this strategy as

often, as proved in the ranking for frequency of usage in Table 20.3. Only one teacher highlighted the importance of this strategy in her teaching where she constantly reminds students why a certain task/topic is important in their language learning. By doing so, she reported that her students paid more attention to the topic that was being taught. Others may not have used this strategy because they assume that students are not bothered by it.

20.4.1.6 Increase a Learners' Goal-Orientedness

This macrostrategy is ranked the lowest in this study. The previous study also placed this macrostrategy in the bottom five out of the ten rankings. This result may have been caused by the teachers' uncertainty in the value of this macrostrategy or difficulty in incorporating it into their educational settings (Cheng and Dornyei 2007). As for the NDUM students, most of them are not very concerned with the outcome of their English learning experience. Teachers reported that students are more concerned about their core subjects which they think is far more important than English. So some teachers tried to find what the students need to pass the exam and geared their lesson to be exam-oriented to get the students motivated in the class. So, it is hard to incorporate this macrostrategy in the NDUM context because of the students' mind-set of learning language.

20.4.1.7 Make the Learning Tasks Stimulating

Interest has a vital role in motivating a person to spend considerable amount of energy in doing a certain activity for a long duration of time. In the motivation of L2 learning, interest has also been deemed as a prominent motivational element (Tremblay and Gardner 1995). Nevertheless, this macrostrategy is not considered as important in the previous researches where it ranked fifth in Oman, sixth in Hungary and seventh in Taiwan. In the NDUM, this macrostrategy is ranked as the third most important component. Introducing various interesting topics was ranked as the most important strategy in this study. The NDUM teachers always try to incorporate variety of approaches and teaching aids into their lessons. This method proves to gain students' interest in the topic and get them excited. When they are excited, they will engage in the tasks and pay attention during the lessons. The students enjoy fun activities, so the teachers try to incorporate a lot of songs, videos and presentations into their lesson. They prefer hands-on activities rather than sitting and listening to lectures. However, the ranking for frequency of implementation is low because some of the strategies that are believed by the teachers to be good strategies are not suitable to be used with the NDUM students. For example, the inclusion of literary texts was a failure in the NDUM because students find it irrelevant and taxing.

20.4.1.8 Familiarise Learners with L2-Related Values

This macrostrategy is considered not important in all of the previous and current study. It ranked seventh in the Omani study, eighth in the Taiwanese study, ninth in this study and tenth in the Hungarian study. Although research has claimed that learners' disposition towards the culture and people of the target language can influence success in acquiring the language (Gardner 1985), there seems to be an exception for institutes with different academic objectives. For the NDUM teachers, they are only in favour of encouraging students to use English outside of the classroom because the students are weak in English and they need more practice using the language. Apart from that, teachers are not very keen in familiarising students with the cultural background of the target language. Only one teacher claimed to always share her experiences when she was studying abroad. It can be presumed that the other teachers did not get students familiar with the target language's culture because they have no experience being in an English-speaking country, thus have little understanding or skill in utilising culture to attract students' interest.

20.4.1.9 Promote Group Cohesiveness and Group Norms

Cheng and Dornyei (2007) highlighted the influence of group dynamics where a group collective behaviour is believed to have great impact on its members' action and beliefs. However, this group-related has not been explored or utilised fully in L2 learning (Dornyei and Murphy 2003). This claim is evident in the results of the current and previous studies. In the NDUM, the teachers claimed that group work does not work all the time. Students get off task easily if there were too many members in a group or too much time allocated for a group task. However, one teacher succeeded partly in utilising group dynamics. She incorporated sharing sessions with the students where they were required to take turns to share personal opinions and thoughts at the beginning of each class. This activity got the students motivated in her class and brought the students closer as a group. She once, punished the students by having them stand while listening to her lectures because they were sleepy. Then, in another session, one of her students took the initiative to stand while listening to her lecture because he got sleepy. After that, it became the class' unspoken rule – to stand if you are sleepy.

20.4.1.10 Promote Learner's Autonomy

Learner autonomy refers to having students take charge of their own learning (Holec 1981). This term is becoming increasingly acknowledged in the ESL field. Although learner autonomy is a fundamentally valued educational objective, it is seldom employed in actual teaching practice (Benson 2000). This is evident in the current and previous studies where this macrostrategy is rated as one of the lowest in favour. This means that teachers from cross-cultural settings are still in favour of

teacher-centred approaches. A previous study on the NDUM teachers' perception of learner autonomy also supports this result. From the research, the results indicate that the NDUM teachers are all aware of the importance of promoting learner autonomy but they themselves are not prepared to reflect and change their idea of teaching (Emily 2012). The teachers may take more time to be able to adapt this way of teaching because it is in contradiction of the culture of teaching in Malaysia as well as the military culture in the NDUM.

20.5 Conclusion

As a conclusion, this study has gauged an insight of the NDUM teachers' preference and employment of motivational strategies in their English lessons. Since the NDUM is a military based university, the teachers faced many challenges in motivating the students to learn English due to lack of enthusiasm towards learning language. The teachers put fair effort in incorporating various types of motivational strategies in his/her lessons. Some of the strategies worked well with all the teachers and students, while some did not. There are some strategies that are believed to be as effective, but teachers do not have the time or capability in conducting them. Thus, the incorporation of each strategy depends highly on the situation of the class and the personality of the teacher himself/herself.

The NDUM students, on the other hand, prefer to be acknowledged as individuals in class and engage in fun activities. This could be explained by the fact that they are being treated as a collective group in their military trainings. By acknowledging them as individuals, teachers can make them feel important thus more motivated in learning. Students need to have a friendly, conducive environment to learn language where students can feel safe and unafraid to make language mistakes when they converse using the target language. The lessons should be interesting yet not too complex for students to get the best out of the learning experience as most of them have lower level of English proficiency.

References

- Al-Mahrooqi, R., Abrar-UI-Hassan, S., & Asante, C. C. (2012). Analysing the use of motivational strategies by EFL teachers in Oman. *Malaysian Journal of ELT Research*, 8(1), 36–76.
- Benson, P. (2000). Autonomy as a learners' and teachers' right. In B. Sinclair, I. McGrath, & T. Lamb (Eds.), *Learner autonomy, teacher autonomy: Future directions* (pp. 111–117). London: Longman.
- Burns, S. (2010). How the other half learns. In R. Al-Mahrooqi & V. Tuzlukova (Eds.), *The Omani ELT Symphony: Maintaining linguistic and socio-cultural equilibrium* (pp. 91–110). Muscat: Sultan Qaboos University Academic Publication Board.
- Cheng, H., & Dornyei, Z. (2007). The use of motivational strategies in language instruction: The case of EFL teaching in Taiwan. *Innovation in Language Learning and Teaching*, 1(1), 153–174.

- Dörnyei, Z., & Csizér, K. (1998). Ten Commandments for motivating language learners: Results of an empirical study. *Language Teaching Research*, 2(3), 203–229.
- Dörnyei, Z., & Murphey, T. (2003). *Group dynamics in the language classroom*. Cambridge: Cambridge University Press.
- Emily, A. R. (2012). *The National Defence University of Malaysia teachers' perspectives of learner autonomy*. Unpublished manuscript, The University of Nottingham Malaysia Campus, Malaysia.
- Gardner, R. C. (1985). *Social psychology and second language learning: The role of attitudes and motivation*. London: Edward Arnold.
- Gardner, R. C., & Lambert, W. E. (1959). Motivational variables in second language acquisition. *Canadian Journal of Psychology*, 13, 266–272.
- Holec, H. (1981). *Autonomy in foreign language learning*. Oxford: Pergamon Press.
- Krashen, S. D. (1981). *Second language acquisition and second language learning*. Oxford: Oxford University Press.
- Rost, M. (2006). *Generating student motivation*. [Online] Pearson Education, Inc. Available at: <http://www.longman.com/worldview>. Accessed 25 May 2012.
- Tremblay, P. F., & Gardner, R. C. (1995). Expanding the motivation construct in language learning. *Modern Language Journal*, 79, 505–520.
- Young, D. J. (Ed.). (1999). *Affect in foreign language and second language learning*. Boston: McGraw-Hill.

Chapter 21

Application of Rasch Measurement Model in Evaluating Student Performance for Foundation of Computing II

Raudzatul Fathiyah Mohd Said

Abstract This paper discusses the evaluation of students' performance at the Center of Foundation Studies, UiTM Puncak Alam. There are two programs offered to students at this center; Foundation of Science and Foundation of Engineering. Students who are enrolled in the Foundation of Engineering need to take subjects namely Physics, Mathematics, Chemistry and Computing. For this paper, the Computing subject has been chosen to be evaluated. The course assessment for Computing II (CSC099) includes quizzes (10 %), the midterm exam (20 %), a project (20 %), assignments (10 %) and the final exam (40 %). The students' performance achievement is based on their final examination. Using Rasch Measurement Model, each level of difficulty of questions can be examined based on the students' answers. Each question is mapped to the number of students who are able to answer it correctly. Based on the findings of 75 students, the results show that students can fairly answer questions from different levels of difficulty. The results tabulated from this research may help lecturers to improve the course content in the future.

Keywords C programming • Foundation studies • Rasch model • Students' performance

21.1 Introduction

Measuring students' performance is vital in education as it monitors the learning pattern of the students (Aziz et al. 2013a). Not only it measures what the students have learnt, it also measures the achievement of learning objectives of the subject. Students' performance will indicate how far the learning objective of the subject has

R.F.M. Said (✉)

Center of Foundation Studies, Universiti Teknologi Mara (UiTM), Kampus Puncak Alam, 43200 Puncak Alam, Selangor, Malaysia

e-mail: raudzahfathiyah@puncakalam.uitm.edu.my

been achieved. Thus, lecturers who are teaching the subject may use the performance results to examine the effectiveness of their teaching style.

Center of Foundation Studies, Universiti Teknologi Mara offers two pre-degree programs; Foundation of Science (PI080) and Foundation of Engineering (PI009). Those who are doing Foundation of Engineering need to complete four core subjects, such as Mathematics, Physics, Chemistry and Computing. The completion and results from these subjects are the requirement for them to pursue their degree program locally or overseas. For the Computing subject, students learn the basic C programming language and it covers various topics from data type to strings. The course assessment for the subject consists of tests, quizzes, lab assignment, group project and final examination. Students need to complete tests, quizzes, lab assignment and final examination individually. Only assignment and project will be done in groups.

Students were taught the theoretical and practical basic concepts of C programming language. They were required to write a code of this programming language so that, lecturers could evaluate their understanding of this subject. During lab sessions, students wrote a code by using CodeBlocks software provided by the Center. They could write and test their coding based on what they had learned during the lecture sessions. However, in tests, quizzes and the final examination, students needed to answer all the questions manually, or in short responses without any help from electronic devices. Therefore, the ability of the students were demonstrated by their responses to the questions given.

It is important to employ a suitable assessment tool as to produce quality results. The use of Rasch Measurement Model provides evidence of both validity and reliability of the final examination paper (Ahmad et al. 2010). It uses a students' assessment data and transform it into 'logit' scale, then, transforms the outcome into linear correlation with equal interval (Osman et al. 2013). Later, the results are analysed whether it has been correctly assessed and it will be used as a lecturers' guide in improving their teaching style (Osman et al. 2012).

Students' successes through their understanding of this subject will indirectly contribute towards their performance in the same subject during their degree program. A student who has a strong understanding of this subject normally will have fewer problems in continuing with the advanced level subjects (Osman et al. 2013).

This paper presents the students' understanding in Foundation of Computing II through C programming language. Students' achievement in the final examination are evaluated and measured using Rasch Measurement Model.

21.2 Method

The sample consisted of 75 Foundation of Engineering students from Universiti Teknologi Mara (UiTM). The instrument used was Foundation of Computing II final examination paper which carried 40 % of the total marks for the subject. The final examination paper comprises of various topics in C programming language which was developed according to Bloom's Taxonomy level of mastery. The final

examination consisted of 20 items of C programming language topics. At the end of the semester, the results of the final exam are tabulated. Marks from each student for each question, or referred to as items, are tabled accordingly before running it in the Rasch Measurement Model software, Ministeps.

The reason for choosing Rasch Measurement Model is because the model moves the concept of reliability from creating “best fit line” of the data into constructing reliable measurement instrument. Rasch focuses on constructing the measurement instrument to fit the model and unlike statistical modeling, it creates a model to fit the data (Aziz et al. 2013b). Thus, an appropriate measuring instrument is vital to ensure quality information can be generated for significant use (Ghulman and Mas’odi 2009).

21.3 Results and Discussion

The analysis was carried out to examine the level of achievement of Foundation of Engineering students for the course code CSC099 – Foundation of Computing II. The results from the final examination were tabulated and run in Ministeps, a Rasch Analysis software to obtain the logit values.

Firstly, the analysis on person (student) and item (final exam questions) reliabilities are checked. In order to execute this assessment, an output table of summary statistics is run as is shown in Table 21.1. The result shows that the value of Cronbach- α = .76 which is fair (Fisher 2007). As for the person summary, the outcome is revealed as a fair Reliability = .68. The major finding is the Person Mean $\mu_{\text{person}} = 1.32$ logit, where students were found to be performing well in answering the final examination questions.

The Item summary shows a very high Reliability = .92, which indicates that the items have an excellent range of item difficulties. The item difficulty is spread from 3.22 of maximum for the most difficult to -2.96 of minimum for the easiest question. In other words, positive values indicate that the students’ performance based on the difficulty of the questions is acceptable. The PIDM displays the ability of a person (students) in response to the difficulty of an item (final exam question) (Othmant et. al. 2012). Negative values indicate that the students are having problems in answering the questions.

Further analysis on the validity of the questions was also carried out and the results were examined based on Point Measure Correlation as shown in Table 21.2. All 20 questions have a positive point measure correlation (x) that signifies 50 % of the questions were acceptable except in item Q18 = .35, Q15 = .26, Q10 = .34, Q7 = .30, Q12 = .22, Q1 = .23, Q14 = .35, Q9 = .24, Q3 = .25 and Q4 = .08. It is shown that the correlation value is below the satisfactory range where it should be $.4 < x < .8$. The following check is also required based on Outfit Mean Square (MNSQ) and Outfit z-Standard (ZSTD). If the value of MNSQ is $.5 < y < 1.5$ and ZSTD is $+2 < z < -2$, the result achieved is considered acceptable and the items (final exam questions) are suitable for measuring the students’ performance. In Rasch Measurement Model, the item will be considered as misfit when all three parameter

Table 21.1 Summary statistics

TABLE 3.1 CSC099_RESULT.xlsx ZOU219WS.TXT Sep 12 10:49 2014
 INPUT: 75 Person 20 Item REPORTED: 75 Person 20 Item 2 CATS MINISTEP 3.81.0

SUMMARY OF 75 MEASURED Person

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	13.9	20.0	1.32	.64	1.01	.1	.94	.1
S.D.	5.6	.0	1.27	.18	.24	.7	.53	.7
MAX.	19.0	20.0	3.68	1.11	1.51	2.5	3.76	3.4
MIN.	6.0	20.0	-1.08	.51	.50	-1.1	.11	-1.8

REAL RMSE	.71	TRUE SD	1.05	SEPARATION	1.47	Person RELIABILITY	.68
MODEL RMSE	.67	TRUE SD	1.08	SEPARATION	1.61	Person RELIABILITY	.72
S.E. OF Person MEAN = .15							

Person RAW SCORE-TO-MEASURE CORRELATION = .08

CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .76

SUMMARY OF 20 MEASURED Item

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT		OUTFIT	
					MNSQ	ZSTD	MNSQ	ZSTD
MEAN	52.3	75.0	.00	.34	1.00	.0	.94	.0
S.D.	13.4	.0	1.35	.12	.20	1.4	.32	1.2
MAX.	73.0	75.0	3.22	.73	1.35	2.5	1.65	2.8
MIN.	14.0	75.0	-2.96	.27	.67	-2.4	.49	-1.8

REAL RMSE	.37	TRUE SD	1.30	SEPARATION	3.47	Item RELIABILITY	.92
MODEL RMSE	.36	TRUE SD	1.30	SEPARATION	3.61	Item RELIABILITY	.93
S.E. OF Item MEAN = .31							

Item RAW SCORE-TO-MEASURE CORRELATION = -.97
 1500 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 1301.01
 with d.f. in the range 1406 to 1500, prob.=.9782 to prob.=.9999
 Global Root-Mean-Square Residual (excluding extreme scores): .3763
 Capped Binomial Deviance = .1884 for 1500.0 dichotomous observations
 UMEAN=.0000 USCALE=1.0000

such as Point Measure Correlation, Outfit Mean Square and Outfit z-Standard do not meet the acceptable level. Table 21.2 shows that item Q15 and Q10 are considered misfits since both items do not fulfill all the three control parameters. Q15 has the point measure of $.26 < .4$, MNSQ of $1.59 > 1.5$ and ZSTD of $2.8 > 2$. In item Q10, point measure value score is $.34 < .4$, MNSQ score is $1.65 > 1.5$ and ZSTD score is $2.7 > 2$. Hence, both items need further review.

The determination of person validity also utilised the same method; Point Measure Correlation in which all three parameters such as Point Measure Correlation, MNSQ and ZSTD were applied. The analysis of the person validity is

Table 21.2 Item measure

TABLE 13.1 CSC099_RESULT.x1sx ZOU193WS.TXT Oct 21 17:44 2014
 INPUT: 75 Person 20 Item REPORTED: 75 Person 20 Item 2 CATS MINISTEP 3.81.0

 Person: REAL SEP.: 1.47 REL.: .68 ... Item: REAL SEP.: 3.47 REL.: .92

Item STATISTICS: MEASURE ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.		INFIIT		OUTFIT		PTMEASURE-A		EXACT MATCH		Item
				MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%			
2	14	75	3.22	.33	.80	-1.0	.63	-.9	.56	.42	86.7	83.7	Q2	
18	37	75	1.33	.27	1.22	1.9	1.19	1.1	.35	.49	61.3	70.8	Q18	
13	40	75	1.12	.27	.97	-.2	.88	-.7	.52	.49	73.3	70.1	Q13	
15	42	75	.98	.27	1.29	2.5	1.59	2.8	.26	.48	61.3	70.7	Q15	
17	44	75	.84	.27	.82	-1.7	.68	-1.8	.62	.48	69.3	71.3	Q17	
20	44	75	.84	.27	.85	-1.4	.82	-.9	.58	.48	85.3	71.3	Q20	
10	46	75	.69	.27	1.12	1.0	1.65	2.7	.34	.47	72.0	72.4	Q10	
11	50	75	.39	.28	.81	-1.5	.75	-1.1	.59	.46	82.7	74.7	Q11	
7	51	75	.31	.28	1.24	1.8	1.20	.8	.30	.46	68.0	75.2	Q7	
6	53	75	.15	.29	.93	-.5	.92	-.2	.49	.44	78.7	76.6	Q6	
19	56	75	-.10	.30	.67	-2.4	.58	-1.5	.64	.43	90.7	78.6	Q19	
12	57	75	-.19	.30	1.29	1.8	1.37	1.1	.22	.42	70.7	79.3	Q12	
1	58	75	-.29	.31	1.35	2.0	1.08	.3	.23	.41	70.7	80.0	Q1	
8	58	75	-.29	.31	.76	-1.6	.77	-.6	.55	.41	89.3	80.0	Q8	
14	58	75	-.29	.31	1.14	.9	.95	.0	.35	.41	73.3	80.0	Q14	
5	60	75	-.48	.32	.85	-.8	.74	-.6	.49	.40	89.3	81.6	Q5	
16	63	75	-.81	.34	.79	-1.0	.58	-.9	.51	.36	86.7	84.4	Q16	
9	70	75	-1.93	.49	1.02	.2	.85	.1	.24	.25	93.3	93.4	Q9	
3	72	75	-2.52	.61	.98	.1	.49	-.3	.25	.20	96.0	96.0	Q3	
4	73	75	-2.96	.73	1.09	.4	1.16	.5	.08	.16	97.3	97.4	Q4	
MEAN	52.3	75.0	.00	.34	1.00	.0	.94	.0			79.8	79.4		
S.D.	13.4	.0	1.35	.12	.20	1.4	.32	1.2			11.0	8.1		

shown in Table 21.3. From the given table, two students with entry number S30 and S35 are considered misfits as they could not fulfill all the three parameters. S30 has the point measure of $0.12 < 0.4$, MNSQ of $3.76 > 1.5$ and ZSTD of $3.0 > 2$, and S35 has the point measure of $.00 < 0.4$, MNSQ of $3.03 > 1.5$ and ZSTD of $3.4 > 2$.

In Table 21.4, the scalogram responses show the items (final exam questions) answering pattern of each student. The items are sorted according to the easiest on the left and to the most difficult question on the right of the scalogram. Additionally,

Table 21.3 Person measure

TABLE 1/.1 CSC099_RESULT.xlsx ZOU193WS.TXT Oct 21 17:44 2014
INPUT: 75 Person 20 Item REPORTED: 75 Person 20 Item 2 CATS MINISTEP 3.81.0

Person: REAL SEP.: 1.47 REL.: .68 ... Item: REAL SEP.: 3.47 REL.: .92

Person STATISTICS: MEASURE ORDER

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL			INFIT		OUTFIT		PTMEASURE-A			EXACT MATCH		Person
				S.E.	MNSQ	ZSTD	MNSQ	ZSTD	MNSQ	ZSTD	CORR.	EXP.	OBS%	EXP%		
51	15	20	1.43	.58	1.00	.1	.85	.0	.42	.41	80.0	78.6	S51			
73	15	20	1.43	.58	1.04	.3	.87	.0	.40	.41	80.0	78.6	S73			
12	14	20	1.12	.55	.74	-1.1	.56	-.7	.61	.43	85.0	74.5	S12			
30	14	20	1.12	.55	1.28	1.1	3.76	3.0	.12	.43	65.0	74.5	S30			
32	14	20	1.12	.55	1.39	1.5	2.05	1.6	.12	.43	65.0	74.5	S32			
36	14	20	1.12	.55	1.31	1.3	1.45	.9	.20	.43	75.0	74.5	S36			
40	14	20	1.12	.55	.94	-1.1	.81	-.1	.47	.43	75.0	74.5	S40			
43	14	20	1.12	.55	1.02	.2	.87	.0	.43	.43	75.0	74.5	S43			
45	14	20	1.12	.55	.78	-0.9	.65	-.5	.57	.43	85.0	74.5	S45			
52	14	20	1.12	.55	.96	-1.1	.84	-.1	.46	.43	75.0	74.5	S52			
56	14	20	1.12	.55	1.02	.2	.87	.0	.43	.43	75.0	74.5	S56			
57	14	20	1.12	.55	.78	-0.9	.65	-.5	.57	.43	85.0	74.5	S57			
62	14	20	1.12	.55	.94	-1.1	.81	-.1	.47	.43	75.0	74.5	S62			
65	14	20	1.12	.55	1.02	.2	.87	.0	.43	.43	75.0	74.5	S65			
66	14	20	1.12	.55	.78	-0.9	.65	-.5	.57	.43	85.0	74.5	S66			
16	13	20	.83	.53	.94	-2.2	.78	-.3	.49	.44	65.0	71.6	S16			
17	13	20	.83	.53	1.00	.1	.84	-.2	.46	.44	65.0	71.6	S17			
33	13	20	.83	.53	1.16	.8	1.00	.2	.35	.44	65.0	71.6	S33			
37	13	20	.83	.53	1.42	1.9	1.79	1.4	.14	.44	55.0	71.6	S37			
39	13	20	.83	.53	.91	-0.4	.75	-.4	.51	.44	75.0	71.6	S39			
47	13	20	.83	.53	.98	.0	1.40	.9	.40	.44	85.0	71.6	S47			
61	13	20	.83	.53	.91	-0.4	.75	-.4	.51	.44	75.0	71.6	S61			
75	13	20	.83	.53	1.10	.5	1.24	.6	.35	.44	65.0	71.6	S75			
29	12	20	.56	.51	.99	.0	.88	-1.1	.46	.45	75.0	70.3	S29			
34	12	20	.56	.51	1.06	.4	.94	.0	.42	.45	65.0	70.3	S34			
1	11	20	.30	.51	.90	-0.5	.78	-.4	.53	.46	80.0	69.3	S01			
3	11	20	.30	.51	.86	-0.7	.73	-.6	.56	.46	70.0	69.3	S03			
20	11	20	.30	.51	.90	-0.5	.78	-.4	.53	.46	80.0	69.3	S20			
35	11	20	.30	.51	1.50	2.5	3.03	3.4	.00	.46	60.0	69.3	S35			
13	10	20	.04	.51	1.06	.4	.93	.0	.44	.47	60.0	69.3	S13			
28	10	20	.04	.51	1.26	1.4	1.57	1.3	.26	.47	70.0	69.3	S28			
27	9	20	-0.22	.51	.86	-0.7	.75	-.6	.57	.47	75.0	69.5	S27			

the students are sorted from the best or the most excellent student at the top and the weakest or poor at the bottom of the scalogram. Based on Table 21.3, it is shown that misfit students, S30 and S35, are inconsistent in answering the questions. For example, the easiest item Q4, both students responded wrongly. However, all students were able to answer the question correctly even poor students received full marks on that particular item. For student S06, he has been shown to perform well and managed to answer all easy questions correctly and only answered difficult

Table 21.4 Guttman Scalogram

TABLE 22.1 CSC099_RESULT.xlsx		ZOU219WS.TXT	Sep 12 10:49 2014
INPUT: 75 Person 20 Item		REPORTED: 75 Person 20 Item	2 CATS MINISTEP 3.81.0

GUTTMAN SCALOGRAM OF RESPONSES:			
Person	Item		
Easv	1 111 1112111	43965184296710705382	Difficul

6	+1111111111111111110	S06	
42	+11111111111110111111	S42	
46	+11111111111111110111	S46	
50	+11111111111111111110	S50	
55	+11111111111101111111	S55	
58	+11111111111111101111	S58	
64	+11111111111101111111	S64	
67	+11111111111111011111	S67	
5	+1111111111111101101	S05	
51	+11111101110011111100	S51	
73	+1111111010100111110	S73	
12	+1111111111101001000	S12	
30	+0111110111001011110	S30	
34	+11101111010011100010	S34	
1	+1111110101000100010	S01	
3	+11110101100101001000	S03	
20	+1111110101000100010	S20	
35	+001111010001001110	S35	
13	+1111010001010001100	S13	
28	+10101111010001001100	S28	
27	+1111010100100001000	S27	
60	+11000101100101000000	S60	
24	+10001101100100000000	S24	
26	+11100100100100000000	S26	

	1 111 1112111		
	43965184296710705382		

questions wrongly. Table 21.4 reveals that most students had problems in answering difficult items.

The Person-Item Distribution Map (PIDM) is developed and the output from the analysis is presented in Fig. 21.1. The map details out the exact position of each student in relation to the final exam questions. The PIDM maps out the distribution of Person and Item on the same logit scale with the Latent Trait Theory (Ahmad et al. 2010; Nopiah et al. 2011). The PIDM displays the ability of a person (students) in response to the difficulty of an item (final exam question) (Ibrahim et al. 2012). The level of student’s ability is calculated by the separation of the item against the

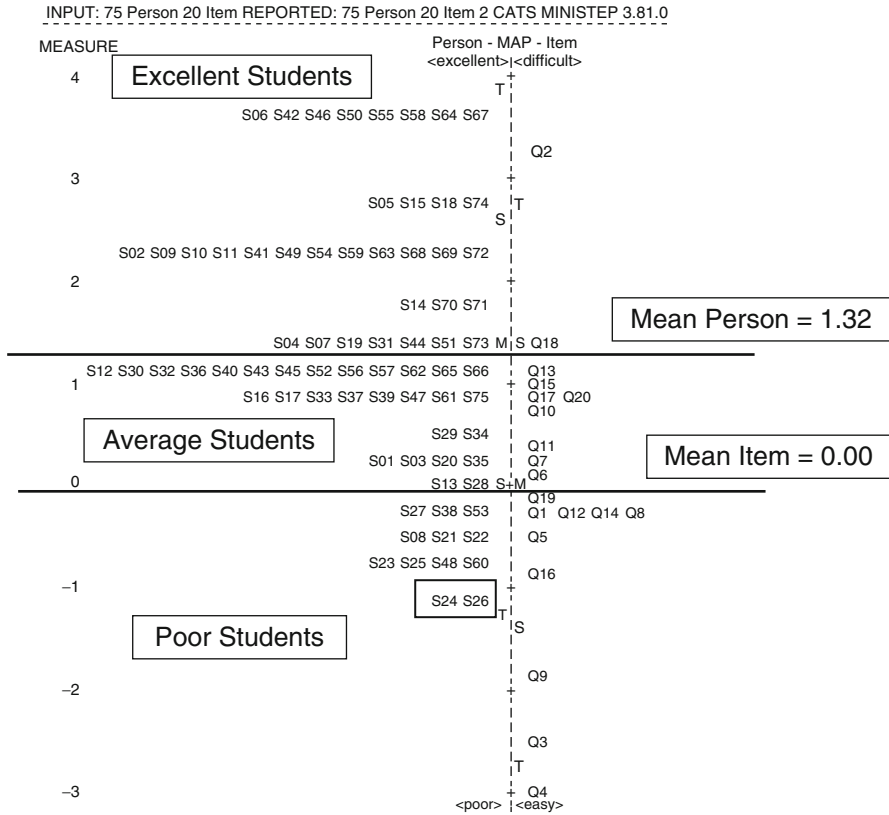


Fig. 21.1 Person-item distribution map

person’s location on the map: the more the separation, the higher a person is likely to respond correctly on the item. In PIDM, Mean item μ_{item} serves as a threshold and it is set to zero on the logit scale (Osman et al. 2013). The difficulty of the items depends on the spread of the items over scale: if an item’s location is far from the Mean item μ_{item} , the more difficult the item is, compared to the item located nearer (Ahmad et al. 2010).

In Fig. 21.1, the Person Mean μ_{person} score is 1.32 which is higher than the threshold value, $\mu_{item} = .00$. It can be seen here that, 61 students (81.3 %) are found to be above the μ_{item} , thus, the overall observation of students’ performance in Foundation of Computing II is better than expected and students have a good understanding and knowledge on the subject. Nevertheless, only 12 students (16.0 %) are located below the μ_{item} and they have difficulty in answering all final exam questions except the items below the μ_{mean} which are easy questions. There are two students (S24 and S26) who were only able to answer the easiest item (Q3, Q4 and Q9) and they can be considered as less excellent students. In conclusion, specific actions or improvement in teachings should be taken to increase the level of success of this subject.

21.4 Conclusion

Using Rasch Measurement Model, it can be concluded that Person and Item constructs are valid and reliable. Also, it shows that Person and Item measures are fit. Therefore, this study proves that students' performance for CSC099-Foundation of Computing II can be measured using Rasch Measurement Model. From the Rasch analysis, students were classified according to their achievement in answering questions ranging from hard to easy levels. It definitely reflects their learning abilities and level of understanding in this subject. The output from this study can be used as a guideline for the lecturers in monitoring students' performance and it is actually a reflector for lecturers in gauging the effectiveness of the teaching and learning for this subject.

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References

- Ahmad, K., Ali, N. M., & Zainudin, S. (2010). An improved course assessment measurement for analyzing learning outcomes performance using Rasch model. *Procedia – Social and Behavioral Sciences*, 18, 442–449. doi:[10.1016/j.sbspro.2011.05.065](https://doi.org/10.1016/j.sbspro.2011.05.065).
- Aziz, A. A., Khatimin, N., Zaharim, A., & Salleh, T. S. A. (2013a). Evaluating multiple choice items in determining quality of test. *Teaching Assessment and Learning for Engineering (TALE)*, 2013, 565–569. doi:[10.1109/TALE.2013.6654501](https://doi.org/10.1109/TALE.2013.6654501).
- Aziz, A. A., Zaharim, A., Fuaad, N. F. A., & Nopiah, Z. M. (2013b). Students' performance on engineering mathematics: Applying Rasch measurement model. *Information Technology Based Higher Education and Training (ITHET)*, 2013, 1–4. doi:[10.1109/ITHET.2013.6671040](https://doi.org/10.1109/ITHET.2013.6671040).
- Fisher, W. P., Jr. (2007). Rating scale instrument quality criteria. *Rasch Measurement Transactions*, 21(1), 1095.
- Ghulman, H. A., & Mas'odi, M. S. (2009). Modern measurement paradigm in engineering education: Easier to read and better analysis using Rasch-based approach. *Engineering Education (ICEED)*, 2009, 1–6. doi:[10.1109/ICEED.2009.5490624](https://doi.org/10.1109/ICEED.2009.5490624).
- Ibrahim, F. M., Aziz, A. A., Zubairi, Y. Z., & Zaharim, A. (2012). Using the Rasch model to assess examination beyond students' scores. *Global Engineering Education Conference (EDUCON)*, 2012, 1–5. doi:[10.1109/EDUCON.2012.6201058](https://doi.org/10.1109/EDUCON.2012.6201058).
- Nopiah, Z. M., Ismail, N. A., Othman, H., Asshaari, I., Razali, N., Osman, M. H., & Jamalluddin, M. H. (2011). Identification of student achievement and academic profile in the Linear Algebra course: An analysis using the Rasch model. *Engineering Education (ICEED)*, 2011, 197–202. doi:[10.1109/ICEED.2011.6235389](https://doi.org/10.1109/ICEED.2011.6235389).
- Osman, S. A., Naam, S. I., Jaafar, O., Wan, B. W. H., & Abdullah, R. A. (2012). Application of Rasch model in measuring students' performance in Civil Engineering Design II Course. *Procedia – Social and Behavioral Sciences*, 56, 59–66. doi:[10.1016/j.sbspro.2012.09.632](https://doi.org/10.1016/j.sbspro.2012.09.632).
- Osman, S. A., Khoiry, M. A., Badaruzzaman, W. H. W., & Mutalib, A. (2013). Measurement of students' understanding in final examination of statics and dynamics course using Rasch measurement model. *Teaching Assessment and Learning for Engineering (TALE)*, 2013, 805–810. doi:[10.1109/TALE.2013.6654549](https://doi.org/10.1109/TALE.2013.6654549).
- Othman, H., Asshari, I., Bahaludin, H., Nopiah, Z. M., & Ismail, N. A. (2012). Application of Rasch measurement model in reliability and quality evaluation of examination paper for Engineering Mathematics courses. *Procedia – Social and Behavioral Sciences*, 60, 163–171. doi:[10.1010/j.sbspro.2012.09.363](https://doi.org/10.1010/j.sbspro.2012.09.363).

Chapter 22

Language and Content (Subject Matter) Challenges Experienced by Accountancy Students in Law Courses

Loo Ern Chen, Nasreen Miza Hilmy Nasrijal, Salmiah Salleh,
and Ekmil Krisnawati Erlen Joni

Abstract In many universities in Malaysia and abroad, various law courses are incorporated into the syllabus for non-law programmes such as accountancy. This paper examines the challenges experienced by accountancy students in a Malaysian university in relation to the English language (which is not the students' first language) as the medium of instruction and content of a company law course. Questionnaire surveys were administered to 215 students who were pursuing or had taken the company law course. In the context of language and content, the findings revealed that more students experienced difficulties understanding the text books and reference materials, rather than understanding lectures and tutorials. There are significant positive correlations between content and language difficulties encountered in relation to the topics covered in the law course. A majority of the students found reading law books boring and preferred courses involving calculations. While students agreed that the lecturers had made the law course easy to understand, they were of the view that simple reading materials and the use of technology could enhance their learning.

Keywords Accountancy students • Content difficulties • Language difficulties • Law courses

L. Ern Chen (✉)

Faculty of Law, Universiti Teknologi MARA Melaka,
Kampus Alor Gajah, KM26, Jalan Lendu, 78000 Alor Gajah, Melaka, Malaysia
e-mail: looern@yahoo.com

N.M.H. Nasrijal • S. Salleh • E.K.E. Joni

Faculty of Law, Universiti Teknologi MARA Melaka,
Kampus Alor Gajah, KM26, Jalan Lendu, 78000 Alor Gajah, Melaka, Malaysia
e-mail: nasreen@bdrmelaka.uitm.edu.my; asalfa568@melaka.uitm.edu.my;
ekmil777@bdrmelaka.uitm.edu.my

22.1 Introduction

Students pursuing the Bachelor of Accountancy degree at tertiary level in Malaysia are required to take law courses such as Business and Company law. The medium of instruction is English, which is not the students' first language. The ability to communicate in English would be essential for one to understand the contents of the law courses. The understanding and interpretation of statutes would involve language and content complexities (Koch and Karlinsky 1984). On the one extreme, the language of any statute can be very explicit; conversely, it may be very ambiguous (Barrick 2001) and complex. Further, language programmes too frequently ignored such diversity of language complexity (Andrews and Pytlik 1983). Law courses are said to be challenging for non-law students. The principal objective of this study is to identify the difficulties that students are experiencing or have experienced in pursuing the law courses. Further, this research also attempts to examine how teaching and learning the law can be improved for non-law students.

22.2 Literature Review

22.2.1 *Company Law Course in the Bachelor of Accountancy Programme*

Accounting profession works closely with company or corporate bodies. Students enrolled in accountancy programme would need to know the law relating to company or other business organisation. One of the courses they have to take is Company Law (CL). The syllabus in the CL course consists of eight major topics: Business Organisation; Incorporation and its effects; Memorandum and Articles of Association; Duties and Qualification of Officers of Company (Directors, Company Secretary and Auditor); Rights and Protection of members of company; Shares, Debentures and Charges; Company Meeting and Winding up of a Company.

22.2.2 *Objectives of Business Law Courses for Accounting Students*

The objective of the law courses is not to turn non-law students into lawyers, but to provide a basic understanding of how the law impacts on business enabling the students to recognise the need to seek further professional legal advice (Allen 2007; Maidin and Sulaiman 2011). In addition, the business environment compels students in every professional track to study the law relevant to that profession (Morris 2010). However, non-law students generally struggle with law subjects, as they feel overwhelmed by the amount of reading required, and that they perceived the law

subject as ‘secondary’ (Allen 2007). Studies in Australian universities revealed that accounting and business students found learning law difficult and challenging (Ewang 2008) as well as daunting and unwelcoming experience (Owens and Wex 2010). Non-law students face challenges in having to understand a complex set of relevant core concepts and doctrine in law, such as case law and doctrine of precedent (Douglas 2012).

22.2.3 Language Skills in Business Law Courses

The company law course in the Bachelor of Accountancy degree programme consist elements which rely on the understanding and interpretation of complex statutes in English. Further, the reference materials are mainly in English. Thus, it is essential that students possess a reasonably high level of English language skills to cope with the language and content complexities of the company law course. Although students do pursue English language courses at the tertiary level, many students may not possess the language competency required to handle law subjects which are specialised and require the ability of reasoning and displaying analytical skills (Maidin and Sulaiman 2011).

Earlier study in Malaysia found that in taxation courses (which involved the understanding of tax statutes enacted in English), students performed better in structured questions which required less language skills (Loo and Ho 2000). Students performed poorly in “essay type” questions which required a reasonably higher level of English language skills despite obtaining adequate grade for English course previously (Loo and Ho 2004). In another study, students’ English language proficiencies were found to have significant correlations with the overall academic performance of accounting students (AlHaddad et al. 2004).

22.2.4 Second Language as Medium of Instruction

Second language learners may find multiple challenges learning in English due to unfamiliar English words and legal terminologies, which include a blend of archaic English, Latin and French. Many non-English words have legally-specific meanings which bear different meaning of the words in common usage (Owens and Wex 2010). Difficulties faced by non-law students in studying law are due to the legal language of the law (Poon and Kong 2014). Where a second language¹ is used as medium of instruction, the complex legal language could be major obstacle for students lacking the ability to understand reference materials in English thereby affecting their morale and performance. Second language students are confronted with further cognitive burden of having to translate and interpret meaning across

¹ In this study, the second language refers to English.

languages (Owens and Wex 2010). Reference materials requiring high level of efforts and language skills to understand would frustrate the students (Adelberg and Razek 1984). Students with limited linguistic competence would selectively ignore certain aspects of the inputs in order to cope with the overwhelming demands of a task. Their focus on the rhetorical aspect of the task caused them the inability to sufficiently understand what they have to learn (Gow et al. 1991).

22.3 Method

Survey method is the main research design for this study. Surveys are appropriate for research questions about self-reported beliefs and behaviours (Neuman 2003). Data were collected through survey questionnaires distributed to 215 students enrolled in the CL course in the March-June 2014 semester. The survey instrument² consists of seven sections. Section 1 solicited students' demographic background. Section 2 and 3 elicited the students' responses on the language difficulties and content (subject matter) difficulties in relation to CL course based on a 5-point Likert scale, from "1" (very difficult to understand) to "5" (very easy to understand). Section 4 required students to rank the relative degree of difficulties in terms of language difficulties and content difficulties among the 10 topics listed based on their learning experiences. Section 5 solicited students' perception on experiences encountered in relation to learning the CL course. Section 6 sought the students' perception on the 10 statements related to the effectiveness of the mode of teaching and learning. For each statement, a 5-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree) was used.

22.4 Results and Discussion

22.4.1 Demographic Profile

The LAW 485 course is one of the compulsory courses offered in an eight semester Bachelor of Accountancy (BACC) programme at UiTM. LAW 485 is offered semester five. Out of the 215 BACC students responded to the questionnaire survey, slightly more than one third of the respondents are in Semester 5 and currently taking the LAW 485 course, being their first attempt in this course. Almost two-third of the respondents had taken and passed LAW 485 previously. Students who had not taken LAW 485 or were away for practical training were excluded from the survey.

² A copy of questionnaire is available upon request.

22.4.2 Language and Content of the Course

Seven aspects tested the students' experience on English as the medium of instructions: the use of the English language in lectures; tutorials; tutorial/assignment questions; quiz questions; test questions; text book and reference materials are examined. Similar seven aspects also examined the content (or subject matter) of LAW 485. Thus, in terms of difficulties that students may have experienced, a total of fourteen variables were examined. The correlations applying 2-tailed Pearson correlation between language and content difficulties in respect of each of the seven variables were also examined.

22.4.3 Language Difficulties³

Based on the mean scores, the students found that the English language as the medium of instruction is neither easy nor difficult to understand. This finding, which is in relation to a course in law is, however, contrary to that of Loo and Ho (2004), who found that accounting students pursuing a taxation course in similar BACC programme encountered difficulties in terms of language complexity of the course. Both law and taxation courses generally cover the elements pertaining to the understanding of the relevant statutes. However, the need to translate the legal language into numeric structure contributed to the language difficulties encountered in a taxation course. Out of seven variables, only 6.1–8.8 % of the students experienced language difficulties when faced with tutorial/assignment, quiz and test questions. More students experienced language difficulties in relation to the text book (26.5 %) and reference materials (27.5 %) when compared with between 4.2 and 5.6 % of them who experienced language difficulties in the lectures and tutorials. Such phenomena could probably be due to the possibility that in the lectures and tutorials, the participants (both lecturers and students) could have reverted to their first language to overcome learning difficulties in the second language. This phenomenon is consistent with the findings of Atkinson (1987).

22.4.4 Content (Subject Matter) Difficulties

More students experienced difficulties in understanding the subject matter in reading materials. It is possible that lecturers are able to elaborate with examples and scenarios for easier understanding during lectures and tutorials. Thus, students

³For the purpose of reporting the findings, the responses for “very difficult to understand” and “difficult to understand” are consolidated and reported as “difficult”. Similarly, the responses for “very easy to understand” and “easy understand” are consolidated and reported as “easy”.

Table 22.1 Difficulties due to content (subject matter)

Difficulties due to content (subject matter)	(1)	(2)	(3)	(4)	(5)	Mean	SD
	VDU	DU	NDE	EU	VEU		
	n (%)	n (%)	n (%)	n (%)	n (%)		
The content (subject matter) of the course explained in the lectures is	0 (0)	5 (2.3)	73 (34.0)	129 (60.0)	8 (3.7)	3.65	.591
The content (subject matter) of the course discussed in the tutorials is	1 (0.5)	11 (5.1)	87 (40.5)	111 (51.6)	5 (2.3)	3.50	.655
The content (subject matter) discussed in the tutorial/assignment questions is	3 (1.4)	11 (5.1)	89 (41.4)	106 (49.3)	6 (2.8)	3.47	.702
The content (subject matter) of the quiz questions is	3 (1.4)	11 (5.1)	92 (42.8)	105 (48.8)	4 (1.9)	3.45	.687
The content (subject matter) of the test questions is	3 (1.4)	21 (9.8)	98 (45.6)	90 (41.9)	3 (1.4)	3.32	.726
The content (subject matter) of the text book is	9 (4.2)	39 (18.1)	117 (54.4)	45 (20.9)	5 (2.3)	2.99	.809
The content (subject matter) of the reference materials is	13 (6.0)	38 (17.7)	116 (54.0)	46 (21.4)	2 (0.9)	2.93	.818

VDU very difficult to understand, *DU* difficult to understand, *NDE* neither difficult nor easy to understand, *EU* easy to understand, *VEU* very easy to understand

experienced less difficulty in understanding the content compared with the content found in the reading materials as students are left to fend for themselves. This can be seen from the evidence that 68.8 % and 44.2 % respectively agreed that the lecturer teaching the law course makes the course easy to understand (Table 22.1).

22.4.4.1 Correlations

Significant and positive correlations [see Table 22.2] were found between language difficulties encountered and content difficulties experienced in relation to the tutorial/assignment questions ($r=0.532$); quiz questions ($r=0.638$) and test questions ($r=0.615$). Similarly, significant positive correlations were also found between language difficulties encountered and content difficulties experienced in relation to text book ($r=0.655$) and reference materials ($r=0.663$). In addition, there were significant positive correlation between the experience in language difficulties and content

Table 22.2 Correlation between “difficulties due to the English languages used” and “content (subject matter)”

	<i>r</i> *
Difficulties due to the English languages used in the lectures and difficulties due to the content (subject matter) explained in the lectures	0.495
Difficulties due to the English languages used in the tutorials and difficulties due to the content (subject matter) discussed in the tutorials	0.598
Difficulties due to the English languages used in the tutorial/assignment questions and difficulties due to the content (subject matter) discussed in the tutorial/assignment questions	0.532
Difficulties due to the English languages used in the quiz questions and difficulties due to the content (subject matter) of the quiz questions	0.638
Difficulties due to the English languages used in the test questions and difficulties due to the content (subject matter) of the test questions	0.615
Difficulties due to the English languages used in the text book and difficulties due to the content (subject matter) of the text book	0.655
Difficulties due to the English languages used in the reference materials and difficulties due to the content (subject matter) in the reference materials	0.663

Pearson Correlation; n=215

*All the correlations are significant at the 0.01 level (2-tailed)

difficulties with respect to tutorials ($r=0.598$) and lectures ($r=0.495$). Thus, generally, students experiencing the degree of language difficulties also found to be similarly encountering difficulties in terms of content.

22.4.5 Topics Covered in the Course

Ten topics covered in LAW 485 were identified for this study, namely, business organisation; classification of companies; company as corporation; constitution of company; officers of company; membership of company; meeting; shares; debentures and winding up. Each of these ten topics was examined in the context of difficulties that students experienced or encountered in terms of language and subject matter, making a total of twenty variables being examined. In terms of language [see Table 22.3], more than one half of the students revealed that they found the topics on business organisation (79.6 %); classification of company (81.4 %) and company as corporation (65.5 %) easy to understand. About one half of the students indicated the following four topics easy to understand, namely, officers of company (45.6 %); membership of company (49.3 %); meeting (50.2 %); and winding up (52.1 %). Meanwhile, 42.8 %; 31.2 % and 31.1 % respectively found the topics on constitution of company; shares and debentures easy to understand, with between 40.0 and 46.5 % found these three topics to be neither difficult nor difficult to understand.

Table 22.3 Language difficulties in relation to topics

Because English language is the medium of instruction, you find the following topics	1	2	3	4	5	Mean	SD
	VDU	DU	NDE	EU	VEU		
	n (%)	n (%)	n (%)	n (%)	n (%)		
Business organization	1 (0.5)	5 (2.3)	38 (17.7)	139 (64.7)	32 (14.9)	3.91	.674
Classification of company	0 (0)	5 (2.3)	35 (16.3)	151 (70.2)	24 (11.2)	3.90	.600
Company as corporation	0 (0)	10 (4.7)	64 (29.8)	128 (59.5)	13 (6.0)	3.67	.661
Constitution of company	3 (1.4)	20 (9.3)	100 (46.5)	84 (39.1)	8 (3.7)	3.34	.757
Officers of company	0 (0)	15 (7.0)	102 (47.4)	88 (40.9)	10 (4.7)	3.43	.693
Membership of company	0 (0)	16 (7.4)	93 (43.3)	99 (46.0)	7 (3.3)	3.45	.681
Meeting	1 (0.5)	28 (13.0)	78 (36.3)	100 (46.5)	8 (3.7)	3.40	.778
Shares	5 (2.3)	57 (26.5)	86 (40.0)	60 (27.9)	7 (3.3)	3.03	.877
Debentures	4 (1.9)	56 (26.0)	88 (40.9)	59 (27.4)	8 (3.7)	3.05	.871
Winding up	3 (1.4)	26 (12.1)	74 (34.4)	100 (46.5)	12 (5.6)	3.43	.828

VDU very difficult to understand, *DU* difficult to understand, *NDE* neither difficult nor easy to understand, *EU* easy to understand, *VEU* very easy to understand

In terms of subject matter, the majority of the students (61.4 %; 76.7 % and 77.2 % respectively) disclosed that they found the topics on company as corporation; business organisation and classification of company easy to understand. Meanwhile, slightly less than one half found topics on constitution of company (42.4 %); meeting (43.2 %); officers of company (43.7 %); membership of company (45.1 %) and winding up (45.6 %) to be easy to understand. However, between 36.3 and 45.6 % of the students indicated that these five topics were neither difficult nor easy to understand. Regarding the degree of difficulties in understanding the subject matter, nearly one third of the students indicated that they found it difficult to understand the topics on shares (31.2 %) and debentures (32.6 %), while 41.4 % and 43.7 % respectively found the two topics to be neither difficult nor easy to understand.

22.4.5.1 Correlations

In terms of both language and content, the topics that most students experienced difficulties to understand were shares (28.8 % for language; 31.2 % for content) and debentures (27.9 % for language; 32.6 % for content). Not more than 6.5 % encountered language and content difficulties in understanding the topics on business organisation, classification of company and company as corporation, while between 7.0 % and 18.2 % experienced language difficulties in understanding the remaining

Table 22.4 Correlation between “difficulties because English languages is the medium of instruction” and “difficulties because of the content (subject matter)” in relation to Topics

	<i>r</i> *
Business organization	0.599
Classification of company	0.682
Company as corporation	0.656
Constitution of company	0.710
Officers of company	0.629
Membership of company	0.641
Meeting	0.716
Shares	0.715
Debentures	0.744
Winding Up	0.638

Pearson Correlation; n=215
 *All the correlations are significant at the 0.01 level (2-tailed)

topics, namely: constitution of company; officers of company; membership of company’ meeting and winding up.

Significant positive correlations [see Table 22.4] were also found between the degree of difficulties experienced in terms of language and in terms of subject matter in relation to topics on debentures ($r=0.744$); meeting ($r=0.716$); shares ($r=0.715$) and constitution of company ($r=0.710$). Strong positive correlations are found between the degree of difficulties experienced in terms of language and subject matter for the following topics: classification of company ($r=0.682$); company as corporation ($r=0.656$); membership of company ($r=0.641$); winding up ($r=0.638$); officers of company ($r=0.629$) and business organisation ($r=0.599$).

22.4.6 Ranking of Difficulty

For the ten topics examined, the respondents were requested to rank the relative degree of difficulty experienced in terms of language and in terms of content (subject matter). The ranking is on the scale of 1–10, where 1=easiest; while 10=most difficult.⁴

Nearly nine-tenth of students ranked topics on business organisation and classification of company as easy. The topics that most students ranked as difficult were: winding up (62.8 %); shares (76.7 %) and debentures (81.4 %). The majority of the students ranked the remaining topics as moderate, namely meeting (70.2 %); constitution of company (73.0 %); officers of company (76.7 %) and membership of company (81.4 %). In relation to the content, about nine-tenth of the students ranked business organisation and classification of company as easy. The three topics that

⁴For the purpose of this study, the ranking is re-defined, whereby the ranking of 1, 2 and 3 are collectively defined as “easy”; the ranking of 4, 5, 6 and 7 are defined as “moderate” while, the ranking of 8, 9 and 10 are defined ad “difficult”.

are ranked as difficult by the majority of the students were winding up (60.9 %); shares (74.0 %) and debentures (82.3 %). Topics on meeting, constitution of company, membership of company and officers of company were found to be moderate.

22.4.7 *Cross Tabulations*⁵

Analysis, based on cross-tabulation, would reveal another dimension on the association of the students' ranking between difficulties in relation to language as the medium of instruction and difficulties in relation to content. With regard to difficulties encountered in terms of English language as the medium of instruction and the content (subject matter), students ranked topics on company as corporation (67.4 %); business organisation (83.7 %) and classification of company (87.4 %) as easy. Thus, in the context of both language and content, more than two-thirds ranked these three topics as easy as relatively compared to the other seven topics.

Most students ranked winding up, shares and debentures as topics that they encountered difficulties in terms of the language and the content. In relation to the language and the content difficulties, relative to the six other topics, about six-tenth of the students ranked the following four topics as moderate: meeting (59.1 %); constitution of company (69.3 %); officers of company (70.7 %) and membership of company (72.1 %).

22.4.8 *Experience Encountered*⁶

In relation to the experience that the students had encountered in the course of taking LAW 485, eight variables were examined. 42.4 % of the students revealed that they do not like courses that involved a lot of reading. Conversely, 68.4 % of them prefer courses which involve calculations. Meanwhile, 48.9 % found law books boring to read and 55.8 % do not have enough time to read the materials for the law course. Some students commented that lecturers should provide supporting and simplified reading material for easy reading.⁷

With 78.6 % of the students found it difficult to memorize cases in the law courses, there were suggestions that lecturers should identify a list of cases for students to memorise. In addition, 53.5 % of them found difficulties in understanding

⁵For cross tabulation analysis, the rankings are also similarly re-defined into "easy"; "moderate" and "difficult".

⁶For the purpose of reporting the findings, the responses for "strongly agreed" and "agreed" are consolidated and reported as "agreed". Similarly, the responses for "strongly disagreed" and "disagreed" are consolidated and reported as "disagreed".

⁷These and other comments reported are those made by the students in the questionnaires.

the statutory provisions (sections in the Act) and 88.4 % of the students felt that there were too many statutory provisions (sections in the Act) to remember. A majority of 52.1 % of the students found learning the law courses to be interesting. In fact, some students suggested that law should remain as a course in accounting programme because it helps students in their study of other courses, particularly company secretarial practices course. While some students felt that law is important for an accountant, others felt that accounting students are not equipped to learn law. In the context of experience in taking test/examination, 41.4 % of the students revealed that they were not sure of how to answer test/examination questions for the law courses. Some students suggested that lecturers should provide easy to understand model answers to help students in their performance in the final examination.

22.4.9 Effective Mode of Teaching and Learning

The ten variables pertaining to the effective mode of teaching and learning being examined can be categorised into teaching, learning, reading materials and use of technology. With regard to teaching mode, slightly more than two-third of the students agreed that the lecturer teaching the law course makes the course easy to understand. Only about one-third of them agreed that the lecturer usually asked the students to read the books on their own. In addition, 44.2 % of the students agreed that lecturer teaching the law courses uses teaching tools that enhanced students' understanding of the law.

In relation to the learning mode, about seven-tenth of the students revealed that they can memorise songs better than memorise cases. Only two-tenth of the students agreed that most of the time they do not understand the lecture delivered by the law lecturer. On the issue of reading materials (books, manual, notes), a majority of the students agreed that these materials should look interesting (77.2 %) and that these reading materials should be made simple to understand (84.6 %).

On the use of technology, 60.9 % of students agreed that using technology will help them understand the law better. Meanwhile, 70.7 % of students agreed that it would help them in their studies if guidelines on answering law questions are easily accessible through modern technology, and 82.8 % of them agreed that having notes on the law cause easily accessible through modern technology would help students to learn the law.

22.5 Conclusion, Limitations and Further Research

In sum, difficulties in understanding the text book and reference materials were experienced by the highest number of students. Students also found selective topics difficult to understand, mainly the topic on debentures and shares while topics on

business organisation classification of company and company as corporations were found to be easy to understand. The students ranked the topic on shares, debentures and winding up as the three most difficult topics to understand, both in terms of language as well as content. It is acknowledged that the limitation of survey questionnaire with its self-reported behaviour may be less reliable than observed behaviour. However, this limitation has been minimised as the authors also carried out informal observation on the students' learning of the law course.

Recognising some of the difficulties encountered by students and in an effort to enhance the effectiveness of teaching and learning the CL courses, especially when English, (which is not the students' first language), is the medium of teaching and learning, the writers had developed a teaching aid kit to supplement the traditional face-to-face lectures/tutorials. A teaching aid kit is proposed to be put into operation for the next cohort of CL students. The effectiveness of the proposed usage of the teaching aid kit would be the subject of future research.

References

- Adelberg, A. H., & Razeq, J. R. (1984). The cloze procedure: A methodology for determining the understanding of accounting textbooks. *The Accounting Review*, *LIX*(1), 109–122.
- AlHaddad, S. K., Mohamed, M., & AlHabshi, S. M. (2004). An exploratory study on English language proficiency and academic performance in the context of globalization of accounting education. *National Accounting Research Journal*, *2*(1), 55–71.
- Allen, V. (2007). *A critical reflection on the methodology of teaching law to non-law students* [online]. London: Kingston University Research Repository. Available at <http://eprints.kingston.ac.uk/archive/00002125>
- Andrews, J. D., & Pytlik, B. P. (1983). Revision technique for accountants: Means for more effective and efficient written communication. *Issues in Accounting Education*, *LIX*(1), 109–122.
- Atkinson, D. (1987). The mother tongue in the classroom: A neglected resources? *ELT Journal*, *41*(4), 241–247.
- Barrick, J. A. (2001). The effect of code section knowledge on tax-research performance. *The Journal of the American Taxation Association*, *23*(2), 20–34.
- Douglas, S. (2012). Student engagement, problem learning and teaching law to Business students. *e-Journal of Business Education & Scholarship of Teaching*, *6*(1), 33–47. <http://www.ejbest.org>
- Ewang, F. (2008). Teaching law to accounting and business students: A cumulative dual model. *Journal of University Teaching & Learning Practices*, *5*(2). Available at: <http://ro.uow.edu.au/jutlp/vol5/iss2/3>
- Gow, L., Kember, D., & Chow, R. (1991). The effects of English language ability on approaches to learning. *Regional English Language Centre Journal*, *22*(1), 49–68.
- Koch, B. S., & Karlinsky, S. S. (1984). The effect of Federal Income Tax Law Reading Complexity on students' task performance. *Issues in Accounting Education*, *1*, 98–109.
- Loo, E. C., & Ho, J. K. (2000, November 21–23). *Taxonomy of tax educational objectives: An evaluation of examination, assessment and performance*. Paper presented at the international conference on technical & vocational education, Petaling Jaya.
- Loo, E. C., & Ho, J. K. (2004). Language and content complexities encountered by students in taxation courses. *National Accounting Research Journal*, *2*(1), 73–87.
- Maidin, A. J., & Sulaiman, S. S. (2011). Importance of legal education for quantity surveying professionals: A proposal for developing a legal studies module for Malaysian system. *Journal of Applied Science Research*, *7*(13), 2249–2256.

- Morris, R. J. (2010). The teaching of law to non-lawyers. An exploration of some curriculum design challenges. *International Journal of Law in the Built Environment*, 2(3), 232–245.
- Neuman, W. L. (2003). *Social research methods, qualitative and quantitative approaches* (5th ed.). Boston: Pearson Education.
- Owens, A., & Wex, I. (2010). What are the challenges involved and the strategies employed in teaching Australian law to non-law students from non-English speaking backgrounds and cultures? *Journal of the Australian Law Teachers Association*, 10(1), 89–98.
- Poon, J. K. L., & Kong, M. M. C. (2014). Perception of non-law students on the combined lecture- and problem-based learning approaches. *Open Journal of Social Science*, 2, 45–50. <http://dx.doi.org/10.4236/jss.2014.25010>

Chapter 23

Transfer of Training and Its Relationship with Reasons for Participation and Realization Factors – A Study of ICT Training Among Teachers of a Public Secondary School in Malaysia

Muhamad Khalil Omar, Azzarina Zakaria, and Badrul Azmier Mohamed

Abstract In this technological era, computers are used to solve various problems. One use of Information Communication Technology (ICT) in Teaching and Learning (T & L) is through the use of computers. It was observed that an increasing number of schools in Malaysia are now undertaking training to develop skills in the use of ICT in teaching and other school activities, including classroom management. Therefore, to ensure that teachers bring their skills to actual classroom teaching, transfer of training among teachers who attended the ICT training program is very important as they need to transfer the learned knowledge to their students. Hence, this study is aimed to determine the effects of the reasons for ICT training participation and factors obstructing realization of ICT training towards the transfer of training among teachers. Based on eighty teachers surveyed in a public secondary school of Malaysia found that both reasons for participation and realization factors were significantly related with transfer of training among teachers who had attended ICT training. This study therefore indicates that careful considerations should be taken in ensuring interference issues being handled properly in designing ICT training among teachers so that transfer of training be achieved successfully.

M.K. Omar (✉)

Faculty of Business Management, Universiti Teknologi MARA,
42300 Puncak Alam, Selangor, Malaysia
e-mail: khalil.omar@salam.uitm.edu.my

A. Zakaria

Arshad Ayub Graduate School of Business, Universiti Teknologi MARA,
Shah Alam, Selangor 40450, Malaysia
e-mail: azzarina@salam.uitm.edu.my

B.A. Mohamed

Faculty of Administrative Science & Policy Studies, University Teknologi MARA,
Seremban 3, 70300 Seremban, Negeri Sembilan, Malaysia
e-mail: badmohamed@ns.uitm.edu.my

Keywords Information technology • School • Teachers • Training • Transfer of training

23.1 Introduction

Nowadays the Information Communication Technology (ICT) is very important to everyone. In the globalization environment and knowledge-based society, the intellectual individual is an emblem and symbol of society (Wang 2013). In this technological era, computers are used to solve various problems. One use of ICT in Teaching and Learning (T & L) is through the use of computers. In Malaysia, the knowledge and use of computers in schools is growing. Therefore, the transfer of training for teachers who attended the ICT training program is very important so that they can transfer the learned knowledge to their student. At the same time the association between the reasons of participation for teachers attending the ICT training program will influenced the transfer of training. On other hand, factors that obstructing the ICT training programme to be realized shall also affect the transfer of training for teachers in school.

On 2013, Malaysia's Ministry of Education had improved and changed the vision towards sustaining quality education system in order to develop individual potential to fulfil national aspirations. So that, the ministry wants to transform the education style by using ICT in all primary and secondary schools in Malaysia. Therefore a new role for schools and teachers emerges, namely as far as building of learning environments is concerned – where the ICT constitutes an integrand meaningful part. In addition, these learning environments are favourable to the development of meaningful learning to the teachers, when they are part of challenges that only the teacher can face. Hence, teachers need to equip themselves with knowledge-based information and communication technology for the use of ICT in teaching and learning process in schools.

Most of schools in Malaysia are equipped with all ICT infrastructure facilities such as projectors facilities, internet access as well as a computer lab, and the teachers are also provided with their own laptop. It was also observed that an increasing number of schools in Malaysia are now undertaking training to develop skills in the use of ICT in teaching and other school activities, including classroom management, to ensure that teachers bring their skills to actual classroom teaching. For example, South Korea's teacher training objectives are all directed towards developing the skills of teachers to use ICT in teaching Korean, English, Social Studies, Science, Ethics, Mathematics, Music, Art, Gymnastics, and Economics. In some country like Singapore has offered their teachers to attend higher level teaching pedagogy ICT training program. While some of the Intel-funded countries have started their training programmes by integrating subjects in schools with ICT-based lesson.

The differences in training objectives or thrusts are not only found between countries but also within a country itself. The original training strategy gets watered down due to the huge numbers of teachers to be trained and lack of time and

resources. Only in very few programmes ones finds training objectives that go beyond developing teacher competencies in the use of ICT, into ICT management and technical support, including troubleshooting. In addition, in mid – 2013 teachers are given a brief use of Frog i.e. Virtual Learning Environment (VLE). Frog is a web-based learning system that simulates real world learning by integrating the concept of conventional education with virtual methods. For example, teachers can give assignments, tests and virtual assignments, while students can submit assignments and check marks through the VLE. Parents can communicate with the school and school administrators can manage the school calendar and school notices expose via the Internet. This means teachers need more training in ICT to interact with students in cyberspace.

Therefore, this study's research questions are what the factors of transfer of learning among teachers attending ICT are training and how the transfer of training is influenced by their reasons of joining such training. At the same this research's objectives are to examine the reason of teachers participate in ICT training program and the impact of realization factors that make an ICT training difficult to implement such as lack of financial resources, lack of infrastructure in school and so on.

23.2 Literature Review

ICT would appear to offer individuals and organizations faster, cheaper, broader sources of data and enable information exchange as well as capturing, generating, sharing and storage of knowledge (Walsham 2001). At the same time, some of researchers said that the availability of a range of new technologies and tools has been a major catalyst to knowledge management initiatives (Shokri-Ghasabeh and Chileshe 2013). In addition ICT tools such as e-mail, video-conferencing and virtual teaching and learning provide a valuable learning support (Alavi et al. 2005).

23.2.1 Transfer of Training

Transfer of training and transfer of learning are two sides of the same things. The only differences of both are one perspective may be from the classroom teacher who is preparing students to advance to the next grade level or to an advanced course; the other perspective may be from the trainer who is preparing employees to enhance their job performance and employment. Both perspectives are legitimate. Both perspectives are of paramount concern for classroom instructors or trainers. The definition of training transfer generally refers to the use of trained knowledge and skill back on the job. For transfer to occur "...learned behaviour must be generalized to the job context and maintained over a period of time on the job" (Baldwin and Ford 1988, p. 63). Transfer of learning occurs when trainees apply the knowledge, skills, behaviours and attitudes they gained in training and continually practice of them over a period of time to their jobs (Baldwin and Ford 1988).

Based on Baldwin and Ford Model of Training Transfer, there are three factors that affect the effectiveness of transfer training i.e. trainees' characteristics, workplace environment and instructional design. Additionally teachers' use of ICT may be influenced by the learning environment in terms of infrastructure, classroom structure, grouping, learning tasks, interaction patterns, behavioural control, mental effort, interaction, time schedule, teaching and learning methods, etc. The nature of this influence is to a large part determined by the teachers themselves. The skills of teachers that mostly influenced their uses of computers are those skills that are related to their competence in classroom management activities, to their pedagogical skills and, less importantly, to their computer-handling technical skills. Fear is often cited among teachers as a reason for resisting the use of computers in the classroom i.e. fear of losing control of 'centre stage', or fear of 'looking stupid' in front of the class. A teacher's adjustment to the use of technology requires considerable effort, new knowledge, and a willingness to change existing teaching strategies.

According to Cheng and Ho (2001), there were many researches that had study the effects of individuals' factors (such as trainees' ability, personality, and motivation) towards their productivity and costs. The measures to improve efficiency have been wide-ranging and factors influencing the implementation of training and learning in the workplace are new technology, work re-organization, training opportunities, performance appraisal, performance-based pay, temporal flexibility and broad banding. Many of these changes have required training in themselves and this was sometimes reflected in enterprise agreements; more often, the agreements included a training provision, such as a commitment to training or to the establishment of a training program, consultation on training or training leave.

23.2.2 Reasons for Training Participation

There are many kind of reason that resulted teachers to participate in the training program such as to improve their knowledge, skill, ability and others characteristics. According to the past research, the reasons for participation to a training program is not limited to a specific program, but it extends to the long run continuing development through which teachers have to be lifelong learners in a collective and collaborative way and at the same time continuing education and lifelong learning should be a necessary priority for the educational process (Ullman 2014). In addition, there were several reasons why teachers participate in training program, i.e. to completes his/her initial education and then upgrades his/her skills in such a way that he/she becomes effective at his/her educational work within a school in where expectations of competence in project management requiring extra specialization (Becker et al. 2014). Therefore, in-service training can be characterized as an answer to the changes that occur in people's lives and it assists in their adjustment to new conditions.

In the training context, according to researchers generally conclude that the expectation of gaining valued benefits from training is a key antecedent of training

participation (Salas et al. 1999). At the same time, the study by Ardies et al. (2014) found that attitudes towards development are positively related to intention to participate. Kyndt and Baert (2013) suggested that employee participation in development activities is positively related to whether they perceive any personal, job-related, or career-related benefits from participating in such activities. Recent empirical evidence indicates that the perceived benefits are positively related to motivation to participate in training (Kang 2007). At the same time, from the participation in ICT training program it will develop the knowledge, skill, ability and others characteristic. Researcher said that ICT skills are considered to be a means of professional development and an answer to society's requirements (Vosniadou 2007).

It is undeniable that teachers are lack of knowledge, skill, ability and others characteristic to using the ICT. In a study of teachers' views with regard to their use of ICT in educational practice in Ireland, Walsham (2001) found that teachers felt more motivated and effective in their work as a direct result of using ICT. Several people argue that training programs that concentrate on ICT pedagogical training instead of technical issues and effective technical support, help teachers apply technologies in teaching and learning. Researchers have also revealed that quality professional training program helps teachers implement technology and transform their teaching practices (Brinkerhoff 2006). Teachers are the people who have great intelligence and good control on student in school. At the same time, teachers' understanding of content knowledge and how to apply technology to support students' learning and attainment are needed to increase their knowledge level, confidence and attitudes towards technology. Educators who integrate technology with new teaching practices gained through professional training can transform the performance of the students (Lawless and Pellegrino 2007). According to Cheng and Ho (2001), professional training courses must be designed to identify beliefs about successful teaching, policies for enhanced teaching and learning as well as syllabus design for teaching purposes.

23.2.3 Difficulty Factors in Training Realization

In order to foster the implementation of ICT in school, several preconditions have to be met. These may to a substantial part be influenced by the policy towards ICT which is adopted at the community (i.e. the national, regional, or local) level. Among these preconditions are giving financial support to schools, fostering courseware development, fostering adequate teacher training, providing technical and pedagogical support, and stimulating the use of ICT by integrating ICT related abilities in the curriculum and examination requirements.

Salas et al. (1999) indicates that the human resource practices which operate in particular workplaces provide an important context within which training operates; and that any effect of training is likely to be mediated by those practices. It is concluded that increase levels of training may be ineffective without a surrounding context of flexible human resource strategies. If so, then the absence of information

about work practices in many studies of the incidence and outcomes of training is a significant limitation. There is some question about the appropriateness of certain flexible workplace strategies for smaller firms.

At the same time, Kelpanidis and Vrynioti (2004) proposed three main purposes that enterprises might espouse as desired outcomes of training effort. They found a relationship between these training purposes and the broader organizational strategies adopted by an enterprise. The organizational strategies noted that are most conducive to high levels of training investment, if the cost benefit approach sees training as a cost to be minimized. The most common training purpose was a focus on individual development, however a third of company executive managers favouring the cost benefit approach. In practice, those favouring a cost benefit approach were more interested in saving money instead of training.

On the other hand, there were many studies that show planning and management of ICT projects has a very poor record in developing countries (Heeks 2002). However, a careful review of reasons for failure identifies other factors whose presence or absence determines success or failure of projects. The researcher identifies that the output variables which are the benefits are to be achieved if the initiative succeeds. Therefore, there were several difficulty factors or failure reasons in realizing an ICT training program. These can either be barriers or inhibitors as described by (Oreglia 2014; Yusri and Goodwin 2013). Barriers can be considered as those occurrences that hinder ICT implementation. Some of these difficulty factors for realization failure are infrastructure, finance, poor data systems, lack of compatibility, skilled personnel, leadership styles, culture, bureaucracy and attitudes.

23.3 Research Framework

The research is wanted to know more about the main factors that leads to teachers' transfer of training. The entire factors are suggested with a lot of literature that can give support about the factors. The conceptual framework of this research is shown in Fig. 23.1.

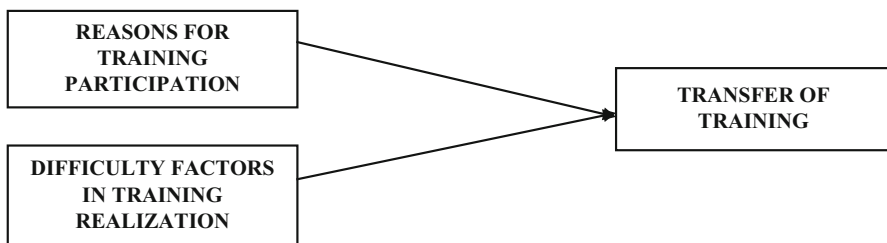


Fig. 23.1 Research framework

23.4 Method

The type of the research is descriptive research. This is because this research is conducted to discover and determines the characteristics of phenomenon. This type of research is conducted as accurately as possible because, unlike the exploratory research, the evidence it provides will be used to determine a course of action. Variables that been gathered are independent and dependent variable. By using this method, the researchers are able to answers the questions about asking about the existing phenomenon among variables. In addition, to know how two or more or mire things are related to one another.

The researcher has decided to use convenience sampling technique for this study. Convenience sampling is a type of non-probability sampling design, which attempts to obtain a sample of convenient elements. The selection of sampling units is left primarily to the interviewer. Often, respondents are selected because they happen to be in the right place at the right time. According to Malhotra (2004), this type of sampling is the least expensive and least time consuming of all sampling techniques. The sampling units are accessible, easy to measure and cooperative. Total of 80 samples are be selected from this study and data was collected during June 16th to June 18th of 2014 in a secondary public school in Malaysia.

The instrumentation that will be used in this research is going to be questionnaire. The set of questionnaire was constructed to meet all the aspects that the researcher is trying to investigate i.e. transfer of training that was associated with the reasons of teachers participating in the ICT training and the difficulty factors of in realizing the ICT training. In total, the questionnaire comprises 120 questions. The questionnaire also included demographic questions that addressed age, gender, job rank and type of occupation. Responses were taken on a 5 point Likert scale (1=Strongly Disagree to 5=Strongly Agree).

23.5 Results and Discussion

Majority of respondents were female (94 %), age between 40 and 50 years old (41 %), married (84 %), working as science and mathematics teacher (30 %) and having working experience around 11 to 10 years (38 %). Means analysis for each of study variables i.e. reasons for participation, difficulty for training realization and transfer of training are shown in the following Tables 23.1, 23.2 and 23.3.

Based on Table 23.1, it was found that the surveyed teachers in that secondary school mostly agree that they came for ICT training because to prepare for their teaching. Another reasons that quite important are due to use ICT in personal life as well to give them chance to communicate and make acquaintance among other trainees. Interestingly the teachers in average were neutral in terms of their reasons for participating ICT training due to getting the certificate in order to advance their salary.

Table 23.1 Reasons for training participation

No	Reasons for training participation	Mean	Std. deviation	N
1.	The certificate of a programme education will contribute significantly to salary development	2.7875	1.28963	80
2.	Participation in ICT programs is deemed mandatory by the authorities of your institution	3.5625	.82437	80
3.	Able to enrich your CV and facilitate your professional development	3.7750	.81092	80
4.	Chance to communicate with and make the acquaintance of other colleagues, and develop closer relationships with them	3.8875	.67494	80
5.	Take advantage of ICT to use it in your personal life (e.g. entertainment, office organization etc.)	3.8750	.87692	80
6.	Take advantage of ICT to use it in course preparation and teaching issues	3.9875	.87863	80

Table 23.2 Difficulty factors for training realization

No	Difficulty factors for training realization	Mean	Std. deviation	N
1.	The inflexible Analytical Curriculum of Study	2.6500	1.00757	80
2.	The application of programs except for time schedule	3.3250	.91090	80
3.	The insufficient in-service training of teachers	3.5625	.89787	80
4.	The lack of interest on behalf of teachers	2.7125	1.04571	80
5.	The insufficient updating (briefing) of teachers	2.9750	1.04306	80
6.	The lack of sufficient material and technical infrastructure	3.8625	1.04025	80
7.	The inadequate (incomplete) financing	3.6375	1.11655	80

Table 23.3 Transfer of training

No	Transfer of training	Mean	Std. deviation	N
1.	Management in school supported in transferring learning to work	4.0250	.65555	80
2.	Able to transfer the learning from training to work	3.9625	.66454	80
3.	Able to control on how to implement the learning	3.9125	.73250	80
4.	Able to learn from your mistakes that happened during transfer of training	4.1000	.64827	80
5.	The training can further control over the job	3.9625	.70160	80
6.	The training has increased work efficiency and effectiveness	4.0625	.69980	80

Based on Table 23.2, it was found that the surveyed teachers were majorly agree that the ICT training was difficult to realised because of the lack of sufficient material and technical infrastructure. Another difficulty factors that quite important are due inadequate financing and insufficient in-service training of teachers. Interestingly the teachers in average were neutral in terms of their perceptions that ICT training

Table 23.4 Pearson correlation matrix

	Transfer of Training	Reasons for training participation	Difficulty factors for training realization
Transfer of training	(.910)		
Reasons for training participation	.360**	(.734)	
Difficulty factors for training realization	.403**	.211	(.749)

Note

Coefficients alpha are in parentheses

**Correlation is significant at the 0.01 level (2-tailed)

was difficult to be realized because of insufficient briefing, the lack of interest and inflexible curriculum of study.

Based on Table 23.3, it was found that the surveyed teachers were mainly agree that the transfer of ICT training happened when they able to learn from their mistakes. Another transfer of training elements of ICT training that quite important are the school management support and increment in efficiency and effectiveness.

The results of this study in terms of dependent and were significantly high in internal consistency but independent variables were quite moderate as per the result of reliability analysis. The dependent variable of transfer of training has a Cronbach’s Alpha of .91 for its total items of 6. While for the two independent variables in this study which are reasons for training participation and difficulty factors for training realization, both has .73 and .75 with total items of 6 and 7 each. As shown in Table 23.4, the Pearson correlation analysis, the results indicated that not all variables are significantly and positively correlated to each other. Transfer of training and reasons for training participation is positively and moderately correlated with .360 and its correlation is significant at the 0.01 level (2 tailed).

The second independent variable is difficulty factors for training realization is also positively and moderately correlated as well with .403 with the dependent variables of training of training where correlation is significant at the 0.01 level (2 tailed). While correlation between both independent variables i.e. reasons for training participation and difficulty factors for training realization were low and not significant at .211. Therefore, it was concluded that all independent variables in this study were significantly and positively associated with the dependent variable of transfer of training although they were not significant associated with each other. To further understand the effects of both independent variables towards the dependent variable in this study, a regression analysis was conducted.

The objective of this research is to determine whether the hypotheses developed for this study is accepted or rejected. The first hypothesis was there will be a positive relationship between reasons for training participation and transfer of training for secondary school teachers who attended ICT training. This simply put that if there is a positive relationship then the more positive feelings that teachers felt in their reasons for joining an ICT training, the more transfer of training will be done by the

Table 23.5 Regression analysis

Variables	Coeff. (B)	Std. error	Beta
Intercept	3.53	.54	
Reasons for training participation	.26**	.09	-.29
Difficulty factors for training realization	-.36**	.11	.34
R ²	.49		
F	12.26**		
df	2		

Note

Dependent variable: Transfer of training

**Correlation is significant at the 0.01 level (2-tailed)

teachers. Subsequently the second hypothesis was there will be a negative relationship between difficulty factors for training realization and transfer of training for secondary school teachers. This second hypothesis merely suggested that the negative relationship will indicate that the more the availability of factors obstructing ICT training to be realized, the less transfer of training can be made by the school teachers after attending ICT training.

As shown in Table 23.5, reasons for training participation and difficulty factors for training realization were the significant determinants for transfer of training with both independent variables were explaining 49 % variations in the dependent variable. Additionally, Beta result shows that difficulty factors for training realization was more important than reasons for training participation in predicting their negative and positive effects each towards transfer of training. Taken together, a teacher's ability to transfer the knowledge he or she had learned in the ICT training to their workplace shall be negatively influenced by the difficulty factors of realizing the training and at the same time was positively influenced by the reasons he or she participated in that training. Therefore, both hypotheses of this study have been supported and the regression equation for this study is *Transfer of training = 3.53 + 0.26 Reasons for training participation – 0.36 Difficulty factors for training realization.*

23.6 Conclusion

In summary, this study has achieved its objectives to identify the impact of reasons for training participation and difficulty factors for training realization towards transfer of training among teachers in a secondary school, as well as to identify which variables that better predict the transfer of training. To the best of this researchers' knowledge, none of prior researches that studied about the effects of reasons for training participation and difficulty factors for training realization towards transfer of training among teachers in a secondary school of Malaysia, thus the researchers have contributed to the knowledge and practices of teaching and learning although still need to be refined by future research.

Practically, this study proved the need for schools' understanding of their teachers' feelings in terms of reasons for training participation as well as factors obstructing the ICT training to be realized that shall affect the trainees' transfer of training. Hence, schools can make references to carefully design ICT training so that any interference and transfer issues can be eliminated in order for the school to achieve better productivity and efficiency. On the other hand, ICT training program can be provided either by the national education system in school or other types of formal or informal learning such as e-learning e.g. Frog, where students can interact with their teachers by using ICT. At the same time, it may enhance the teachers' motivation for learning throughout their whole professional and personal life. Finally, the teachers who are attend the ICT training program could not only have the opportunities to gain specific skills but also chances to develop a critical thinking approach towards any kind of in- service training, to intervene actively in the whole procedure of developing training programmes and thus, make them alert to new training challenges and hopefully help them to become lifelong learners for the benefits of improved educational experience for their student.

References

- Alavi, M., Kayworth, T., & Leidner, D. (2005). An empirical examination of the influence of organizational culture on knowledge management practices. *Journal of Management Information Systems*, 22(3), 191–224.
- Ardies, J., De Maeyer, S., Gijbels, D., & Van Keulen, H. (2014). Students' attitudes towards technology. *International Journal of Technology and Design Education*, 25(1), 43–65. doi:[10.1007/s10798-014-9268-x](https://doi.org/10.1007/s10798-014-9268-x)
- Baldwin, T. T., & Ford, J. K. (1988). Transfer of training: A review and directions for future research. *Personnel Psychology*, 41, 63–105.
- Becker, K. D., Bohnenkamp, J., Domitrovich, C., Keperling, J. P., & Ialongo, N. S. (2014). Online training for teachers delivering evidence-based preventive interventions. *School Mental Health*, 6(4), 225–236. doi:[10.1007/s12310-014-9124-x](https://doi.org/10.1007/s12310-014-9124-x).
- Brinkerhoff, R. O. (2006). *Telling training's story*. San Fransisco: Berrett Koehler.
- Cheng, E., & Ho, D. (2001). A review of transfer of training studies in the past decade. *Personnel Review*, 30, 102–118.
- Heeks, R. (2002). i-development not e-development: Special issue on ICT's and development. *Journal of International Development*, 14(1), 1–11.
- Kang, C. (2007). Classroom peer effects and academic achievement: Quasi-randomization evidence from South Korea. *Journal of Urban Economics*, 61(3), 458–495.
- Kelpanidis, M., & Vrynioti, K. (2004). *Lifelong education*, Ellinika Grammata, Athens I. I: The rise of the network society. Oxford: Blackwell.
- Kyndt, E., & Baert, H. (2013). Antecedents of employees' involvement in work-related learning: A systematic review. *Review of Educational Research*, 83(2), 273–313.
- Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77, 575–614. doi:[10.3102/0034654307309921](https://doi.org/10.3102/0034654307309921).
- Malhotra, N. K. (2004). *Marketing research: An applied orientation* (4th ed.). New Jersey: Pearson Education, Inc.
- Oreglia, E. (2014). ICT and (personal) development in Rural China. *Information Technologies & International Development*, 10(3), 19.

- Salas, E., Cannon-Bowers, J. A., Rhodenizer, L., & Bowers, C. A. (1999). Training in organizations. *Research in Personnel and Human Resources Management*, 17, 123–161.
- Shokri-Ghasabeh, M., & Chileshe, N. (2013). Knowledge management. *Construction Innovation*, 14(1), 108–134. doi:[10.1108/CI-06-2013-0026](https://doi.org/10.1108/CI-06-2013-0026).
- Ullman, E. (2014). Lifelong learners. *Tech & Learning*, 35(1), 64.
- Vosniadou, S. (2007). Conceptual change and education. *Human Development*, 50(1), 47–54.
- Walsham, G. (2001). *Making a world of difference: IT in a global context*. Chichester: Wiley.
- Wang, V. C. (2013). *Handbook of research on teaching and learning in K-20 education* (pp. 1–1180). Hershey: IGI Global. doi:[10.4018/978-1-4666-4249-2](https://doi.org/10.4018/978-1-4666-4249-2)
- Yusri, I. K., & Goodwin, R. (2013). Mobile learning for ICT training: Enhancing ICT skill of teachers in Indonesia. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 3(4), 293–296. doi:[10.7763/IJEEEE.2013.V3.243](https://doi.org/10.7763/IJEEEE.2013.V3.243).

Chapter 24

The Impact of Collaborative Learning Using Wikis Among Japanese as a Foreign Language (JFL) Learners of the Tertiary Level

Persis Dineen Rodrigues

Abstract Although pair and group work are usually used in language classrooms, some studies have explored the nature of such collaboration when students produce a combined work using an online platform. The application of Web 2.0 tools such as wikis, blogs and podcasts has attracted language instructors and learners to further explore the effectiveness of collaborative learning in their language learning environment. Wikis are one of the online learning tools that are commonly known for their online collaborative work. This paper presents the findings of student response of using Wikis for producing an online sushi documentary in a 10-week Japanese language course. The study employed a collaborative learning framework, and it presents qualitative data in the form of learner reflections and learner feedback. The results show that the learners experienced positive learning attributes in enhancing their Japanese language knowledge and understanding of culture. The extended discussion of this study is elaborated along with the suggestions for further research.

Keywords Collaborative learning • Japanese language • Online learning • Web 2.0 tools • Wikis

24.1 Introduction

The diversity of computer-mediated collaboration has greatly expanded in the areas of teaching and learning (Tinio 2002; Chapelle 2003; Levy and Stockwell 2006 and Kening 2007). Various forms of online interaction supported by the current features of computer technology are often referred to as Web 2.0 including wikis, blogs and social networks (Warschauer and Grimes 2007). The use of online communication tools depend on the instructor's language learning objectives.

P.D. Rodrigues (✉)

Taylor's Centre for Languages, Taylor's University, Taylor's Lakeside Campus,
No. 1 Jalan Taylor's, 47500 Subang Jaya, Selangor, Malaysia
e-mail: PersisDineen.Rodrigues@taylors.edu.my

In this context, collaborative learning is focused on Japanese as a Foreign Language (JFL) learners, and these learners learn Japanese language only. In order to support this collaborative learning, one of particular significance is the use of wikis, which supports collaborative learning activities among language learners. O'Reilly (2007) discusses this emerging web technology offers rich user experiences, works in collaboration and stores decentralisation of information in one single platform. Wikis can be an effective tool in positively facilitating constructivist learning and enabling collaboration. Leuf and Cunningham (2001) argue that the primary feature of the wiki enables users to engage in a collaborative and social nature where open editing feature is present.

Apart from the JFL context, the applications of Wikis have been well-documented and researched, especially in teaching writing both in English as a second language (ESL) and English as a foreign language (EFL) contexts (Bradley et al. 2010; Kuteeva 2011; Lee 2010; Sun 2010). The vast research of Wikis shows that the online platform positively facilitates the development of collaborative learning (Thomas 2013). Nevertheless, Yates (2008) affirms that language learning or acquisition can only be appropriately achieved with the suitable combination of task, instructional design and role of instructor.

24.1.1 Objective of the Study

This paper aims to investigate the impact of collaborative learning via Wikis among Japanese language learners for an online documentary in a 10-week Basic Japanese for Communication and Culture module at a Malaysian university.

24.1.2 Research Questions

The aim of this study is investigated through the following research questions:

1. How useful do the participants find online project on a Wiki encourage collaborative learning among group members?
2. To what extent do Wiki features facilitate the improvement of the participants' collaborative learning in an online documentary?
3. What is the participants' feedback towards using Wikis in producing an online documentary related to Japanese language learning?

24.1.3 *Limitations of the Study*

Such findings are limited to exploring the student response of using the Wiki. These findings are based on student reflections and interview sessions. Hence, no broad generalisations will be made in this study.

24.2 Literature Review

24.2.1 *Wikis as Part of Web 2.0*

The functions of the wiki will be emphasised in this study. This collaborative tool was developed by Ward Cunningham, the founder of wiki, in 1994. The term Wiki was used by Cunningham, originally from a Hawaiian word for quick. Leuf and Conningham (2001, p. 4) further explains that wikis are “freely expandable collection of interlinked web pages, a hypertext system for storing, sharing and modifying information – a database, where each page is conveniently edited by any user. The definition of Wiki is also defined as a kind of server software, which allows multiple users to freely and easily construct and edit web page content using any web browser in which hyperlinks are accessible (Widodo and Novawan 2012, p. 2). This definition is further supported by Rollett et al. (2007) on the nature of web 2.0 technologies where learning process through editing features and content using interactive elements (videos and images) are added by users. Augar et al. (2004) further highlight that the main feature of wiki is it allows a user to “visit, read, re-organize, and update”.

In the educational aspect, Tonkin (2005) recommends that the function of Wiki has four main categories:

1. *Single-user*: This feature allows individual learners to write and edit their own thoughts and it is useful for revising content and monitoring changes in understanding period.
2. *Lab book*: This lab book enables learners to peer review notes kept online by adding, for example, commentary or annotations to existing lecture notes or seminar discussions.
3. *Collaborative writing*: This task can be used by a team for joint research such as a group project, essay or presentation.
4. *Creating a topical knowledge repository* for a module cohort: Through collaborative entries students create course content that supplements.

These Wiki categories offer both language teachers and learners what sorts of Wikis they would choose or emphasise in their assigned tasks especially group work. With these categories, a more integrative way to create more dynamic learning activities inside and outside the classroom can be implemented and practised by both language teachers and learners.

Howe (2006–2007) further categorizes the types of processes within the Web 2.0 technologies. Wikis provides a platform for varying modes of interaction with knowledge, such as *you make it*, *you name it*, *you work it*, and *you find it*. *You make it* refers to the user as a contributor of new knowledge or information; while *you name it* describes contributors develop tags for the shared information. *You work it* explains how contributors work together to develop collections of posted information, and further improve the collections. *You find it* means the contributors find topics, trends, and overviews of other contributors in one wiki. In the same online platform, the users have the potential to share knowledge in all of these roles among themselves.

Wikis have been named “an effective tool for educators” (Robinson 2006; Yates 2008). Ben-Zvi (2007) debates that wikis inspire learners to re-edit each other’s pieces and truly reflect on and assess what is being put together in one piece of work. For example, each time a wiki is edited, a separate tracking feature makes note of what changes were made and who made those changes. This feature enables learners keep track of the previous versions. In other words, this function is used as an archive to store substantial information. Such situation can be found in Canole de Laat, Dillon, and Darby’s study (2006) on undergraduate student responses towards using wikis. The researchers concluded that editing or revising someone else’s work developed new forms of evaluation skills that enabled the students to analyse and make constructive decisions about new content.

Wikis also enable learners to gain more content area knowledge because of student contributions in collaborative work (Lian et al. 2011). Therefore, the task of collaborative learning in the context of JFL helps language learners to experience more in an authentic environment despite their limited exposure to the “real” learning environment. However, Zurita (2006) found that there were some inconsistencies or challenges in using the Web 2.0 application. For instance, inconsistencies in technical issues are bound to happen during the learning process among the learners and instructors as well. Managing group work is another challenge for instructors to ensure every single learner is able to access the wiki. Another limitation of using wiki is student expectations on how the instructions should be delivered so that the learning objectives are met.

24.2.2 Online Collaborative Learning

The acceptance of this new generation of online tools has brought impact on teaching and learning context. This era is often referred to as ‘Education 2.0’ or ‘Classroom 2.0’, with the emerging of Web 2.0 socialisation to promote online learning (Sturm et al. 2010; Kessler et al. 2012). Carr et al. (2008) further categorises Education 2.0 into four dimensions: collaboration, publication, literacy, and inquiry. Additionally, Carr et al. (2008) further elaborates that the Education 2.0

provides an online platform for authentic publication. With collaborative online learning, this present study focuses on the impact of using Wikis in an online documentary among the Japanese language learners.

Collaborative learning is viewed as a process where learners pool their knowledge and experiences to create new meanings (Ajjan and Hartshorne 2008). The use of Wikis creates opportunities for students to be highly involved with the given subject matter. With one single online platform, several learners are working together one task, and the resulting texts can be more accurate, authentic, informational and varied (Karasavvidis 2010). Learning process takes place when individuals exercise, verify and consolidate the information through discussion, sharing and editing process. Thus, collaborative learning promotes problem-solving skills among the group members. The asynchronous nature of Wikis has been viewed as promoting cooperation or teamwork rather than competition among the students.

24.2.3 *Constructivism*

Constructivism offers significant insight into the means of facilitating development of learning process. Vygotsky (1978) debates that a child's cognitive development can be further examined in a social interaction with other members of a society. Constructivism leads to scaffolding among peers when working in pairs or group work. Thus, this theoretical approach encourages learners to participate in activities which foster interaction and co-construction of knowledge. Constructivist learning is best learnt by constructing their own learning. Learners are presented with opportunities to build on prior knowledge and understanding in order to construct new knowledge and understanding. This supports autonomous learners where it emphasises the importance of the active involvement of students in the building of knowledge by integrating and consolidating new authentic information (Niederhauser et al. 1999).

24.3 Method

This methodology describes the project framework, background of participants, research design, instruments and procedures employed in this study. Each of this methodology is further elaborated in the following sections. A qualitative method was only employed in investigating the student responses to using Wiki in a Japanese language course. Participants were interviewed to gain a comprehensive understanding of various comments towards using Wiki in their course work. Student reflections were also used to support the findings. The procedures used in collecting the data are supported by a flow chart.

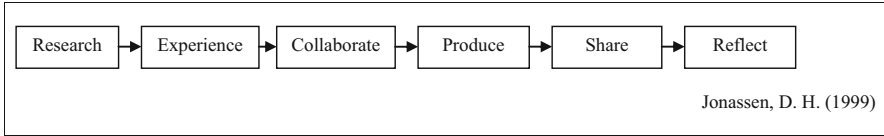


Fig. 24.1 Project-based learning framework

24.3.1 Project-Based Learning Framework

In this study, project-based learning framework was adopted to further elaborate the process of facilitating the project. In the beginning, researching the assigned task was the first step to prepare learners for collaborative work. After researching the assigned topic, the participants were given an opportunity to experience the process of making sushi. After researching and experiencing the whole process of the project, the use of Wikis came into place for participants to gather and produce one piece of work in one single platform. At the end of the project, the complete online magazine was then produced, shared and reflected among the learners. In summary, this framework was employed to show how participants collaborated in one single Wiki (see Fig. 24.1).

24.3.2 Participants

The study was carried out with 30 Japanese Language learners as participants. The participants in this study were aged between 18 and 22 years old. Out of 30 participants, 19 were from Bachelor's Degree Level and 11 were from Foundation Level at a tertiary institution. In this study, there were 16 Degree students and 11 Foundation students from Business School, 2 Degree students from Law School and 1 Degree student from Tourism and Hospitality School. This study was carried out on learners whose proficiency level was limited, and they would have to meet the following pre-requisites:

1. No formal education in Japanese Language at all.
2. Current or ongoing Japanese lessons from other institutions
3. Non-native speakers of Japanese.

In this basic level, all the participants had to complete the 10-week programme as part of their University Elective course.

24.3.3 Research Design

Having the freedom to choose the best methods, techniques and procedures that best explain the research objectives is inevitable (Creswell 2003). After reviewing the methods of research design, a qualitative method was used to provide a complete

picture of the impact of Wiki in collaborative learning among Japanese Language learners. This qualitative method was designed to further explore how other variables had brought impact on the development of collaborative work among the participants. The qualitative method was further supported by research instruments.

24.3.4 Research Instrument

Student reflections and interview sessions were adopted as part of qualitative methods for the investigation. The student reflections covered pre, during and post collaborative tasks via Wikispaces. In the reflections, the participants were required to describe their learning process. Apart from the student reflections, semi-structured interview was used to find out in detail what the participants felt about the Wiki. With student reflections and interview sessions, this qualitative method is appropriate with “why”, “how”, and “in what situation” research questions. Such research design (qualitative) is used to develop intensive knowledge of some related cases (Robson 2002).

Twelve interview questions were posed to each participant. Questions 1, 2 and 3 were dealt with the participants’ preference and convenience. The first question was to find out whether the participants enjoyed using Wiki or and the reasons why they enjoyed it. The second question was to examine whether Wiki is an easy online platform to use, and the third question described the duration of using Wiki features. Questions 6, 7 and 8 were related to editing features of Wiki. The sixth and seventh questions explored whether the editing features were useful in the online project. The eighth question was to find out the frequency of using the Wiki editing features. Questions 4 and 5 were related to the benefits and drawbacks of using the Wiki. The fourth and fifth questions investigated the advantages and disadvantages of using the Wiki respectively. Questions 9 and 10 solicited participants’ recommendations to another instructor and changes in a Wiki. The ninth question was to investigate whether the participants would recommend another instructor to use Wiki; meanwhile the tenth question was to discover student suggestions on how to further enhance the Wiki. Questions 11 and 12 further elicited the participants’ feedback on group work in an online learning platform. The eleventh question was to seek answers from the participants whether they had learnt from each other and the final question was to gain the participants’ thoughts of online projects. The 12 interview questions are as follows:

1. Did you enjoy using the Wiki?
2. Was the Wiki easy to easy to use?
3. How did it take to become easy for you?
4. What was good about the Wiki?
5. What was bad about the Wiki?
6. Were the editing features helpful in your online project?
7. Were the other features (YouTube, video, pictures, etc.) useful in your online project?

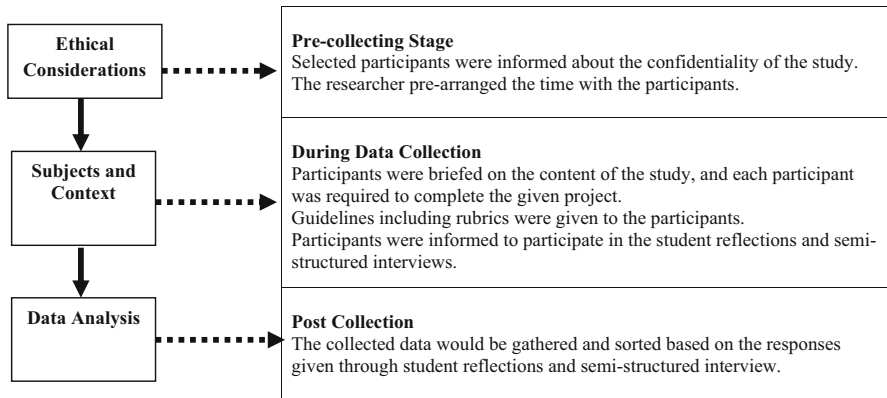


Fig. 24.2 Data collection procedure

8. Did you edit yourself many times?
9. Do you want your next instructor to use a Wiki for online projects?
10. What would you like to change about the Wiki?
11. Did working in groups mean that you learned from one another?
12. What do you think of online projects?

24.3.5 Procedures

The data collection took about 2 months and 2 weeks (3rd February to 18th April, 2014). The procedure is explained in Fig. 24.2.

Figure 24.2 summarises how the data was collected by the researcher. Ethical considerations were taken into account. Firstly, the selected participants were informed about the confidentiality of the study. For this reason, their names would not be revealed in reporting the results, and their examination scores or grades would not be affected by the study.

The second stage began with data collection. During the briefing session, the participants were required to work together in a group of 4–5 to research some information and build shared knowledge on the assigned project. A sample of project guidelines is provided in Appendix A. In order to facilitate this collaborative process, the participants were required to use Wikispaces to support the construction of shared information of the given project. Hence, the Wikispaces provided an online platform to store, organise and display the developing content as the participants worked together to post, revise, edit and reply. Before the sushi competition, the participants collaboratively researched their topic and applied Japanese characters (Hiragana and Katakana) in labelling different types of sushi and the prices. During the sushi competition, the participants had to demonstrate on how to make sushi in a creative and original way. Along the competition, videos or pictures of the whole

competition were documented by the participants. As the final outcome, an online sushi documentary was produced to capture the pre, during and post sessions using the Wikispaces. Upon submission, the participants took part in the interview sessions. The interview session was carried out on a one-to-one basis, and it took about 15–20 min. Both tape-recording and note-taking were used to ensure information given by the participants was not omitted. The interview then was transcribed.

The final stage was to analyse the impact of collaborative learning using Wikispaces among the Japanese learners. At this stage, answers from the participants were further elaborated in the following findings and discussion.

24.4 Findings and Discussion

The findings of the study are presented according to the three research questions. The first research question finds out how the participants' feel about the benefits of online project on a Wiki in the context of collaborative learning. The second research question addresses the participants' feedback towards using Wikis in producing an online documentary, and the final research question further investigates to what extent Wiki features facilitate the improvement of the participants' collaborative learning in an online documentary.

24.4.1 First Research Question

The first research question finds out how useful the Wiki is in helping the participants develop their collaborative learning in an online documentary. The findings of the first research question are organised according to four sections – Participants' Preference and Ability to Use Wikis, the Advantages of Using Wiki, the Disadvantages of Using Wiki and The Impact of Collaborative Learning in Group Work.

24.4.1.1 Participants' Preference and Ability to Use Wikis

Out of 30 participants, only 13 % felt that the Wiki was not enjoyable in helping them develop their collaborative learning. Two of the four participants expressed time was much consumed to understand certain functions of the Wiki. In addition, the 2 participants expressed their concern over the Internet connection which consumed much time for the pages to be uploaded. The third participant (out of the 4) admitted that IT skills were not sufficient. As a result, lack of IT skills hindered that participant to show dislikes in using the Wiki. The last participant (out of the 4) showed less preference in using the Wiki due to editing features. In this case, the last participant felt that editing features were insufficient to enhance the online documentary.

Apart from the 4 participants, the other 87 % participants enjoyed using the Wiki. Nevertheless, out of these 26 participants, 19 % stumbled along the process, and claimed that Wiki was not easy to use. This current finding is in contrast to Thomas's (2013) study whereby a large number of the participants expressed their concern over the inconvenient use of Wikis. The reasons given by the 5 participants were limited editing options, frequent editing activities by group members, preference towards other online platforms and Internet connection issue.

Almost 63 % of the participants learned how to use the Wiki in less than 30 min, because they were quite familiar with some features and their IT skills were good. However, the other 37 % needed more time to get used to the system, and it took them between 1 h and 5 h. The other 5 participants took longer time than the first two groups. On average, each participant took about 1–5 days to know how a Wiki worked. This finding is parallel with another study which debates that the learners have limited or no experience of using the Web 2.0 application. Wichadee (2013) stated that the participants had no prior experience or knowledge of wiki use before undertaking the module.

24.4.1.2 The Advantages of Using Wiki

The three main advantages of using the Wiki were interesting layout, convenience and positive collaborative work. Out of 30 participants, 53 % felt that the Wiki had an interesting and organised layout with editing features. The interactive, organised and clear layout Wiki enabled the 16 participants fully-utilise the editing features. For instance, one of the 16 participants commented that the Wiki was a user-friendly interface as compared to blogs which complicated features were present. This contrasts with editing problems faced by JFL learners in a UK university (Ramanau and Geng 2009). The researchers found that the JFL learners experienced problems of creating and editing Wiki pages. Due to the Wiki's nature, another participant felt that the Wiki used the common posting format like most of the other forums. Nevertheless, another participant expressed the option of using another online platform: Google+, because the participant was more comfortable with the features offered by Google+.

Out of 30 participants, the other 30 % participants found out that the Wiki was easy to use because the editing features were user-friendly. The editing features will be further explored in the last research question. Other than layout and convenience, the other important contribution of using the Wiki was positive collaborative work.

The ability to share thoughts, opinions and discuss with their group members using Wiki was a great impact for the 5 participants. The Wiki allowed the 5 participants to share and communicate with their course mates and instructor on how to develop their online sushi documentary. The current study has similar findings with Othman's study (2007) whereby 20 students in the CMC group expressed their positive comments on sharing thoughts and discussing with peers or group members.

The following Fig. 24.3 describes the five positive feedback given by the participants on collaborative work:

<i>"We could share our experiences in life with others."</i>	(Participant 1)
<i>"It was an ease of sharing work with group members."</i>	(Participant 14)
<i>"Wiki is able to create groups that is easier for other members to use the same page."</i>	(Participant 19)
<i>"Wiki allows members to put pictures and videos, and they can be updated by different people at the same time."</i> (Participant 28)	
<i>"It is a free online platform to publish a webpage."</i>	(Participant 29)

Fig. 24.3 Positive collaborative work

24.4.1.3 The Disadvantages of Using the Wiki

The findings were surprising because along the collaborative process, almost half of the participants faced some obstacles in editing features. 53 % of the participants realised that the editing features had limited varieties in terms of colours, creativity, overriding by other participants at the same page and time, poor formatting page and inconvenient change in font size. In contrast, the group of ‘free-riders’ formed the smallest group for collaborative task in Arnold, Ducate and Kost’s study (2012).

In order to ensure an online Wiki is running smoothly, having a stable Internet connection is essential. 27 % of the participants commented that poor Internet connection could disrupt their online group work. As a result, much time was spent on getting the online collaborative work done. For instance, Participant 4 felt that using the Wiki was too hassle and tedious because of the inconsistent Internet connection. This could be frustrating when the participant could not save the online work in time due to poor connection. Participant 5 needed more time to explore the Wiki; however, the Internet connection was not working well. In Canole et al. (2006) research, the findings showed that some students experienced frustration because of these Internet challenges.

Apart from these two participants, the other 6 participants felt the similar way in Fig. 24.4.

Typically, the levels of IT skills of learners in this study were varied; hence; validating with Kirkwood and Price’s (2005) summary that a few learners have equally high levels of IT proficiency across different ranges of applications. On the other hand, the other 20 % had minimal issues with the Wiki. There were no disadvantages of using the Wiki, as the 6 participants enjoyed doing the collaborative work.

24.4.1.4 The Impact of Collaborative Learning in Group Work

Using the Wiki as an online platform to produce an online sushi documentary has brought a great impact on collaborative learning among the group members. The interview results show that 50 % of participants did benefit from the online group work in terms of sharing information with others, learning from mistakes and solving problems. This finding is consistent with Thomas’s (2013) study on student collaboration using Wikis. One of the participants in Thomas’s study also shared positive collaborative work experience in terms of problem-solving skills.

<i>"Real-time editing feature was terrible."</i>	(Participant 7)
<i>"The upload of title and pictures are quite slow but it could be my own problem since I am doing this Wikispace in a café."</i>	(Participant 8)
<i>"It takes a lot time to finish the project."</i>	(Participant 13)
<i>"It's so time-consuming to adjust the images."</i>	(Participant 28)
<i>"It's kind of slow to upload and it auto-rotates the images."</i>	(Participant 26)
<i>"It's not a user-friendly interface, because the images were slowly uploaded. As a result, we resorted to using external image hosting websites to upload those images and link them to the Wiki."</i>	(Participant 29)

Fig. 24.4 Technical difficulties

These positive attributes encouraged the 15 participants to collaborate more in making sure their online sushi documentary more informative and meaningful. For example, Participant 29 felt that working in groups encouraged the members learn from one another since Japanese Language was a new and foreign language to them. This participant's feedback was in line with another Participant 21 who shared the same concept of learning a new foreign language. According to Participant 21, online collaborative work motivated the members to learn more about sushi-making. Collaborative learning indeed increases the level of motivation among the learners (Hadjerrouit 2007). Participant 19 noticed the diversity of group members in terms of different study programme, language ability, research skills and learning styles allowed the members to seek creative ideas on how to produce an interesting online sushi documentary.

In order to ensure collaborative learning effectively takes place in an online learning environment, teamwork and good communication skills are two important factors. Out of 30 participants, the other 37 % of participants recognised online group effort was the main contributor of collaborative learning. This current finding is supported by Ramanau and Geng's study (2009) on researching the use of Wiki's to facilitate group work in the context of JFL. In their study, initiatives among the members were important to ensure the assigned was completed within the given timeline. With the use of Wiki, the team members were able to collaborate the work efficiently. In addition, collaborative effort encouraged the members to work faster on their assigned task. Along the process, 4 out of 11 participants felt that the importance of acknowledging the members' strengths and weaknesses. By acknowledging the two important keys, the 4 participants were inspired to share or provide different perspectives on how to make the documentary more attractive.

The remaining 13 % did not see the point of having the Wiki as an online platform to encourage collaborative learning, because of time constraint and lack of commitment by certain group members.

24.4.2 Second Research Question

In answering research question 2, the subsequent findings are presented into two parts. The first part is to find out the impact of Wiki editing features in online collaborative learning and the final part is to seek feedback from the participants on what to further improve the Wiki.

24.4.2.1 The Impact of Wiki Editing Features

The main benefit of using Wikis is the editing features which allow learners to experience the drafting process. 83 % of participants appreciated the usefulness of Wiki editing features, because the features allowed students collaboratively identify the mistakes and correct them in order to improve their written documentary. During this drafting process, the learners worked together in exploring the existing features to further enhance their written skills (Widodo and Novawan 2012). However, the other 17 % of participants did not value the editing features. Among the 5 participants, only four found other features like uploading YouTube videos, images, audio and documents were quite useful except one participant whom did not fully utilise the additional features. This particular participant preferred other Web 2.0 applications such as Wordpress and Blogger.

63 % of participants had to edit their respective work about three times, before submitting the final outcome. These 19 participants expressed their preference towards the editing features, because they could see some improvement in their online documentary. Re-editing the online documentary more than three times was not good for the other 37 %, because the whole process consumed much time and it could be a demotivating factor for them.

24.4.2.2 Future Changes in Wiki

The findings showed that 43 % of participants recommended that more editing features should be added such as a variety of font sizes and colours, a simpler layout and additional background layouts. In terms of technical support, 23 % of participants were hoping to see a more user-friendly Wiki with minimal technical glitches such as unloaded pages or page errors and the position of navigation buttons were not easily be found. The other remaining 33 % gave no comments on whether the Wiki should be further enhanced.

24.4.3 Third Research Question

The third research question finds out whether the Wiki was helpful in developing collaborative work in online projects. The findings of the last research question are described in three parts. The first part explores the participants' view on involvement in online projects; meanwhile the second part describes learning attributes gained by the participants. The final part finds out whether the participants would prefer the next instructor to use Wiki.

24.4.3.1 Involvement in Online Projects

Out of 30 participants, only 7 % felt that online projects via Wiki were just neutral for them, because they felt there were other better platforms to do online projects. Apart from these two, the use of Wiki in online sushi documentary motivated the other 93 % appreciate Japanese Language more. For example, Participant 10 liked the idea of leaving comments on the Wiki pages, because it encouraged members to learn more of the language and its culture. Schmitt (2014) points out that this peer-to-peer engagement is critical for increasing motivational level and focuses on communication. Involvement in online projects gave Participant 15 to fully acknowledge the IT skills as part of the strength.

Another advantage of involving in online projects is promoting blended learning. Out of 28 participants, 8 participants felt that online projects through Wiki gave them the opportunity to work on a single project at anytime and anywhere without having frequent face-to-face discussion. For instance, Participant 21 commented that online projects through Wikis made collaborative work easier for every member because members could complete the project at home instead of meeting up in classroom. This finding is consistent with Thomas's study (2013) because the learners would be able to access the Wikis from homes. The other 11 participants gained much learning from the online projects. Nevertheless, 5 out of 28 participants realised that online projects took longer time to complete one project due to frequent editing tasks and unstable Internet connection.

2 out of 28 participants saw the future connection between the use of Wiki and job prospect. Participant 13, for example, understood the importance of experiencing online projects, because the involvement increased the learning skills which would be an additional value to the job resume. In terms of environmental aspect, online projects are seen as a replacement for printing papers in bulk. Participants 2 and 19 were satisfied with the use of Wiki for online projects as friendly environmental concepts were fully supported.

24.4.3.2 Learning Attributes in Online Collaborative Projects

Team work was the main learning attribute among the 30 participants in online collaborative projects. In a team, strengths and weaknesses were acknowledged by the participants. Acknowledging the diversity of a group gave the participants to carefully choose their respective jobs or tasks in order to achieve the learning outcomes of an online sushi documentary. A simple job delegation checklist was given to all the participants as part of the project requirement (see Appendix B).

At the initial stage, all participants had to plan and discuss their choice of sushi, before presenting it at the competition. During this stage, time management skills were important in order to reduce anxiety among the members. Planning the project in advance would also help the participants acknowledge the initial problems and provide solutions. Collaboration learning was much emphasised in this context because the participants felt that this approach helped them learn the research skills

much faster. During the initial stage, the participants had to deal with patience, tolerance and compromise because some group members had arguments about the job delegation. The use of Wiki served as an online platform for the participants to draft and discuss their choice of sushi. During the process, the participants also felt that their communication skills were enhanced in terms of written discourse in Japanese language and English language as well.

During the sushi competition, all participants had to demonstrate their chosen types of sushi. During this process, every participant had his or her role to ensure the entire competition was successful. Strong confidence, commitment and perseverance were important learning attributes for the participants. With these three positive learning attributes combined, self-determination theory (Deci and Ryan 1980; Ryan and Deci 2000) is much focused on the extent to which learners can exercise control over their learning environment. This theory has been applied to language learning context (Noels 2001). In this situation, the participants had strong intrinsic motivation that reflected their willingness to engage in the online project.

After the competition, the use of Wiki was fully utilised as the participants had to produce an online sushi documentary. Creativity and originality were very crucial elements in making sure the online documentary was attractive and interesting. The participants felt that the whole sushi project was meaningful because the participants had the opportunity to experience some Japanese culture. By having this project, appreciation towards Japanese culture was highly emphasised. The participants were able to learn more words or phrases in Japanese and know the history of sushi. Sense of belonging was much felt among the participants.

24.4.3.3 Wiki as a Future Platform for Online Collaborative Projects

19 out of 30 participants would prefer the next instructor to use Wikis in their online projects. For example, the 19 participants felt that using Wikis would be easier, more convenient and environmental friendly. The other 11 remaining participants showed less preference for the next instructor to employ Wikis, because much time was spent, editing features were not user-friendly and limited and other online platforms such as Google Doc, Wix, Wordpress and Blog were better. These findings show that the transparency feature of Wikis has contributed the development of collaboration work among learners traceable and retrievable to the instructors (Carr et al. 2007).

24.5 Extended Discussion

The use of Wikis has brought major development of collaborative learning among the Japanese language learners in terms of being active members. The online platform helped learners gain much confidence in developing the language skills especially vocabulary and characters writing because they could freely express their creativity without being assessed solely on the basis of a final submission of their

essay. The development of collaborative learning; is therefore, crucial to capture the learning process that takes place in an online platform. Ismail (2012), Huffaker (2005) and Murray and Hourigan (2008) further argue that having several drafts would encourage the learners to be more expressive, fearless or less worried in expressing their ideas in collaborative tasks.

Apart from gaining self-confidence, Wikis also encourages learners to have more sense of ownership and autonomy in creating a new online sushi magazine with all the relevant Japanese words or phrases. Their online sushi magazines signify authentic publication. However, the amount of instructor intervention and student autonomy in collaborative projects can influence the learning process, which should be taken in consideration (Kessler et al. 2012).

Another important point is that the researchers should consider the pedagogical considerations, because wiki pedagogy can be a significant factor affecting the quality of Wiki applications. In this language learning context, the researchers should first incorporate the recommendations of several learning approaches for a Wiki to be effectively utilised. For instance, the researchers should consider whether to include social constructivist, interactionist, cognitivist and expressivist approaches into their writing learning instructions (Ismail 2012, p. 26). These learning approaches create an environment where the promotion of learner-centered and collaborative learning are fully enhanced. In other words, successful student contributions on Wiki depend on the given task authenticity (Bower et al. 2006).

With the function of Wikis, student learning motivation can be increased, because the online learning platform provides extensive sharing information among the group members. Learning from peers on a single platform could further motivate the members to achieve greater results.

In order to maintain student motivation throughout the collaborative learning process, instructional scaffolding is needed in the form of lab-based exercises (Cole 2009; Harsell 2010). Otherwise, this technical challenge can affect their motivational level and desire to produce good final outcomes using Wikis.

24.6 Conclusions

Based on the findings of this study, more support is needed by the instructor as the Wiki allows that person to constantly monitor student progress via the student's wiki pages. Also, as the Wiki creates a learning environment for the students, they are able to refer back to it, not only to do their work, but also to get more information about their corrections. In addition, the students are able to contact the instructor when they need help. For these reasons mentioned, wikis may have aided the feedback process by providing the instructor with more first-hand information. As for future research, it is recommended to look at the effects of online co-operative learning on student learning strategies in learning Japanese as a Foreign Language. With the use of Wikis, it is interesting to know different learners adopt metacognitive, cognitive and socioaffective strategies in the field of language learning (O'Malley and Chamot 1990).

Although this research has involved 30 participants, it is recommended that a more extensive sampling is needed to validate the current findings and also to compare the current findings with other levels of Japanese Language. In terms of research duration, the present study was not evaluated in detail as the time frame was rather short (10 weeks), which was certainly another limitation. Khatri (2013) argues that it can be challenging to teach writing skills to learners and try to assess them during a shorter period of time.

In conclusion, the potential educational benefits of Wiki have been fully utilised by the learners in collaborative learning. Nevertheless, there are learners who prefer the other online learning platforms such as Google Doc, Wix, Blogs, Google+ and so on. Technical challenges of using Wiki as new learning tools should not be overlooked because these challenges can reduce the learners' motivation in progressing further. For this reason, training sessions are needed to address the academic and social aspects of Wikis within the classroom environment (Harsell 2010).

Appendix A

Summary of Coursework:

No.	Topic	Type of assessments	Assessment mode	Duration	No. of students (per group)	Deadlines (2014)	Marks breakdown
1	Sushi competition	Practical	Group work (Peer assessment)	2 h	4-5	17th Oct	10
		Online Written Assignment (via Wikispaces)		N/A		3rd Nov	5
TOTAL:							15

Coursework

Topic	:Basic Japanese for Culture
Sub-topic	:Sushi Competition
Practical Instructions [10 marks]	:a. Choose 3 OR 4 types of sushi. :b. Prepare the relevant ingredients for sushi making (as long as it is HALAL). :c. These relevant ingredients MUST be prepared at home. :d. Ensure those ingredients are carefully labeled in two languages: English & Japanese (Hiragana & Katakana ONLY). :e. Take some photos while making the sushi for documentary purpose. :f. Bring your own tools, containers, tissue packs, garbage bags and newspapers.

- Written Instructions [5 marks]
- :a. Produce an online magazine of sushi making.
 - :b. This online magazine must consist of introduction of the history of sushi (in English), the making procedure (in English), ingredients and prices in (Hiragana & Katakana ONLY), and your group reflection on this coursework (in English).
 - :c. The online magazine must include relevant descriptions, taken photographs at the sushi competition scene or any other relevant materials that support the sushi making process.
 - :d. Publish your online magazine via Wikispaces.
 - :e. It is optional for you to produce a short video of the whole process.

Appendix B

Delegated Group Tasks

- Group Name :
- Group Leader :
- Group Members :

Delegated Tasks

No.	Assigned tasks	Person in-charge
1		
2		
3		
4		
5		
6		
7		
8		

References

Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical tests. *Internet and Higher Education*, 11, 71–80.

Arnold, N., Ducate, L., & Kost, C. (2012). Collaboration or cooperation? Analyzing group dynamics and revision processes in wikis. *CALICO Journal*, 29(3), 431–448. <http://journals.sfu.ca/CALICO/index.php/calico/article/view/20/37>. Accessed 5 Oct 2014.

- Augar, N., Raitman, R., & Zhou, W. (2004). Teaching and learning online with wikis. *Proceedings of ASCILITE*. <http://ascilite.org.au/conferences/perth04/procs/augar.html>. Accessed 25 Sept 2014.
- Ben-Zvi, D. (2007). Using wiki to promote collaborative learning in statistics education. *Technology Innovations in Statistics Education, 1*(1). <http://repositories.cdlib.org/uclastat/cts/tise/voll/iss1/art4>. Accessed 22 Sept 2014.
- Bower, M., Woo, K., Roberts, M., & Watters, P. (2006, July). Wiki pedagogy – A tale of two wikis. In Information technology based higher education and training, 2006. ITHET'06. 7th International Conference on Information Technology Based Higher Education and Training (pp. 191–202) IEEE: Sydney. https://wiki.mq.edu.au/download/attachments/96993397/tale_of_two_wikis.pdf?version=1&modificationDate=1424305428000. Accessed 20 Sept 2014.
- Bradley, L., Lindstrom, B., & Rystedt, H. (2010). Rationalities of collaboration for language learning in a wiki. *ReCALL, 22*, 247–265.
- Canole, G., de Laat, M., Dillon, T., & Darby, J. (2006, December). JISC Student experiences of technologies. Final report. <http://www.jisc.ac.uk/publications/publications/lxpfinalreport.aspx>. Accessed 31 Aug 2014.
- Carr, T., Morrison, A., Cox, G., & Deacon, A. (2007). Weathering wikis: Net-based learning meets political science in a South African university. *Computers and Composition, 24*, 266–284.
- Carr, D., Crook, C., Noss, R., Carmichael, P., & Selwyn, N. (2008). Education 2.0? Designing the web for teaching and learning: A commentary by the technology enhanced learning phase of the teaching and learning research programme. <http://www.tlrp.org/pub/documents/TELcomm.pdf>. Accessed 15 Sept 2014.
- Chapelle, C. A. (2003). *English language learning and technology*. Amsterdam: John Benjamins Publishing Company.
- Cole, M. (2009). Using Wiki technology to support student engagement: Lessons from the trenches. *Computers & Education, 52*(2009), 141–146. www.google.com.my/url?sa=f&rct=j&url=http://www.sciencedirect.com/science/article/pii/S0360131508001061&q=Using+Wiki+technology+to+support+student+engagement:+Lessons+from+the+trenches&ei=kq5WUdPXjWJrAf5ooD4Dg&usq=AFQjCNF7mxDEahp6-Ta6svK5pb4jqt2QHQ. Accessed 6 Sept 2014.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed methods approaches* (2nd ed.). Thousand Oaks: Sage.
- Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. *Advances in Experimental Social Psychology, 13*, 39–80.
- Hadjerrouit, S. (2007). A blended learning model in java programming: A design-based research approach. In *Proceedings of the computer science and IT education conference* (pp. 283–308), Mauritius.
- Harsell, D. M. (2010). Wikis in the classroom: Faculty and student perspective. *Journal of Political Science Education, 6*(3), 310–314.
- Howe, J. (2006–2007). Your Web, your way. *Time Magazine, 168*(26), 60–63.
- Huffaker, D. (2005). The educated blogger: Using weblogs to promote literacy in the classroom. *AACE Journal, 13*, 91–98.
- Ismail, F. S. (2012). Using blogs and wikis to foster learner's engagement in an inclusive process writing model. In *ICT and ELT research and practices in South East Asia* (pp. 17–32). Penerbit Universiti Sains Malaysia: MELTA-USM ELT in South East Asia Series.
- Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional- design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 215–239). Hoboken: Taylor and Francis.
- Karasavvidis, I. (2010). Wiki uses in higher education: Exploring barriers to successful implementation. *Interactive Learning Environments, 18*(3), 219–231.
- Kenning, M. (2007). *ICT and language learning: from print to the mobile phone*. New York: Palgrave Macmillan.
- Kessler, G., Bikowski, D., & Boggs, J. (2012). Collaborative writing among second language learners in academic web-based projects. *Language Learning & Technology, 16*(1), 91–109.

- Khatri, R. (2013). Feedback, student collaboration, and teacher support in English as a foreign language writing. *International Journal of Scientific Research (IJSR)*, 2(2), 70–75. <http://www.stlthe.ca/wpcontent/uploads/2011/05/Feedback-Student-Collaboration-and-Teacher-Support-In-English-as-a-Foreign-Language-Writing.pdf>. Accessed 1 Oct 2014.
- Kirkwood, A., & Price, L. (2005). Learners and learning in the 21st century: What do we know about students' attitudes and experiences of ICT that will help us design courses? *Studies in Higher Education*, 30(3), 257–274.
- Kuteeva, M. (2011). Wikis and academic writing: Changing the writer-reader relationship. *English for Specific Purposes*, 30(1), 44–57.
- Lee, L. (2010). Fostering reflective writing and interactive exchange through blogging in an advanced language course. *ReCALL*, 22, 212–227.
- Leuf, B., & Cunningham, W. (2001). *The wiki way: Quick collaboration on the web*. Upper Saddle River: Addison Wesley.
- Levy, M., & Stockwell, G. (2006). *CALL dimensions: Options and issues in computer-assisted language learning*. Mahwah: Routledge.
- Lian, C. M., Hoon, T. B., & Abdullah, M. H. (2011). Wiki for co-writing a science dictionary. *GEMA Online Journal of Language Studies*, 11(3). <http://ejournal.ukm.my/gema/article/view/45/39>. Accessed 21 Apr 2014.
- Murray, L., & Hourigan, T. (2008). Blogs for specific purposes: Expressivist or socio-cognitive approach? *ReCALL*, 20, 82–97.
- Niederhauser, D. S., Salem, D. J., & Fields, M. (1999). Exploring teaching, learning, and instructional reform in an introductory technology course. *Journal of Technology and Teacher Education*, 7(2), 153–172.
- Noels, K. A. (2001). New orientations in language learning motivation: Towards a model of intrinsic, extrinsic and integrative orientations and motivation. In Z. Dornyei & R. W. Schmidt (Eds.), *Motivation and second language learning* (pp. 43–68). Honolulu: University of Hawaii Press.
- O'Malley, M., & Chamot, A. U. (1990). *Learning strategies in second language acquisition*. New York: Cambridge University Press.
- O'reilly, T. (2007). What is Web 2.0: Design patterns and business models for the next generation of software. *Communications and Strategies*, 65(1), 17–37. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1008839. Accessed 28 Sept 2014.
- Othman, N. (2007). Investigating writing in a computer-mediated communication language classroom. *Internet and the English Language Classroom*, 1(3), 53–80. Petaling Jaya: Sasbadi-Melta ELT Series.
- Ramanau, R., & Geng, F. (2009). Researching the use of Wiki's to facilitate group work. *Procedia-Social and Behavioral Sciences*, 1(1), 2620–2626. Accessed 1 Oct 2014.
- Robinson, M. (2006). Wikis in education: Social construction as learning. *The Community College Enterprise*, 12, 107–109.
- Robson, C. (2002). *Real world research* (2nd ed.). Malden: Blackwell.
- Rollett, H., Lux, M., Strohmaier, M., & Dosinger, G. (2007). The Web 2.0 way of learning with technologies. *International Journal of Learning Technology*, 3(1), 87–107.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25, 54–67.
- Schmitt, L. (2014). Student attitudes to wikis in an online class. *Attitudes to technology in ESL/EFL pedagogy*. Dubai: TESOL Arabia Publications. https://www.academia.edu/8132356/Student_attitudes_to_wikis_in_an_online_class. Accessed 30 Sept 2014.
- Sturm, M., Kennell, T., McBride, R., & Kelly, M. (2010). The pedagogical implications of Web 2.0. In A. Tatnall (Ed.), *Web technologies: Concepts, methodologies, tools, and applications* (pp. 1536–1553). Hershey: Information Science Reference.
- Sun, Y. C. (2010). Extensive writing in foreign-language classrooms: A blogging approach. *Innovation in Education and Teaching International*, 47, 327–339.

- Thomas, S. (2013). What's in a Wiki for Me? How a Wiki can be used to enhance a language learning classroom and student collaboration. *THT Journal*, 11. http://www.tht-japan.org/proceedings/2013/011_032_thomas.pdf. Accessed 8 Oct 2014.
- Tinio, V. L. (2002). *ICT in education*. <http://www.apdip.net/publications/iespprimers/eprimer-edu.pdf>. Accessed 31 Jul 2014.
- Tonkin, E. (2005, January). Making the case for a wiki. *Ariadne*, 1(42). <http://www.ariadne.ac.uk/issue42/tonkin/>. Accessed 15 Oct 2014.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge: Harvard University Press.
- Warschauer, M., & Grimes, D. (2007). Audience, authorship, and artifact: The emergent semiotics of Web 2.0. *Annual Review of Applied Linguistics*, 27, 1–23.
- Wichadee. (2013). Improving students' summary writing ability through collaboration: A comparison between online wiki group and conventional face-to-face group. *The Turkish Online Journal of Educational Technology*, 12(3), 107–116. <http://www.tojet.net/articles/v12i3/12310.pdf>. Accessed 18 Aug 2014.
- Widodo, H. P., & Novawan, A. (2012). Implementing Wiki and blog, mediated writing tasks in an EFL context. In *ICT and ELT research and practices in South East Asia* (pp. 1–16). Penerbit Universiti Sains Malaysia: MELTA-USM ELT in South East Asia Series.
- Yates, N. (2008). Wikis and constructivism: Exploring the links. *The JALT CALL Journal*, 4(3), 15–28. http://jaltcall.org/journal/articles/4_3_Yates.pdf. Accessed 1 Oct 2014.
- Zurita, L. (2006, April). *Learning in multicultural environments: Learners as do-designers*. Paper presented at Networked Learning 2006, Lancaster, UK. <http://www.networkedlearningconference.org.uk/past/nlc2006/abstracts/Zurita.htm>. Accessed 26 Sept 2014.

Chapter 25

Postgraduate Students' Engagement Through Critical Literacy Awareness

Sarjit Kaur and Gurnam Kaur Sidhu

Abstract Being able to read academic texts and think critically is a much sought after skill in today's globalised work environments. Postgraduate students need to learn how to develop their critical literacy awareness by being able to read and discuss a wide range of texts as it is seen as a response to the social construction of one's peers, culture, family, classrooms, neighbours, communities and world (Lesley M, J *Adolesc Adult Lit* 48(4):320–334, 2004). Responding to local concerns about the lack of attention accorded to the development of postgraduate students' critical literacy awareness, this paper suggests the use of critical literacy strategies advocated by the New London Group (Har Educ Rev 66(1):60–92, 1996) and Kress (*Literacy in the new media age*. Routledge, New York, 2003) to increase students' motivation and engagement in multimodal environments. Two course lecturers and 30 MA postgraduate students from two public universities in Malaysia participated in this study. The qualitative data cover two intact classes of each of the lecturers who teach literacy and pedagogy courses. The findings gleaned from the audio-taped student-teacher interactions and focus group interviews suggest that majority of the postgraduate students appreciated the following developmental stages in using the four knowledge processes in classroom activities: situated practice, overt instruction, critical framing and transformed practice. The implications of the study suggest that university lecturers can actively use the critical literacy awareness framework in their classrooms as it can generate active student voices and promote more meaningful learning experiences among their postgraduate students. Such pedagogical strategies can be integrated into current higher education curriculums to enhance active student participation in taught postgraduate classrooms.

S. Kaur (✉)

English Language Studies Section, School of Humanities, Universiti Sains Malaysia,
11800 Gelugor, Penang, Malaysia

e-mail: sarjit@usm.my

G.K. Sidhu

Faculty of Education, Asian Centre for Research on University Learning and Teaching,
Universiti Teknologi MARA, Campus Section 17, 40200 Shah Alam, Selangor, Malaysia

e-mail: gurnamsidhu@salam.uitm.edu.my

Keywords Critical literacy awareness • Knowledge processes • Pedagogical strategies • Postgraduate student engagement

25.1 Introduction

Rapid developments in information and communication technology make it necessary for educators to keep pace with learning and teaching practices. Evolving transformations and the wide use of social and media apps place a critical demand on the way education is offered in the twenty-first century classroom towards meeting manpower needs of the future. Within the backdrop of changing trends in higher education, postgraduate education continues to face “multiple challenges in terms of demand, supply, quality and returns, both for providers and the clientele concerned” (Kearney 2008, p. 1). It is seen as a diverse area of higher education provision that brings enormous benefits to individual graduates, to the economy and to society. Notwithstanding global concerns, the Malaysian higher education system has also been challenged to produce graduates who can operate successfully in the nation’s vision towards being labelled as an advanced nation by 2020.

It is not uncommon to have teachers in the Malaysian higher education sector complain that many postgraduate students are not capable of processing information in a critical manner and do not question information sources and hence are unable to move on to create new ideas and perspectives. They are reluctant to “question the perceived authority of texts and lecturers; and have a tendency to accept ideas as they are presented” (Koo et al. 2012: p. 732). Other local researchers have documented research findings that state that many Malaysian students who qualify for tertiary education and graduate from the system are perceived as ‘unfit’ for employability as they are deemed lacking in quality, especially in their critical thinking, problem solving and soft skills (Morshidi Sirat et al. 2008). In tackling this issue at the school level, the national Education Blueprint (2013–2025) has put in place strategies to improve this aspect by advocating a set of refined articulation of the specific skills and attributes which include cognitive skills, creative thinking, innovative thinking and reasoning. It is believed that such attributes would help generate future learners who can compete in global economies. This policy prescription rests on the idea of a knowledge economy where innovative ideas and technical expertise hold the key to a new global competitive challenge.

One crucial element in getting postgraduate students who are following taught MA courses to read with greater focus is to create interest in the reading material. The overall strategy for creating interest in reading is to tap into readers’ prior knowledge. It is not uncommon to find that most readers never questioned who was writing the text when they were in school as they tended to believe everything they read. Reading has always been viewed as a challenging skill by many ESL learners. Even in the Malaysian context, there are scant research studies focusing specifically on analysing students’ critical thinking and awareness in reading various types of texts, including the scope of discussion on language and literary studies in the local

context (Krish et al. 2012). It has also been reported that research studies involving tertiary learners are relatively small in number (Normazidah et al. 2012; Koo et al. 2012; Kaur 2013). These researchers lament that more research is needed to better situate the identity issues of tertiary learners and their learning experiences. In other studies conducted in Malaysia, several researchers have reported that tertiary learners have limited critical ability because of the didactic nature of the learning process (Kaur et al. 2012; Kaur 2013). Nambiar (2007) also reports that Malaysian tertiary learners lack conventions of academic writing, are weak at understanding long sentences or sentences with difficult words and she contends that such limitations impose unnecessary barriers on students' comprehension abilities at institutions of higher learning. Several researchers also corroborate this fact and report that predominantly Malaysian ESL learners are not able to operate autonomously when they engage with a range of academic reading tasks (Koo et al. 2012; Kaur et al. 2012).

25.1.1 Critical Literacy Awareness: Concept and Focus

In the past, the common understanding of literacy often centred on the ability to read, write and count but this has since been expanded to include other skills and competencies (Pescatore 2007). In most educational contexts, these basic literacies are no longer sufficient for an individual to function as an efficient employee in today's increasingly globalised workplaces. When referred to from the perspectives of education, 'critical literacy' can be defined as reading and writing pedagogy that examines an omnipresent, unstated social agenda of power (Lesley 2004). This would mean that it can be a credible pedagogy only if it can allow learners to understand and unravel the biases and prejudices that exist in a given language. Some of the aims of instilling critical literacy awareness among students are to recognise the non-neutral facet of language, examine power relations in texts, identify multiple voices in texts and address their own belief system in responding to a text (Kress 2003; Lesley 2004; Behrman 2006). These authors explain that the practice of critical literacy and the instilling of critical literacy awareness requires higher comprehension levels of reading because it embraces multiple and conflicting perspectives of learners. Hence, due to the complexity of this process, teachers need to be patient in guiding learners towards achieving an awareness of critical literacy and becoming autonomous learners but cannot expect it to be an automatic process of learning.

Rapid and continued advances in technology and sciences have generated new ways of communication which have impacted our lives. As such, students now have multiple ways to communicate with one another and this creates changes in the ways we channel information with other people. Such transformations have altered the way we learn and our learning environment. McLaughlin and DeVogd (2004, p. 52) stress the importance of acquiring critical literacy so that "students can expand their reasoning, deepen their understanding, seek out multiple perspectives and become active thinkers who comprehend from a critical stance". In her continuum of reading skills, Rosenblatt (2004) states that readers are always making choices about their thinking and reading from a critical stance as it allows readers to

use their background knowledge to understand the relationships between their ideas and the ideas presented by the author of the text. This process, according to Rosenblatt (2004) allows readers not only to play the role of code breakers, meaning makers and text users but also the role of text critics.

Considering the emergence of New Literacies in today's digital age of information explosion and the changing literacy needs of learners, critical literacy then becomes pivotal in pedagogy design. As learners are confronted by overwhelming information posed by the waves of technology, critical literacy is able to allow learners to digest information with accountability and become critical consumers of the information that they receive. Work on critical literacy originated from the constructivism theory (has roots in philosophy and psychology), which explains how knowledge is constructed in the human being when information comes into contact with existing knowledge that had been developed by experiences. In this regard, scholars who advocate teaching students critical literacy believe that the theory of constructivism in the field of education lays emphasis on the ways knowledge is created in order to adapt to the world and that the theory encourages educators to use some of the following number of applications in order to make learning meaningful: discovery learning, hands-on learning, experiential learning, project-based learning, collaborating with peers and task-based learning.

It is imperative for teachers to understand that they need to use teaching strategies that will encourage learners to grow and mature into thinking individuals who can contribute to today's knowledge economies. In order to inculcate the culture of thinking critically in a classroom, teachers can adopt the critical learning awareness instruction in the classroom. This approach draws from the pedagogy of multiliteracies developed by the New London Group (1996). The term 'multiliteracies' was formulated based on the following important aspects: the emerging cultural and global demand, the range of the multiplicity of communications channels and media, and the growth of cultural and linguistic diversity. The philosophy of multiliteracies was extended by Janes (2009, p. 5) as she explained that there are three key aspects of a multiliteracies concept:

- (a) pedagogy (a call for educators to become designers of learning)
- (b) diversity (presenting a broader view of literacy than portrayed by traditional language-based approaches)
- (c) multimodality (a need for a multiplicity of communication channels)

In principle, the multiliteracies pedagogy was designed as part of a broader approach to literacy which recognises diversity of language and the increasing multimodality of contemporary communication. Table 25.1 below illustrates the multiliteracies pedagogy advocated by the New London Group (1996).

The present study adopted the multiliteracies pedagogy (Kalantzis and Cope 2004) as its theoretical framework and incorporated the advocated four knowledge processes in a critical literacy awareness (CLA hereafter) model. The pedagogy was utilised in the postgraduate taught course by outlining instructional activities as 'teacher instruction' and student-related activities as 'student activities' in relation to the curriculum offered in the selected MA courses in both the participating universities. In using the label of 'moves', the model allows for flexibility in both

teacher and student activities as these are not necessarily viewed in a linear sequence and can therefore overlap with in-class interactions among students and the teacher. In the model derived from the multiliteracies pedagogy, the researchers outlined the following model (Table 25.2).

As the focus of the study is on encouraging learners to become critical readers and discussants, one of the principal agents in the learning process is the teacher who needs to direct learning in the first instance through understanding his/her learners' knowledge about the topical area and the level of immersion in the range of discourses and lifeworlds being discussed in class. The teacher would have to make certain scaffolding choices in an effort to motivate and engage the students in the learning activity. While it is acknowledged that the teacher has significant autonomy in making choices about strategies to use for classroom activities, the lesson's aim and focus will help provide the much needed parameters for further discussion and understanding. As such, during the '*overt instruction*' phase, the teacher will provide instruction and explanations pertaining to the activity in order to ensure that systematic, analytic and conscious understanding occur among the students (Kalantzis and Cope 2004). While these stages or moves can also generate student intervention, the teacher essentially exercises influence over options about language, particularly in multilingual contexts.

Table 25.1 The multiliteracies pedagogy

Designs for learning	Multiliteracies pedagogy
<i>Experiential knowledge</i>	<i>Situated practice</i>
Learning activities focused on personal knowledge, concrete experience, evidence data	Immersion in experience and the utilisation of available discourses, including those from students' varied lifeworlds
<i>Conceptual knowledge</i>	<i>Overt instruction</i>
Learning activities focused on abstract concepts and theoretical synthesis	Systematic, analytic and conscious understanding. The introduction of an explicit language to describe the design of meaning
<i>Analytical knowledge</i>	<i>Critical framing</i>
Learning activities focused primarily on analysing and interpreting the functions, interest and perspectives	Interpreting the social and cultural context of particular designs of meaning, standing back from meanings and viewing them critically in relation to their purposes and cultural context
<i>Applied knowledge</i>	<i>Transformed practice</i>
Learning activities focused primarily on making knowledge, creating meanings and making a practical impact on the world	Transfer in meaning-making practice which puts the transformed meaning to work in other contexts or cultural sites

Table 25.2 Model of critical literacy awareness

Move 1: teacher instruction	Move 2: student activities
<i>Situated practice</i>	<i>Critical framing</i> through seminar and panel discussions on related social and educational issues
<i>Overt instruction</i>	<i>Transformed practice</i> through critical reading and in-depth discussions

In the ‘student activities’ phase, it is expected that students are seen as dialogic partners in this learning encounter while they take part in showcasing their level of understanding and criticality in discussing and presenting ideas in relation to the assigned classroom task. One of the final aims of raising critical literacy awareness in this model is the hope that students will attain a certain level of autonomy as well as confidence after the directed classroom activity and progress to transformations in the way they perceive and discuss ideas, thoughts and discourses. The somewhat seamless learning activities carried out through the knowledge processes of ‘*critical framing and transformed practice*’ has the potential of helping learners build cognitive bridges by tapping into theories on the ideological notion of literacies. Koo (2008) argues that a situated critical literacy in education is needed in a multilingual and multicultural context like Malaysia so that postgraduate students from diverse culture and linguistic backgrounds are equipped to cope with diversity and differences in the intersections and conjunctures of various cultures in any context. She argues that students need to negotiate and make meanings between various similar and yet competing and/or contradictory cultural contexts such as those of school, home, family, work and community. As such, the CLA model has the potential of generating learners that are multicultural meaning makers when they tap into their lifeworlds and those of dominant systems and institutions.

25.2 Methodology

This study used a qualitative research design to collect data from 30 postgraduate students in MA taught courses in two public universities in Malaysia. For reasons of anonymity, the universities will be referred to as “University A” and “University B”. The MA students from “University A” were pursuing a Master’s degree in Linguistics and English Language Studies while the MA students from “University B” were pursuing a Master of Education degree. In “University A”, the MA classes were held on Tuesday evenings between 4:00 pm and 7:00 pm and comprised 18 full-time and part-time students. Meanwhile the MA class in “University B” was held on Monday evenings from 6.00 pm to 9.00 pm and comprised 15 full-time students.

The researchers collected data in Semester II (academic session 2012/2013) based on lessons conducted in the first 5 weeks of the semester with their intact MA classes. Two intact lectures of each MA course were audio-taped for analysis to keep track of student-teacher interactions (6 h of recording for each MA class). The researchers also conducted two focus group interviews with 12 students from both universities (6 students from “University A” and 6 students from “University B”) to glean their comments on the use of the CLA model in their MA class. Each focus group interview session lasted between 30 and 45 min.

Ethical considerations were adhered to in this study (for instance, actual student names were not used and data collected were used for research purposes only; a coding system was used – for the focus group interviews, students were assigned codes such as ‘S1: UniA’ to refer to ‘Student 1 from University A; for in-class interactions, students were labelled as “Student A, Student B” and so on). Students from

both universities signed student consent forms and expressed their willingness to participate in the study and had no objections to having two of their class lectures and focus group interviews audio recorded for research purposes. The focus group interviews were held during Week 6 of the semester as this gave students more opportunities to reflect on their thoughts and ideas in relation to the way their critical literacy awareness had developed after following 5 weeks of lectures and participating in related classroom activities and tasks. In both postgraduate classes, students had to take part in one group-based seminar and panel discussion on a social/educational topic selected by their group. This required them to access a range of journal articles from the fields of applied linguistics (students from "University A") and educational pedagogy (students from "University B"). Both the researchers are experienced lecturers (average university teaching experience of 22.5 years) and are familiar with the multiliteracies theory and the CLA model. Prior to the commencement of the MA courses, both researchers met to discuss their lesson activities over the 5 weeks in an effort to maintain task similarity so that cognitive and criticality elements were similar for both MA courses and comparisons pertaining to students' critical literacy awareness could be made even if the MA courses covered concepts and theories in the fields of applied linguistics and educational pedagogy.

In the study, both researchers used '*situated practice*' and '*overt instruction*' as their main knowledge processes when they covered topics in their respective MA class. For instance, the researcher in "University A" who taught a 3 unit course on "*Perspectives in English Language Studies: Literacy and Literature*" covered the following topics with her MA students in Weeks 1–5:

- Perspectives on literacy (definitions, knowledge and cognition, reading difficulties),
- Multiliteracies pedagogy (conceptual framework, designs for learning, the Multiliteracies Approach)
- Cognition and the development of reading (models of reading, balanced literacy approaches)
- Multimodality in educational contexts (using multiple technologies, engaging readers and writers, critical reading development).

After initial instruction from the lecturers on each topic area, the students completed classroom tasks labelled as 'student activities' in the CLA model used in this study. In "University A", the students worked on a group-based activity based on a list of panel/seminar presentation topics handed to them by the lecturer. Once the group had selected their topic, they worked collaboratively to develop their understanding of the selected topic by reading relevant journal articles, magazines and books. For instance, one group chose a topic on discussing 'current testing approaches used to assess ESL reading in various educational contexts'. This group then worked together to prepare a seminar presentation on the topic by adhering to the scope of the question and by presenting relevant information using a powerpoint presentation in front of the class. They also had to answer questions posed by their peers and lecturer concerning the scope, quality and content coverage of their presentation on the topic. In University B, the lecturer taught a 3-credit course on Instructional Leadership which explored the following topics: Instructional Leader,

Student Diversity, Student Abilities and Challenges, Learning, Teaching, Motivation, Classroom Management, Assessing Student Learning and Assessing and Changing School Culture and Climate. For the group presentation activity, one group chose to conduct a seminar presentation on “Teaching”. The students worked collaboratively to prepare a seminar presentation using a power point presentation which covered the following aspects: role of a teacher and whether they make a difference; the qualities of a good teacher; how to teach for understanding by focusing on the subject; outstanding teaching and developing a Teaching Portfolio. The group presentation was followed by a question-and-answer session; the questions were posed by both their peers and the lecturer.

In both universities, the lecturers encouraged students to read widely and critically on their topic by asking the following framework of questions suggested by Goodwyn and Stables (2004) that promote reading from a critical stance:

- (a) Do you agree with the author’s viewpoint?
- (b) What does the author/s want us to think?
- (c) Whose voices are missing, silenced or discounted in the text?
- (d) How might alternative perspectives be represented?
- (e) How would that contribute to your understanding of the text from a critical stance?
- (f) Would your viewpoint change on the basis of what you have learned?

The focus group interviews were carried out with students who volunteered to take part in the interviews. Due to time constraints and related logistical issues, the focus group interviews were conducted with 12 students who volunteered from each of the universities (6 students in each group). In each of the focus group sessions, students were asked to openly discuss the development of their critical literacy awareness and their reading repertoires based on the student activities conducted in their MA class. The time and venue of these interviews were decided based on mutual agreement between the researcher and the students (held in tutorial rooms at both universities). The interview sessions were audio taped and later transcribed for data analysis using emergent themes.

25.3 Findings and Discussion

In both universities, two intact MA classes were audio taped to record student-teacher interactions. Both lecturers used ‘*overt instruction*’ in the CLA model to explain concepts, arguments and ideas in their MA class. The first audio taped class aimed to look at the lecturers’ critical framing of the topic and were not entirely lecture-based. Both lecturers used powerpoint slides to teach their topic and invited students to comment on issues during the class. The recordings were for a 3 h class (with a 30 min break in between). The lecturer from “University A” was teaching a topic on the Multiliteracies pedagogy and conducted her lecture by explaining the concept of multiliteracies, the main tenets of the theory and the implications of using this pedagogy in a range of ESL and EFL educational contexts. She used

'*situated practice*' at the outset of the lecture to gauge students' experience and previous knowledge base; then she used '*overt instruction*' to explain the multiliteracies theory and pedagogy. She invited students to comment on their learning experience during their primary, secondary and tertiary years. Her lecture notes on the powerpoint slides contained visual stimulus to contextualise students' understanding of the multiliteracies theory, pedagogy and implications. The audio-taped class session contained sufficient examples of student-teacher interactions that captured student participation in the MA class.

The lecturer from "University B" was teaching a topic on *Assessing Student Learning*. She began her lesson by first explaining the importance of assessing student learning. Then she used '*situated practice*' as an instruction tool by posing the following questions to her class:

- What is the difference between evaluation, measurement and assessment?
- What is your understanding of norm and criterion referenced tests?

This was done to gauge students' experience and their previous knowledge base that could help her identify the take-off point for her class. Realising that not many of her postgraduate students had a clear understanding of assessment practices, she then used '*overt instruction*' to explain the concept of assessment and the differences between evaluation, measurement and assessment. Following this, she moved on to discuss the differences between norm and criterion referenced tests by providing examples. She also invited her students to comment on their classroom practices (as a majority of the students were practising teachers). She discussed at length with her students what test scores mean and made them aware of the dangers of high-stakes centralised testing. She conducted her class by using a powerpoint slide presentation, a video-clip from You-Tube (on the dangers of high-stakes testing) and distributed handouts of examples of norm and criterion referenced tests.

The second audio taped class covered two group seminar presentations on selected topics. This recording contained student group presentations, peer comments and related student-teacher interactions. Peer comments were encouraged after each group presentation and the lecturer also posed critical questions based on each group's presentation. There was evidence of '*critical framing*' and '*transformed practice*' after each group presentation as their peers posed questions that framed social and cultural teaching practices in a local and global context.

Findings from the audio taped sessions (12 h of recording) reveal that the two lecturers made a conscious effort to use localised examples to help their students understand the lecture content better. The lecturers used inclusive terms like 'our', 'we' and 'all of us' in their '*situated practice*' component of the CLA model. It is felt that such expressions invite students to give their input and views, as shown in the excerpts below:

Why do you think there is less use of technology in our schools? Some teachers complain that language labs in some urban and semi-urban schools are ill-equipped so much so teachers can't use technology to teach....meaning they can't make their students motivated to learn English during class. Do you think such comments are justified in our education systems? The present young generation are very tech-savvy, are they not? What are your experiences with this? Would anyone want to give their views on this aspect? (Lecturer, UniA)

Yes we all talk about smart assessment and on-line assessment— do you all see this happening in our Malaysian schools? Why is this not successful in our classrooms? Has anyone tried on-line assessment in their class? What are the pros and cons to on-line assessment? (Lecturer, UniB)

Well...the Malaysian government schools have recently adopted formative assessment. What are your views on this? What are some of the issues and challenges you are facing as practising teachers? Do you think the teachers are ready for this change? What must Instructional Leaders in school do to prepare for this paradigm change in assessment? (Lecturer, UniB)

Meanwhile, the student-teacher recordings show that students are eager to participate in the mini lectures because they seem to like the idea of the lecturers pausing to ask them focused questions. In both MA classes, the students did not need a lot of persuasion to take part in the '*critical framing*' stage of their learning encounter. As both lecturers are familiar with the CLA model they were using with their students, they were consciously posing questions throughout their MA class in an effort to engage students as they taught content of the topic. It has to be pointed out that in both MA classes, students have to read assigned reading tasks comprising relevant journal articles or chapters from books on related topics. The following is an excerpt from the class recording from University A:

Teacher: well....does anyone wish to comment on whether they would use the Multiliteracies approach in their classrooms? After understanding the approach, how well do you see it being implemented in our Malaysian classrooms?

Student A: Perhaps I can try Dr.

Teacher: Sure, go ahead.....I know you have extensive teaching experience right?

Student A: Yes, Dr. After teaching secondary students ...errr....I've taught Forms 1, 2 and 3 students for the past 11 years. My comment is this....I'm lucky I've taught in both town and '*kampung*' schools...so I can say, especially in town schools, this method of teaching will work.

Teacher: Why do you think it will work only in urban schools? Are you saying it won't work in rural schools?

Student A: You see Dr...in town schools, the students are more interested to learn English...when I was teaching in a rural school in Kedah...errr....my students don't like to learn English. My point is this.... for using the multiliteracies approach, you need better students right?

Teacher: I don't know if that should be the deciding factor. What do others think?

Student B: Dr, I don't think that it should be made a criterion at all....you see, if one understands the model, it can work in any context....

Student A: No,.... (*uses student's name*) I think you didn't get my point earlier...what I meant is in town schools, I can take my students to the lab to teach with powerpoint slides...their English is better....errr...they tend to come from better families....they are good in English.....I'm saying it's easier to try out the multiliteracies approach with them...because the students can understand where you are taking them....like Dr said, they are more tech-savvy.....even their handphones are better than my miserable old one
Class: (*laughter and agreement in class*).....Yes, we agree...many of our students are richer than us...ha ha

Student C: Ok, ok..shhh....my take on this issue is this..... it can work Dr...but to be practical....it will take a lot of effort on the teacher's part.

Teacher: What do you mean? In what sense?

Student C: Dr, these days, we teachers are so burdened with lesson planning and other paperwork. Preparing multiliteracies lessons seem to me...I mean it's my opinion.....I dunno about others...but for me ...errr, it's an interesting challenge....but too much time to prepare...but bottomline Dr, I think I can use it quite easily with my present Form 4 class

Student A: So you are saying it's time consuming....I agree on the surface...but I want to say it has potential....you know, my students...they'll jump up when I show them visuals on powerpoint...so they will like it.

The rest of the class recording continues with an engaged discussion among the students and the lecturer about the feasibility of using the multiliteracies pedagogy in Malaysian ESL classrooms. With the exception of a few students, most of them were active participants in the class and seemed happy to share their learning and teaching experiences (*situated practice*) and showed awareness of how in some instances the pedagogy would not work (*critical framing*). Having done their assigned reading on the theory, the students displayed understanding of the theory and its components (overt instruction by the lecturer).

In week 6, focus group interviews were held among 12 students from both universities to find out students' reactions to using the CLA model in their MA class. Below are some excerpts from the interview sessions:

As a Masters student, I think learning this way is novel for me. I like the idea because I really felt immersed, engaged....I especially like that you make us aware of what strategies to use in our 'student-activities' phase. It has never been easy for me to be critical on anything...really, I always think....others will be better than me...but now I feel I can learn to question other peoples' writing (S5: UniA)

It's a new way ...I like that you ask us so many questions. It's good...after all we're practicing teachers already. I think you're making us become more aware...it's a good feeling (S1: UniB)

really scary at first....but hey, I'm a Master student....so I tell myself...open yourself to new way of learning lah....Yes, I think it made me feel more serious in my learning. I think asking questions when I read made me involved, part of the class...like the questions given by you..it did help...not easy at first...but now I feel I can reflect more....you know.... on how teaching is done in our schools (S2: UniB)

Ah...so now I know how to be brave to question others...no more shy. I think I learn to be more responsible as a student. I think it's a good practiceto listen to others' ideas and then think about what are mine...how different or how same our ideas (S4: UniB)

Many other transcripts from the focus group interview session reflect similar growth in the learners' repertoires; ranging from being less shy to take part in class discussions, being more attentive and involved listeners while other students present their views, showing responsibility to develop further as autonomous learners, improving their reading ability, relying less on the dictionary to understand content of journal articles etc. While the 'student activities' in both the MA classes helped students to improve their '*critical framing*' and '*transformed practice*' abilities, a few students felt the CLA strategies did not help hone their 'transformed practice' dimension. This can be seen in some student excerpts below:

I still don't feel I have reached the 'transformed practice' stage...I know it is expected ... but I feel less sure of what this stage is and how I should grow in my knowledge base. I think I need to read critically to better understand this stage....I still need to improve (S2: UniA)

Maybe I still feel I don't have enough practice in evaluating my learning experience...I don't know Dr. I think I haven't been able to apply what I learned to real lifeI have always been a full-time student since my school years...maybe when I start working...maybe then I can see whether I can apply what I know and change things around me? (S1: UniA)

If you ask me, I think I need to think deeply about this...mostly, I am not using what I learn in my primary teaching....I know my students will like new ways of learning. Well...I need to reflect more I think....then think about how I can use it in my classroom teaching (S5: UniB)

For example...I don't know if I understand exactly what it means. Can I use it for other situations? I am really not sure....because I still feel lacking in something...maybe knowledge.....maybe not confident. But I know for sure, I feel some change in me as a learner..... just not sure how much I have improved (S3: UniB)

At the very least, these student perspectives of the 'transformed practice' stage indicate that students are aware of some conscious change in the way they are learning but not to the degree that they feel confident about applying knowledge in other ways. It has to be pointed out here that the CLA model does not follow a sequential move from one knowledge process to another and it does not treat the concept of literacy as an isolated practice. Students were informed that classroom discussions, interactions and practices are not disconnected from critical knowledge production; in fact, the CLA model offers students the possibilities of creating new knowledge and new ways of thinking and interacting with a range of texts.

25.4 Conclusion

Growing pressure to restructure and reform postgraduate education is encouraging "university academics to use innovative practices that assist students to develop 'employable' skills" (Dickie and Jay 2010: 29). Indeed, the CLA model is one of many innovative strategies made available to assist academics achieve quality learning outcomes among their students. The findings of this study show that the CLA model has good potential as a learning tool in today's higher education classrooms. The implications of the study suggest that university academics can utilise the CLA model in novel ways to in stil critical thinking and problem solving skills among their students. What is apparent from the audio taped recordings of the class interactions and students' views of the CLA model is that teachers play an important role in enhancing learning and engagement in the learning process. Student comments highlight that their lecturers possess a solid knowledge base as well as good teaching characteristics to make an impact in the learning encounter. In the context of encouraging critical literacy awareness among learners, it is not enough to only display academic discipline knowledge. The teacher using the CLA model needs to show competence in relating learning content to other local and global contexts as this helps to internationalise the curriculum as well as produce knowledgeable and empowered postgraduate students. The challenge for lecturers in the higher education context is to make critical literacy awareness a part of the pedagogical purpose so that students "may be empowered to make meanings as they learn to inhabit a critical space of learning, which may lead to a better and inclusive world for all" (Koo et al. 2012, p. 739).

References

- Behrman, H. E. (2006). Teaching about language, power and text: A review of classroom practices that support critical literacy. *Journal of Adolescent and Adult Literacy*, 49(6), 490–498.
- Dickie, C., & Jay, L. (2010). Innovation in postgraduate teaching: Mixed methods to enhance learning and learning about learning. *Higher Education Research & Development*, 29(1), 29–43.
- Goodwyn, A., & Stables, A. (2004). *Learning to read critically in language and literacy*. New York: Sage.
- Janes, D. (2009). *Designing multiliteracies curricula for various target learners*. Retrieved September 20, 2013, from <http://drofilm1.edublogs.org/artifacts-2/designing-multiliteracies-curricula-for-various-target-learners/>
- Kalantzis, M., & Cope, B. (2004). Designs for learning. *E-learning*, 1(1), 38–93.
- Kaur, S. (2013). Critical literacy practices of English majors in a tertiary institution. *GEMA Online Journal of Language Studies*, 13(2), 21–39.
- Kaur, S., Ganapathy, M., & Sidhu, G. K. (2012). Designing learning elements using the multiliteracies approach in an ESL writing classroom. *3L Language, Linguistics Literature: The Southeast Asian Journal of English Language Studies*, 18(3), 119–134.
- Kearney, M. L. (2008, March 5–7). *The role of postgraduate education in research systems*. Paper presented at the UNESCO/DCU workshop on 'Trends in Postgraduate Education', Dublin City University, Ireland.
- Koo, Y. L. (2008). *Language, culture and literacy: Meaning-making in global contexts*. Bangi: Universiti Kebangsaan Malaysia Press.
- Koo, Y. L., Wong, F. F., & Ismail, K. (2012). Students' critical consciousness through critical literacy awareness. *Gema Online® Journal of Language Studies*, 12(1), 727–143.
- Kress, G. (2003). *Literacy in the new media age*. New York: Routledge.
- Krish, P., Latif, H., & Zalina Mohd Lazim. (2012). Editorial: Interdisciplinary perspectives on culture, power and values: Language and literary studies in the local-global context. *Gema Online® Journal of Language Studies (Special Edition)*, 2, 339–341.
- Lesley, M. (2004). Looking for critical literacy with postbaccalaureate content area literacy students. *Journal of Adolescent & Adult Literacy*, 48(4), 320–334.
- McLaughlin, M., & DeVoogd, G. (2004). Critical literacy as comprehensions: Expanding reader response. *Journal of Adolescent & Adult Literacy*, 48, 52–56.
- Morshidi Sirat, P. A., Muniandy, B., Fazal M., Harshita A., Azman, H., Muhammad Kamarul Kabilan., & Ratna, R. A. R. (2008). The University curriculum and the employment of graduates. In Z. M. Don (Ed.), *Enhancing the quality of higher education through research: Shaping future policy* (p. 939). Kuala Lumpur: Ministry of Higher Education Malaysia, (MoHE).
- Nambiar, R. M. K. (2007). Enhancing academic literacy among tertiary learners: A Malaysian experience. *3L The Southeast Asian Journal of English Language Studies*, 13, 77–94.
- New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, 66(1), 60–92.
- Normazidah Che Musa, Koo, Y. L., & Azman, H. (2012). Exploring English language learning and teaching in Malaysia. *Gema Online® Journal of Language Studies*, 12(1), 35–51.
- Pescatore, C. (2007). High school students' instructional preferences when reading literary works of art. *The Reading Matrix*, 4(2), 97–118.
- Rosenblatt, L. M. (2004). The transactional theory of reading and writing. In R. B. Ruddel & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1363–1398). Newark: International Reading Association.

Chapter 26

The Impact of Reflective Inquiry on Professional Development of Student Teachers

Mohd Syazwan Wan Mahzan, Nabilah Abdullah,
and Nor Hairunnisa Mohammad Nor

Abstract Adequate guidance, constructive feedback and professional support during teaching practice can significantly change a mediocre student teacher to one who teaches more outstandingly. This study investigates the nature of supervisor support during reflective inquiry sessions, and how the support contributes to student teachers' professional growth as teachers-to-be. In-depth interviews with five student teachers provided data for the study. The findings revealed that the focus of reflections in the discussions between the student teachers and their supervisors revolved around the direction and implementation of the lesson; professional qualities; expressions of personal feelings, opinions and concerns; achievability of the pre-determined learning outcomes, student teachers' manifested behaviors; and other professional supports. Reflecting on the research participants' levels of reflectivity, 45 % interview entries were coded at level one -Technical Rationality (TR), 50 % at level two – Practical Action (PA), and 5 % at level three – Critical Reflection (CR). The findings also showed that the development of student teachers' self-efficacy beliefs in teaching was due to three contributing factors: the employment of reflective techniques by the supervisors, the value of accepting the strengths and weaknesses in teaching experienced by the trainees, and the applications of the outcomes gained during the reflective inquiry sessions on the upcoming lessons. These findings imply that supervisors must take reflective inquiry conferences more

M.S. Wan Mahzan (✉)

Sekolah Menengah Kebangsaan Chiku 2, 18300 Gua Musang, Kelantan, Malaysia

e-mail: ajanrasakse@gmail.com

N. Abdullah

Faculty of Education, Universiti Teknologi MARA, Section 17 Campus, 40200 Shah Alam, Selangor, Malaysia

e-mail: nabil789@salam.uitm.edu.my

N.H. Mohammad Nor

Academy of Language Studies, Universiti Teknologi MARA Kelantan, 16500 Machang, Kelantan, Malaysia

e-mail: hairunnisa1881@yahoo.com

seriously and recognize that productive sessions with their trainees are critical in developing future teachers with sound pedagogical know-how.

Keywords Reflective inquiry sessions • Focus of reflections • Levels of reflectivity • Professional development • Self-efficacy beliefs

26.1 Introduction

Universities and teacher training institutes in Malaysia are working hard towards the production of competent, proficient and enlightened teachers (Heng and Khim 2004). In addition to the emphasis on the mastery of content knowledge as well as considerable exposure to theoretical and practical aspects of pedagogy, progressive personal development of students towards becoming trained teachers is also centralized on the use of reflection during practicum. Reflection during teacher training process is commonly implemented via a number of mechanisms, namely mentor observation, supervisor observation, journal writing, portfolio keeping, self-evaluation and reflective inquiry.

A review of literature shows that most studies related to professional development of student teachers focused on in-depth explorations on reflective practice using journal writing and portfolio keeping. Very few studies were interested to investigate more on the application of reflective inquiry. Rubina (2004) contended that reflective inquiry can boost student teachers' moral to teach better and to open up their mind to be consistently conscious of "any issues related to their classroom behaviour" (p. 19). Anglea (2009) corroborated that reflective inquiry provides student teachers a sense of awareness about the different dimensions of teaching and learning.

Heng and Khim (2004) revealed the expected outcomes of supervision process for student teachers. They argued that a number of past literatures have documented the success of the supervision process to promote student teacher learning yet in most cases there are "indications (that) supervisors may not fully understand their roles and responsibilities within reflective contexts" (Heng and Khim 2004, p. 32). This sad state of affair is in tandem with the findings of earlier studies conducted by Borko and Mayfield (1995) as well as that by O'Donoghue and Brooker (1996), which highlighted the limited roles of supervisors resulting in trainee teachers' failure and lack of awareness of responsibilities in classroom. In addition, Boud and Walker's (1998) study on the use of reflective practicum towards the professional development of student teachers discovered that supervisors' lack of insights regarding the true meaning of reflective practice resulted in poor outcomes of the reflective practicum session.

Hence, it could be assumed that if the reflective inquiry sessions were to be conducted in an effective manner by the supervisors, the outcomes of reflective enquiry are twofold: realizing student teachers' supposed roles in a classroom and creating

positive reinforcement towards student teacher learning about teaching philosophy and practice. Nevertheless, past literatures and the researchers' own experiences regarding the downsides of reflective inquiry practice on student teachers had exhibited gaps that the researchers wished to investigate further and thus bring them to light. As such, the purpose of this research was to investigate the nature of supervisor support during reflective inquiry sessions, and how the support has contributed to student teachers' professional growth as teachers-to-be.

26.1.1 Objectives of Study

The aim of the study was to unfold the experience of student teachers when they underwent the supervision process during practicum. The specific objectives of the study are as follows:

1. to investigate the focus of reflections in the discussions held between student teachers and their respective supervisors;
2. to examine the extent to which the student teachers have managed to reflect in the reflective inquiry session conducted in terms of reflection level;
3. to investigate to what extent the reflective inquiry session has contributed to the student teachers' self-efficacy beliefs in terms of realizing their teaching strengths and weaknesses.

26.2 Review of Related Literature

26.2.1 Levels of Reflectivity

Van Manen (1977) proposed three levels of reflectivity in realizing educational actions and thus applying needed strategies to reach the expected outcomes. The ability to demonstrate the depth of reflectivity as prescribed can contribute to new paradigm of how educators perceive teaching and learning with a particular group of students and enhance their teaching repertoire. The three levels of reflectivity proposed by Van Manen are technical rationality (TR), practical action (PA) and critical reflection (CR). In order for these stages of reflectivity to be functional, he stipulated that the stages should occur in order whereby one could not be considered achieving the CR level until they have experienced the previous levels of reflectivity, PA and TR accordingly.

According to Van Manen (1977), technical rationality (TR) deals with issues concerning technical application of educational knowledge and basic curriculum principles such as the effectiveness of teacher's instruction and the relevancy of the syllabus to students' proficiency level. Once a teacher achieves TR level of reflectivity, he will move to the next level of reflectivity which is practical action (PA). Practical

action (PA), on the other hand, deals with the re-examination of practice that has been executed. A reflective practitioner who is at this stage of reflection is reasoning out the teaching approaches made and assessing their educational consequences specifically on the students' learning. The manifestation of reflection at this level can be achieved via a thorough analysis on how the goals are met. Measuring learning outcomes via students' responses and tasks assigned is a classic example on how PA level of reflectivity can be realized in classroom setting.

In spite of the depth of coverage that the aforementioned levels of reflectivity could offer, Van Manen (1977) claimed that a higher level of reflectivity is needed to understand the worth of such experiences and their beneficial impacts on educational curriculum. Here comes critical action (CR) into action. At this third and final level, teachers are reflecting on the worthiness of the knowledge to the students in terms of their ability to apply the previously learnt knowledge into the real contexts outside the classroom womb.

26.2.2 Focus of Reflection

Moon (2008) regarded facilitators as a part of learning environment of student teachers. Facilitators are naturally expected to understand how reflection works and how the outcomes of the process will affect the qualities of learning. She also emphasized that facilitators should be aware of the importance of reflection as a platform to enhance learning. As a matter of fact, she elaborated further the underlying purpose of reflection which is to make student teachers aware of how they can utilize the reflective techniques experienced during the reflective process to "upgrade their previous less organized but valid levels of knowledge and understanding" (p. 167).

In the hope of optimizing the effectiveness of reflective session, several insights on reflection were put forward by influential scholars as basis for facilitators to conduct an effective reflective session. Gibbs (as cited in Moon 2008, p. 167) constructed a set of guidelines for supervisors on proper ways of having conversation during reflective session:

- (i) A stage of description
 - Describing events
 - Looking for details
 - Comparing the experience with other experiences
- (ii) A stage of entailing judgment
 - Discussing the quality of experiences in terms of strengths and weaknesses or the best and worst parts of teaching
 - Questioning the relevancy of particular actions
- (iii) A stage of analysis
 - Deeper questioning of what happened and making sense of it

- Reasoning out why such behaviors manifested
- Frequent use of Why-questions

Source: Gibbs (as cited in Moon 2008, p. 167)

26.2.3 Self-Efficacy: The Ignition of Realizing What You Can Do

The fundamental of self-efficacy theory as defined by Bandura (1997) is “people’s beliefs in their capabilities to produce desired effects of their own actions” (p. 7). People have the flexibility to decide which set of behaviors to be manifested in the face of challenges yet to what extent the perseverance attitude has been directed to the chosen set of behaviors will determine one’s self-efficacy level. Dweck (2000) highlighted five effects of self-efficacy beliefs which he claimed had influenced the subjects of his study in terms of their professionally guided and self-guided behavioral change strategies, physical health as well as psychological adjustment and problems.

In recent decades, a number of seminal papers and subsequent ground-breaking studies on the effects of self-efficacy beliefs towards one’s professional development across all disciplines were written and published. The original terms for self-efficacy beliefs before it was commercialized by Albert Bandura in 1997 were “volition” and “will”. Early works related to this kind of perceived competence were from John Locke and William James (Skinner 1995). This has attracted interests from people in academia as theories of motivation (White 1959), achievement motivation (McClelland et al. 1953), social learning (Rotter 1966) and the famous psychological well-being theory (Skinner 1995) have begun establishing themselves in the literature world (Maddux 2009).

Nevertheless, in spite of the emerging theories appearing in the recent studies, the theory of perceived competence in the form of self-efficacy introduced by Bandura (1997) remains appealing to many academicians due to its comprehensiveness. Bandura (1997) claimed that self-efficacy is the beliefs of what we can do under specific constraints and circumstances (as cited in Maddux 2009, p. 4). Self-efficacy notion gives emphasis on one’s ability to coordinate and execute his or his skills in an organized way in the efforts to resolve pre-determined goals.

26.2.4 Reflective Inquiry Session for Professional Development

Winter (as cited in Moon 2008) viewed professional development as interrelated with the development of one’s self-awareness. Eraut (1994), while in agreement with Winter’s stand, was however more concerned with “the application of the

awareness for personal improvement” (p. 91). Eraut (1994) elaborated further that the ability to know how and when to use specific knowledge and skills, as well as the ability to find alternatives as a result of our limitation are also part of self-knowledge. Meanwhile, self-management refers to the process of using self-knowledge to carry out our expected roles as professionals and this process, in turn, results in the growth of our personal behaviour (Eraut 1994).

There is a connection between self-inquiry and critical thinking to assist teachers in making the best resolution for the best interest of their students (Farrel 2003). He argued that, the decision-making process experienced by teachers via the combination of both in reflection are more guided and directive rather than just from their mere intuitions.

Rubina (2004) had her own view on the roles of reflection towards the professional growth of student teachers. The view was developed based on her research entitled *Using the Reflective Approach in a Teaching Practicum* whereby she gathered the opinions of student teachers and lecturers of her faculty about the effects of reflective approach towards self-development. In the study, Rubina highlighted the effects of reflective sessions conducted by respective lecturers on the student teachers. The research participants, ESL student teachers, felt that reflection had provided them a sense of awareness about the different dimensions of teaching and learning. The session had boosted their moral to teach better and had opened up their minds to always become aware of “any issues related to their classroom behaviour” (Rubina 2004, p. 12). Other than that, the participants also stated that the sessions had made them aware of certain undesirable classroom behaviours that had been manifested as a result of their inadequate knowledge on how to apply second language theories into practice. Hence, such awareness has made them more selective in choosing appropriate teaching materials and approaches.

To conclude, student teachers who consistently engage themselves in reflective practice will experience changes in attitudes and awareness. Such changes enable them to have deeper understanding on the nature of their students’ learning, sharpen their decision-making skills, enhance the effectiveness of their teaching, nurture their self-efficacy beliefs to realize their strengths and weaknesses in teaching and eventually boost their confidence in teaching. All these will certainly contribute professionally to their growth as teachers.

26.3 Methodology

The study employed a qualitative design using interview as the primary means of data collection. Ten semi-structured questions were posed to “elicit descriptions of experience, behaviors, or activities” related to the reflective inquiry processes that the student teachers have gone through during their teaching practice and to “enquire the respondents’ goals, beliefs, attitudes and values” (Fraenkel and Wallen 2006, p. 37). Methodological triangulation in the form of lesson feedback observation forms was used to substantiate the data gained from the primary research instrument.

Five out of a total of 25 Teaching English as Second Language (TESL) undergraduate student teachers from a teacher education institute were purposively chosen as research participants. Selection of participants was carried out based on the criteria that they went through their teaching practice stint in schools, engaged in reflective inquiry process with their respective supervisors, possessed rich information regarding the subject matter being studied and lastly were accessible in terms of their readiness to open up during the data collection process.

26.4 Results

This section reports the findings obtained from the one-off interview sessions with five research participants and twenty lesson observation feedback forms written by their respective supervisors in response to the lessons carried out prior to the reflective inquiry sessions. All in all, the raw data were scrutinized and arranged accordingly into their respective recurring themes and sub-themes in such a way to draw answer for each research question of the study.

26.4.1 *Focus of Reflections in the Reflective Inquiry Sessions*

After synthesizing and integrating the verbatim transcriptions of the interview sessions with researchers' memos and coding notes on the interview transcriptions via constant comparison method, six emerging foci of reflections were discovered recurring in the three out of five interview transcriptions. These six foci of reflections are divided into two dimensions: technical and cognitive. Technical dimension revolves around the process and procedure while cognitive dimension deals with mental processing activities over a particular action, event or behaviour. Tables 26.1 and 26.2 provide brief descriptions on the utilization of the six foci of reflections that were used as a basis of discussion during the reflective inquiry sessions prior to and after the lesson observations:

26.4.2 *Reflection Levels Experienced by the Student Teachers*

In order to investigate reflection levels experienced by the research participants, responses from each interview question being posed during the interview sessions were closely scrutinized and systematically coded. Any event, experience and insight pertaining to the contents they had discussed with their supervisors during the reflective inquiry sessions that matched the criteria prescribed in Table 26.3 were coded as L1, L2 and L3 to respectively refer to the following levels of reflectivity:

Table 26.1 The description of the three recurring foci of reflections in reflective inquiry session based on technical dimension

No.	Focus of reflections (Main theme)	Sub-focus (Sub-theme)
Technical dimension		
1.	Expressing personal feelings, opinions and concerns	Independent reflection first before discussing selected issues related to the lesson
2.	Brainstorming and exchanging information on the behaviors	Clarification on the student teachers' strengths and weaknesses
3.	Providing professional supports via constructive comments	Making sense of all the comments and suggestions given
		Setting up expectation for the upcoming lessons via suggestive comments
		Give the student teacher ample freedom to make decisions and choose what is best for their students provided that the comments have been reasoned out their relevancy

Table 26.2 The description of the three recurring foci of reflections in reflective inquiry session based on cognitive dimension

No.	Focus of reflections (Main theme)	Sub-focus (Sub-theme)
Cognitive dimension		
1.	The focus and purpose of the lesson	Lesson planning
		Arrangement of the activities
		Amendment of the lesson
		Learning goals/learning outcomes/behavioural objectives
2.	Lesson implementation	Pace of the instruction
		Delivery of the lesson
		Classroom management
		Learners' engagement with the activities
		Achievement of the learning outcomes
		Linking up teaching and learning theories and approaches with the present practice
		Dealing with misbehaved students
		Selection of teaching contents
Suggestions of future activities		
3.	Professional qualities as a teacher	Teacher persona
		Voice quality
		Rapport with learners
		Consideration on learners' present needs and interests
		Values

Table 26.3 Three levels of reflectivity by Van Manen (1977)

Level	Description	Criteria
L1	Technical rationality (TR)	Student teacher is concerned with technical application of knowledge and basic curriculum principles
L2	Practical action (PA)	Student becomes more concerned with clarifying assumptions while addressing educational consequences
L3	Critical reflection (CR)	Student teacher is concerned with worth of knowledge without a personal bias

Table 26.4 Frequency distribution of the research participants’ levels of reflectivity during the reflective inquiry sessions

Subject (Pseudonym)	Frequency of coded entries according to Van Manen’s levels of reflectivity (1977)			Total frequency (for each subject)
	Technical rationality (Level 1)	Practical action (Level 2)	Critical reflection (Level 3)	
Hazril	8	13	1	23 (28 %)
Sufian	8	4	1	13 (16 %)
Mary	7	12	1	19 (23 %)
Kamal	6	3	0	9 (11 %)
Jane	8	9	1	18 (22 %)
Total frequency (for each level)	37 (45 %)	41 (50 %)	4 (5 %)	82

The analyzed data for each interview session was totaled up and the frequency for each level was calculated. Table 26.4 illustrates the frequency distribution of the levels of reflectivity experienced by the research participants during the pre and post observation reflective inquiry sessions:

With reference to the above table, 45 % of the interview entries were coded at level one which is Technical Rationality (TR) while 50 % of the coded interview entries were recorded at level two of reflectivity, Practical Action (PA). Only 4 interview entries which covered 5 % out of the total entries indicated reflection at level three, Critical Reflection (CR).

26.4.3 Contribution of Reflective Inquiry Session Towards the Development of Student Teachers’ Self-Efficacy

In investigating the outcome of the reflective inquiry session with regards to its contribution to the student teachers’ self-efficacy beliefs, cardinal aspects that are involved in the operationalization of self-efficacy beliefs as proposed by Barone et al. (1997) are used as basis to elaborate the motives behind the emerging themes. Three accounts related to supervision process during the reflective inquiry session

Table 26.5 The cognitive domains of reflection's foci and their respective reflective techniques

Focus of reflections (Cognitive dimension)	Reflective techniques
Expressing personal feelings, opinions and concerns	Independent reflection first before discussing selected issues related to the lesson
Brainstorming and exchanging information on the behaviors manifested by the student teacher and his/her students throughout the teaching and learning process	Clarification on the student teachers' strengths and weaknesses
Providing professional supports via constructive comments	Making sense of all the comments and suggestions given
	Setting up expectation for the upcoming lessons via suggestive comments
	Give the student teacher ample freedom to make decisions and choose what is best for their students provided that the comments have been reasoned out their relevancy

that had contributed to the growth of self-efficacy beliefs among the research participants were discovered.

The employment of reflective techniques by supervisors during reflective inquiry sessions has enabled the research participants to believe that they are independently able to reflect and have the "capabilities to organize and execute courses of action" appropriate to their students' proficiency levels, interests and needs (Dellinger 2001, p. 29). The foci of reflections related to cognitive dimension highlighted in Table 26.5 were the translations of the utilization of reflective techniques employed by the subjects' supervisors in facilitating reflective practice during pre and post observation reflective inquiry sessions. The techniques below had helped the supervisors concerned to gear the student teachers towards the improvements of specific domains in teaching and learning:

Next, the development of self-efficacy beliefs among the student teachers was manifested via the value of acceptance pertaining to their strengths and weaknesses in teaching. The student teachers were required by their supervisors to express their insights regarding lesson planning or lesson implementation during the reflective inquiry sessions. It was the first step towards materialization of acceptance value among the student teachers before their weaknesses and strengths were highlighted and brought into discussion.

The last account that contributed to the subjects' self-efficacy beliefs is the interrelation between insights gained during reflective inquiry sessions and their applications in the upcoming lessons. The series of constructive argument, regarding the outcomes of reflective session alone that had contributed to the growth of the subjects' self-efficacy beliefs were rather inconclusive if the outcomes were not processed by experience. As time went by, the research participants were continuously involved with the re-construction of previous knowledge. They renewed their past knowledge as they interacted with their students; facing attitudinal problems and teaching complexities. Surprisingly, they discovered that those glitches were very similar to the issues that had been discussed in previous reflective sessions.

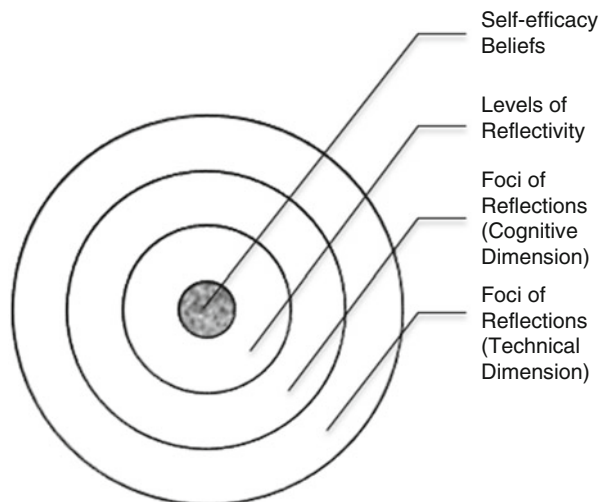
This was evident when both Hazril and Jane stated that their supervisor, Ms. Lucy, always reflected on the link between lessons and discussed possible activities for the upcoming lesson. Ms. Lucy indirectly established certain criteria that her supervisees needed to fulfil on the upcoming lesson. She wished to see some changes in terms of teaching behaviours and instructional delivery in relation to the comments issued previously.

26.5 Implications

Based on the findings of the study, it can be construed that the foci of reflections posed by the supervisors, levels of reflectivity of the research participants in response to matters be discussed in the reflective inquiry sessions and the development of the student teachers’ self-efficacy beliefs were all closely intertwined to each other during the reflective inquiry process. Figure 26.1 below gives a pictorial presentation on the interconnection between the variables of the study: the influence of the identified foci of reflections under technical dimension geared the supervisors to indulge the research participants with reflective cognitive processing activities and subsequently those reflective thinking processes were directed to achieve certain depths of reflectivity which contributed to the development of the research participants’ self-efficacy beliefs:

In other words, the ultimate aim (in the case of the bull’s eye of the diagram) of professional development of student teachers is to have sound self-efficacy beliefs. This could only be achieved if student teachers receive considerable exposure on the foci of reflections which fall under the technical and cognitive dimensions. Such exposure gears them to reflect their past behaviours and teaching activities in structured manner and attain certain levels of reflectivity as outlined by Van Manen

Fig. 26.1 The interconnection between the variables of the study



(1977). The accumulation of reflective experiences via these reflective thinking activities energizes the student teachers to nurture their self-efficacy beliefs in realizing their strengths and weaknesses in teaching. At this stage, the student teachers attain self-actualized state in which they believe in their abilities to give their students anything less than their best for the upcoming lessons.

Due to the significant influence that reflective inquiry session has in developing student teachers' professionalism, some drastic measures need to be implemented in order to revitalize the 'expected' roles of supervisors and student teachers and thus enhance the quality of student teacher learning. The suggestions are:

1. Supervisors

- must realize that they are responsible for carrying out the reflective sessions as best as possible so that student teachers can reap up the beneficial effects of the sessions,
- put forth all the foci of reflections, as outlined in this study, for discussion with their supervisors during the reflective sessions,
- should know that positive outcomes of the sessions can only be gained when student teachers are able to reap up the essence of learning and this can only be done when the student teachers are exposed to as many classroom issues as possible while engaging in reflective thinking activities,
- ought to create positive reflective inquiry sessions that encourage the value of openness from student teachers,
- outline the learning goals of reflective inquiry sessions in supportive manner so that positive outlooks of the sessions are created and,
- should make student teachers aware of how they could actually capitalize the foci of reflections they have experienced for individual reflections.

2. Student teachers

- should nurture self-efficacy beliefs during teaching practice so as to foster positive outlook towards the ups and downs in teaching and,
- need to realize that success does not come overnight as opposed to the essence of reflection.

26.6 Conclusion

This study has underlined the importance of reflective inquiry sessions towards the professional development of student teachers. While the depth of reflectivity during the sessions has always been pivotal in determining the quality of reflection, myriad foci of reflections remained prerequisite to enable certain depth of reflectivity be achieved. All in all, these two variables were directed to allow the student teachers develop a sense of self-efficacy beliefs, which include the ability to coordinate and execute skills and plans in an organized manner to achieve the desired goals. Ideally, it would be best if follow-up studies on the same research participants be carried out

once they have become full-fledged teachers to find out the extent to which they have been able to capitalize reflective inquiry outcomes gained during pre-service training into real-life teaching experiences. It would be interesting to see how these teachers strategize their reflective skills in dealing with all complexities in ESL instruction of our technologically savvy generation Z nowadays.

References

- Anglea, K. A. (2009). *Rediscovering purpose: The power of reflective inquiry as professional development*. Retrieved June 15, 2012, from Proquest Database.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Barone, D., Maddux, J. E., & Snyder, C. B. (1997). *Social cognitive psychology: History & current domains*. New York: Plenum.
- Borko, H., & Mayfield, V. (1995). The roles of the cooperating teacher and university supervisor in learning to teach. *Teaching and Teacher Education, 11*, 501–518.
- Boud, D., & Walker, D. (1998). *Promoting reflection in professional courses: The challenge of contexts* (Studies in higher education). London: Routledge.
- Dellinger, A. (2001). *A study of the measurement and sources of teachers' self and collective efficacy beliefs in professional learning environments*. Retrieved March 4, 2013, from Proquest Database.
- Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Taylor & Francis.
- Eraut, M. (1994). *Developing professional knowledge and competence*. London: Falmer Press.
- Farrel, T. (2003). Reflective teaching: Principles and practices. *English Teaching Forum, 41*(4), 14–21.
- Fraenkel, J. R., & Wallen, N. E. (2006). *How to design and evaluate research in education*. Boston: McGraw-Hill Higher Education.
- Heng, L. W., & Khim, T. S. (2004). *Reflective practice in Malaysia teacher education: Assumptions, practices and challenges*. Singapore: Marshall Cavendish Academic.
- Maddux, J. E. (2009). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology, 19*, 469–479.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.
- Moon, J. A. (2008). *Reflection in learning and professional development*. London/New York: Routledge Falmer Taylor & Francis Group.
- O'Donoghue, T. A., & Brooker, R. (1996). The rhetoric and reality of promoting reflective practice during practice teaching: An Australian case study. *Journal of Teacher Education, 47*(2). Proquest Journals Database.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, 609–611.
- Rubina, K. (2004). *Using the reflective approach in a teaching practicum*. Retrieved October 28, from http://www.melta.org.my/modules/tinycontent/Dos/rubina_khan.Pdf
- Skinner, E. A. (1995). *Perceived control, motivation, and coping*. Thousand Oaks: Sage.
- Van Manen, M. (1977). Linking ways of knowing with ways of being practical. *Curriculum Inquiry, 6*, 205–228. Retrieved August 10, 2012, from Procedia and Behavioral Sciences Database.
- White, R. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297–333.

Chapter 27

Supervisors' Written Feedback on Thesis Writing: Postgraduate Students' Perspectives and Concerns

Siti Hajar Aishah Mohd Azkah, Gurnam Kaur Sidhu,
and Shireena Basree Abdul Rahman

Abstract Failure to complete theses writing and problems related to supervision have been among the main reasons that contribute to high attrition and low completion rates among postgraduate students. In line with this, practice in research supervision; particularly in the aspect of supervisory feedback has been a crucial factor to ensure successful completion among the students. Therefore, this paper aims to investigate students' perspectives and concerns about supervisors' written feedback on thesis writing. This descriptive study involved 32 postgraduate students at a graduate school in the largest public university in Malaysia. Data were collected using a mixed-methods research design through the use of a questionnaire and semi-structured interviews. The results indicated written feedback as a sign that supervisors cared about the students' work and served as an evaluation of their strengths and limitations in writing. It was also found out that low quality and poor timing of feedback were among issues of concern. The findings of the study have implications for postgraduate thesis writing supervision, especially on written feedback.

Keywords Postgraduates • Postgraduate supervision • Thesis writing • Written feedback

27.1 Introduction

The globalization and internationalization have brought about global democratization and massification of education at all levels including higher education. Countries all around the world have seen a sharp increase in the demand for higher education leading the mushrooming of universities and number of postgraduate programmes.

S.H.A. Mohd Azkah (✉) • G.K. Sidhu • S.B. Abdul Rahman
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: cthajaraishah@gmail.com; gurnamsidhu@salam.uitm.edu.my;
shire417@salam.uitm.edu.my

This is deemed significant as the countries need to develop a critical mass of knowledge workers capable of functioning in today's keen competitive global markets. In line with this global trend, Malaysia too has embarked on an expansion of higher education through the launch of the National higher Education Strategic Plan (NHESP) Beyond 2020 and a program for financing postgraduate studies entitled MyBrain15. Through both NHESP and MyBrain 15, Malaysia aims to produce a critical mass of 60,000 PhD research based scholars by 2023. Nevertheless, to date, Malaysia has not been very successful in this effort due to the high attrition and low completion rates among the PhD candidates. A recent case study on MyBrain15 by Sidhu et al. (2013 – in press) in one Malaysian public university revealed the completion rate after 4 years stood at 5 % whilst another 10 % of the postgraduate students had been downgraded to doing masters. In addition, Affero Ismail et al. (2011) also reported that the postgraduate students took longer time to complete their study. They pointed out that based on data gathered by Graduate School of Studies in one Malaysian public university in 2005, PhD students completed their study within 4.84 years. It exceeds the usual Graduate on Time (GOT) period which is 4 years.

Failure to complete theses writing and problems related to supervision have been among the main reasons that contributed to this concern. A report from the Faculty of Hotel and Tourism Management, Universiti Teknologi MARA (UiTM) showed due to low thesis completion rates, only 30–40 % of postgraduate students managed to complete their study within stipulated time (Hamizad Abdul Hadi 2012). Although Hajibah Osman (2012) stated that problems such as students' limited language proficiency and weak academic writing skills were some of the main attributes to this apprehension, Lessing and Schulze (2002) highlighted that poor and inadequate supervision were also the main contributing factors. They further explained that inadequate knowledge and guidance skills of the supervisors, as well as low quality and frequency of feedback were found to be issues of concern among both postgraduate supervisors and students. Henceforth, practice in research supervision; particularly in the aspect of thesis writing has been one of the crucial factors (Sayed et al. 1998) that ensures successful completion of thesis among the students. Through the supervisors' feedback, the students are given guidance and opportunities to rewrite their research proposals and thesis chapters before submitting the final draft. Accordingly, an ability to provide constructive and regular feedback has become one of the most important criteria in choosing a doctoral supervisor in the social sciences (Zhao et al. 2007).

Supervisory feedback has been declared by several scholars as being able to provide great assistance to students in their thesis writing (e.g. Kumar and Stracke 2007; Wang and Li 2011). This is so because the students depend on their supervisors' feedback in the process of researching and writing up a thesis (Wang and Li 2009) as it replaces the type of instruction that other students normally get in lecture and classroom approaches (Bitchener et al. 2011). Thus, in postgraduate thesis writing, supervisors are said to be experts that provide opportunities for the students to move from their initial level of mastery to a more advanced level of writing within their Zone of Proximal Development (ZPD) with minimal support

(Yu and Lee 2013). Although the supervisors normally give both oral and written feedback on students' thesis writing, Yu and Lee (2013) claimed that written feedback constitutes a major form of instruction that helps the students to address specific writing problems in their theses. Hyland and Hyland (2006) further added that the written feedback contains heavy informational load that offers the assistance of an expert that guides them through their ZPD. Due to these reasons, Kumar and Stracke (2007) asserted that advanced academic training in writing was provided to the students through the supervisors' written feedback, particularly in identifying their strong and weak points (Stracke and Kumar 2010). In addition, the nature of the written feedback which is usually provided on the students' work-in-progress, such as research proposals and draft chapters (Wang and Li 2011) also allowed them to revise and rewrite the thesis before submitting the final draft. As a result, this feedback provides opportunities for the students to practise their writing skills through revision process, besides consolidating their learning journey from being novice writers to the experts (Kumar and Stracke 2011).

Regardless of how helpful feedback is in helping the students in their thesis writing, Wadesango and Machingambi (2011) asserted that the issue of feedback is highly problematic in the postgraduate supervision. Students claimed problems such as lack of prompt feedback, conflicting and inconsistent feedback, as well as unhelpful advice by the supervisors gave direct negative impact on the thesis completion and its quality (Wadesango and Machingambi 2011). At the same time, the written feedback that is too general or vague, lack of guidance and only focuses on negative aspects (Weaver 2006), as well as illegible handwritten feedback (Crossouard and Pryor 2009) were also found to be contributors to these problems. All of these issues have been a catalyst in the call for studies to take a critical look into the written feedback provided by the supervisors on the postgraduate students' thesis drafts. Presently, several studies (e.g. Kumar and Stracke 2007; Bitchener et al. 2011; Yu and Lee 2013) have been conducted to investigate the written feedback on thesis writing in the supervision of postgraduate students. However, these studies have only focused on the insights into the supervisors' written feedback (e.g. focus, types and the level of the written feedback's directness). To date, none of these studies have actually explored the postgraduate students' perspectives and challenges that they have faced regarding the written feedback on thesis writing. Moreover, most of these studies (e.g. Bitchener et al. 2011) have been conducted in the West and this points to the fact that there is scant empirical research on written feedback has been done in the local Malaysian public university context. Based on the concerns put forward by the postgraduate students, as well as limited empirical evidence regarding the written feedback provided on thesis writing by the supervisors in Malaysian public universities, this study is both timely and pertinent if Malaysia is to realize her aspiration of building a critical mass of knowledgeable human resource base of 60,000 PhD holders by 2023.

This paper will report the findings of a pilot study conducted on investigating postgraduate students' perceptions and concerns regarding written feedback provided by their supervisors on thesis writing in the Malaysian public university.

27.2 Method

The pilot study was conducted at a graduate school in the largest public university in Malaysia. Data were collected using a mixed-methods research design through the use of a questionnaire and semi-structured interviews. The target population comprised 32 social science postgraduate students and they were given pseudonyms as R1 until R32. To triangulate the findings, semi-structured interviews were conducted with 3 randomly selected students. They were referred as S1, S2 and S3.

The questionnaire used in this pilot study was adapted from Rowe and Wood (2008). It consisted of three sections; the first section (Section A) explored the demographic variables of the students whilst the second section (Section B) consisted of 6 items related to their perceptions regarding supervisors' written feedback on thesis writing. It used the Likert 5 point rating scale with the starting point of '1- Strongly Disagree', followed by '2- Disagree', '3- Almost Agree', '4- Agree' and the end point '5- Strongly Agree'. The last section (Section C) comprised two open ended questions that enabled the respondents to provide more explanations about their perceptions and concerns that they have faced regarding the supervisors' written feedback. The Cronbach's alpha reliability for the questionnaire was 0.706 ($\alpha = .706$) as shown in Table 27.1.

27.3 Results and Discussion

A total of 32 questionnaires were distributed in the study. The response rate stood at 100 % as all postgraduate students responded to the questionnaire. Out of the 32 respondents, a majority of them (24) were Masters students whereas the other 8 were Doctoral students. Most of them (24) had only one supervisor meanwhile all the doctoral students (8) had two supervisors. Their current stages in postgraduate study were reported in Table 27.2. A majority of them (37.5 %) had already completed

Table 27.1 Reliability index of questionnaire

Items	Cronbach's alpha
Perceptions of supervisors' written feedback (6 items)	.706

Table 27.2 Stages of postgraduate study (n=32)

Stages	Number of respondents/%
Writing of proposal	2 (6.3 %)
Literature review	2 (6.3 %)
Data collection	10 (31.3 %)
Data analysis	4 (12.5 %)
Reporting findings	2 (6.3 %)
Finished	12 (37.5 %)
Total	32 (100 %)

their postgraduate study whilst 31.3 % were collecting data for their theses. It was followed by 12.5 % who were analyzing data and 6.3 % who were in the stages of writing research proposal and literature review as well as reporting findings.

27.3.1 *Postgraduate Students' Perceptions About Supervisors' Written Feedback on Thesis Writing*

The postgraduate students' perceptions about supervisors' written feedback on thesis writing among respondents in this study were computed and reported in Table 27.3.

Based on the findings shown in Table 27.3, a majority of the respondents perceived written feedback as a sign that their supervisors cared about the work that they have done in thesis writing ($M=4.48$, $SD=.667$). Similar finding is reflected in interviews. Respondents S1 and S2 stated that they were aware about providing written feedback was not an easy task for their supervisors as their thesis drafts required many corrections. Their supervisors had to spend a lot of time as they needed to read their works in details. Due to these reasons, they explained that their written feedback showed that their supervisors actually read their works and cared to help them in improving their writing. Thus, they felt more encouraged and supported to keep on writing thesis, regardless of how difficult it was. This finding indicates that emotional support is indirectly provided to the students through the supervisor's written feedback. Accordingly, it can help them to feel more motivated in completing their theses as Ho et al. (2010) highlighted that when the students feel their supervisors are helpful and supportive, the experience of the supervision will be encouraging for them to overcome difficulties and complete their thesis writing. Such a view was also accentuated by Brew and Peseta (2004) who noted that supervisors who create positive feelings can assist their students to feel calm and see things more clearly and sharply, leading to effective learning.

Table 27.3 Postgraduate students' perceptions about supervisors' written feedback on thesis writing (n=32)

No.	Items	Mean	SD
1	When my supervisor gives me written feedback, it shows me that he/she cares about the work that I have done	4.48	.667
2	Written feedback is an evaluation of my strengths and limitation in thesis writing	4.42	.613
3	Written feedback tells me what I specifically need to do	4.39	.933
4	Receiving written feedback motivates me to improve my thesis writing	4.39	.658
5	Written feedback tells me what the expectations of my supervisor(s) are	4.15	.834
6	Receiving written feedback reduces my anxiety to improve my thesis writing	3.84	1.202

Scale: 1 = strongly disagree, 2 = disagree, 3 = almost agree, 4 = agree, 5 = strongly agree
SD Standard deviation

Besides that, the respondents also perceived the supervisors' written feedback as an evaluation of their strengths and limitations in thesis writing ($M=4.42$, $SD=.613$). They pointed out that positive feedbacks allowed them to know more about their strengths. On the other hand, negative feedbacks provided opportunities for them to find out about their limitations and try to improve them. They further explained that knowing both strengths and limitations helped them to become more competent, independent scholarly writers. Respondents R11, R14, R21 in the questionnaire as well as respondent S3 in the interview explained that they grew more aware of their strengths and limitations in writing when they referred to their supervisors' written feedback in revising their works. This knowledge later served as a guidance for them to improve their subsequent writings. As a result, the supervisors' written feedback indeed helps them to identify their strong and weak points from the revision process (Stracke and Kumar 2010). Adding to this statement, Kumar and Stracke (2011) further highlighted that the written feedback also allows the students to practise their writing skills and consolidate their learning journey from being novice writers to the experts.

In addition, the respondents also felt that the written feedback gave them opportunities to know what they specifically needed to do in their writing ($M=4.39$, $SD=.933$). Most of them, especially those who were in early stages of postgraduate study pointed out that they were rather clueless about conducting research and writing thesis. So, they depended on their supervisors' written feedback in getting clearer picture on the aspects that required improvement. Getting supervisors' written feedback was deemed as helpful in revising their written works. Respondent R30 who has finished her Masters stated that she was given specific directions starting from writing research proposal towards completing her thesis. The feedback facilitated her to become a better academic writer. All respondents in the interviews (S1, S2 and S3) who were in the middle of reporting their theses findings further added that they became more aware about the aspects that required improvements when they read their supervisors' written feedback. This is in line with Hyland and Hyland (2006) who posited that written feedback carries heavy information that offers the assistance of an expert, guiding the learners through their Zone of Proximal Development (ZPD) and provides them with developmental experiences as well as encourages them to be self-regulated learners (Kumar and Stracke 2011).

Apart from that, the respondents also perceived the written feedback as a motivation to improve their writing ($M=4.39$, $SD=.658$). Among the main reasons stated by the respondents are because the written feedback was given in formative format in which the focus was given on their desired achievement and current progress in writing. Respondents R8 and R24 in the questionnaire pointed out that they were motivated to improve their thesis writing because their supervisors did not solely focus on their mistakes. Instead, they were provided with clear guidance on how to write better in their consequent drafts. They were further supported by respondents S1 and S2 in the interviews who pointed out that their supervisors normally guided them on how to improve their writing in each draft. Hence, all of them felt more motivated and less anxious to finish their theses on time as the feedback allows

them to practise their writing skills through the revision process (Kumar and Stracke 2011). This is crucial as the postgraduate students need feedback that plays a role in helping them throughout their writing journey, instead of serving as summative judgments. For this reason, Hyland and Hyland (2006) stressed that feedback can no longer be used to only provide an evaluation of the students' final work. It ought to focus on their writing progress as well.

Additionally, the respondents also considered the written feedback as a means to discover their supervisors' expectations ($M=4.15$, $SD=.834$). Most of them stated that it was rather difficult to know about what their supervisors expected from them, especially in thesis writing. For instance, respondent R23 in the questionnaire claimed that she had problems to find out her supervisors' expectations due to unclear communication between them. She added that she was lucky that her supervisors provided clear written feedback. Thus, her supervisors' written feedback became a source of knowing the expectations. Likewise, all respondents in the interviews (S1, S2 and S3) also highlighted that they became more aware about their supervisors' expectations after reading their written feedback. For example, respondents S1 and S2 pointed out that their supervisors normally emphasized on the content as well as accuracy of language. On the other hand, respondent S3 stated that her supervisor paid more attention on the research methodology. Knowing all these indirectly informed all respondents in the interviews that their supervisors expected them to write well in those aspects. Accordingly, the supervisors were considered as experts that guided them as they moved from performing with assistance and later, accomplish more advanced level of writing with minimal support (Yu and Lee 2013). This is crucial in training them to become more independent scholarly writers as well as self-regulated learners.

Finally, the respondents felt that they were able to reduce their anxiety in improving thesis writing through their supervisors' written feedback ($M=3.84$, $SD=1.202$). A majority of them stated that they felt anxious about thesis writing due to limited understanding about the characteristics of the thesis genre and its component parts, as well as the expectations of their discipline-specific communities of practice. At the same time, they were also anxious about their ability in English writing. Thus, getting their supervisors' feedback helped them to feel more at ease. Respondent R18 in the questionnaire explained that although she was nervous, she felt better after getting specific guidance through her supervisors' written feedback. She was further supported by respondents S1 and S2 in the interviews who also claimed that their supervisors' feedback instilled confidence about their ability to finish writing on time. Therefore, they felt less anxious about the thesis writing. Nevertheless, respondents R18, S1 and S2 highlighted that it was crucial for the supervisors to give clear feedback, instead of solely questioning and underlining the students' thesis drafts. It was because vague feedback only caused the students to feel more intimidated and anxious as they did not know appropriate ways to improve their writing. As a consequence, the supervisors should try to avoid giving ambiguous feedback to their students as too general and lack of guidance (Weaver 2006) can give negative impact on the students' work.

27.3.2 *Postgraduate Students' Concerns About Supervisors' Written Feedback on Thesis Writing*

The postgraduate students' concerns about supervisors' written feedback on thesis writing among respondents in this study were shown in Table 27.4.

Based on findings in Table 27.4, the ambiguity of supervisors' written feedback can be viewed as one of the main concerns articulated by the respondents in this study. A total of 37.5 % of them believed that vague written feedback as unhelpful to improve their writing. Six respondents from the questionnaire (R4, R16, R21, R25, R27 and R30) pointed out that their supervisors normally provided too general and brief written feedback on their thesis drafts. Thus, it was rather difficult for them to do revision and rewrite their work. Moreover, some of the supervisors' written feedback was mainly in the form of question marks and underlined statements without any comments. As a consequence, the feedback became more confusing. It also did not help them to write better. Similar findings were also recorded by Weaver (2006). Students considered written feedback that was too general and lack of guidance as unhelpful for their writing assignments. Although the vagueness of the written feedback was found to have negative impact on the students' revision process in this study, Yu and Lee (2013) pointed out that in most cases; supervisors actually guided their students to accomplish more advanced level of writing. Therefore, they opted to provide minimal support as the developmental nature of the feedback allows the students to be self-regulated in becoming experts (Kumar and Stracke 2011).

Besides the written feedback's ambiguity, the illegibility of supervisors' handwriting has also been pointed out as another main concern in this study. Nearly 28 % of them asserted that it was hard or nearly impossible to read their supervisors' handwritten comments. As a result, they could not fully utilized the feedback to improve their writing. For instance, respondent R19 stressed that it was difficult to determine the areas of improvement in her thesis drafts as her supervisors' handwriting was indecipherable. This finding was found to be congruent with Crossouard and Pryor (2009) who claimed illegible handwritten comments as another factor that contributed to unhelpful aspect of the written feedback on the students' work. Nevertheless, the respondents stated that they took an initiative to ask for clarification and explanation during face-to-face meetings with their supervisors. For instance,

Table 27.4 Postgraduate students' concerns about supervisors' written feedback on thesis writing (n=32)

No	Items	Number of respondents/%
1	Vague written feedback	12 (37.5 %)
2	Illegible handwritten comments	9 (28.12 %)
3	Inconsistent written feedback	6 (18.75 %)
4	Poor timing of written feedback	5 (15.63 %)
	Total	32 (100 %)

respondent R17 stated that she could not only depend on the written feedback since her supervisors' handwriting was unreadable. Thus, she opted for oral feedback from her supervisor. Likewise, respondents from the interviews, S1 and S2 also preferred discussion after getting their supervisors' handwritten feedback. Wang and Li (2009) highlighted that interaction through the feedback provide opportunities for both supervisee and supervisor to clarify understandings and expectations, as well as negotiate meanings in their work.

In addition, another concern pointed out by the respondents in this study is the inconsistency of the supervisors' written feedback. Almost 19 % of the respondents stressed that they faced problems in rewriting their work due to the inconsistent feedback from their supervisors. For example, respondent R29 asserted that she was confused and frustrated when her supervisor highlighted different issues of improvement in different drafts. Her statement was further supported by respondent S3 in the interview. She claimed her supervisor tend to forget his feedback from the previous drafts and asked to her to do different corrections. On the other hand, respondent R28 who had two supervisors highlighted that it was difficult to do revisions as she was provided with two contradicting feedbacks. Similar like respondent R29, both respondents S3 and R28 were also confused. This finding indicates that conflicting and inconsistent feedback certainly have direct negative effect on the students' thesis completion (Wadesango and Machingambi 2011), although the written feedback constitutes a major form of instruction that helps them to address specific writing problems in their theses (Yu and Lee 2013).

The last concern articulated by the respondents in this study is related to the poor timing of their supervisors' written feedback. Nearly 16 % of them claimed that they did not get timely written feedback from their supervisors. Most of them mainly obtained their feedback after 2 weeks or more than a month. Respondent 25 in the questionnaire as well as respondents S1 and S2 from the interviews stressed that the delay in getting feedback negatively affected their revision process. Besides that, it also increased their anxiety about not being able to finish their theses on time. This finding shows that there is a need for the supervisors to give timely feedback to their students (Crossouard and Pryor 2009) in order to help them improve their written drafts and consequently, complete their thesis writing within stipulated time.

27.4 Conclusion

The main finding of the study revealed that supervisors' written feedback was considered as a sign that they cared about students' work. It shows that emotional support is indirectly provided to the students through the supervisor's written feedback. Thus, the supervisors do not only play a vital role as guides that provide expertise help to their students in research methodological matters and thesis writing, but more importantly, they act as pastors/therapists that give emotional and motivational support to them (Mouton 2001). Brew and Peseta (2004) emphasized that having supervisors who create positive feelings can assist the students to feel calm and

see things more clearly, leading to effective learning. All these can help the students to feel more motivated to finish their thesis writing on time. Besides that, this study also found out that the supervisors' written feedback served as an evaluation of the students' strengths and limitation in thesis writing, apart from providing information on specific aspects that they need to improve. Accordingly, the written feedback becomes an important tool for the supervisors when they act as quality controllers that provide critical constructive feedback as well as ensure their students' works meet the accepted standards for the academic theses (Mouton 2001). Kumar and Stracke (2011) further highlighted that "without the feedback, there is little impetus for the students to progress, to close the gap between current and desired performance, and to attain the level needed to become a member of the scholarly community". It proves the supervisors' ability to provide constructive and regular feedback is indeed crucial among the postgraduates in the social sciences (Zhao et al. 2007). Nevertheless, the supervisors ought to understand the students' current level of performance as well as their potential for future development. At the same time, issues such as ambiguity, inconsistency and illegibility of handwritten comments, as well as poor timing and frequency should also be taken into consideration in providing the written feedback. The awareness of these issues can help the supervisors in assisting the students to increasingly take control over their own learning as they become more independent scholarly writers. More importantly, it can help them to successfully finish writing their theses on time. The success of thesis writing will later contribute to higher completion rates among Malaysian postgraduates and this would increase the nations' number of PhD holders and its equivalent to 60,000 by 2023.

References

- Bitchener, J., Basturkmen, H., East, M., & Meyer, H. (2011). *Best practice in supervisor feedback to thesis students*. Wellington: AkoAotearoa.
- Brew, A., & Peseta, T. (2004). Changing postgraduate supervision practice: A program to encourage learning through evaluation and feedback. *Innovations in Education and Teaching International*, 41(1), 5–22.
- Crossouard, B., & Pryor, J. (2009). Using e-mail for formative assessment with professional doctorate students. *Assessment & Evaluation in Higher Education*, 34(4), 377–388.
- Hamizad Abdul Hadi. (2012). *Postgraduates' thesis accomplishment: Diagnosing its attributable*. Shah Alam: Universiti Teknologi MARA.
- Ho, J. C. W., Wong, L. C. J., & Wong, P. T. P. (2010). What helps and what hinders thesis completion: A critical incident study. *International Journal of Existential Psychology and Psychotherapy*, 3(2), 117–131.
- Hyland, K., & Hyland, F. (2006). Feedback on second language students' writing. *Language Teaching*, 39(2), 83–101.
- Ismail, A., Abiddin, N. Z., & Hassan, A. (2011). Improving the development of postgraduates' research and division. *International Education Studies*, 4(1), 78–89.
- Kumar, V., & Stracke, E. (2007). An analysis of written feedback on a PhD thesis. *Teaching in Higher Education*, 12(4), 461–470.

- Kumar, V., & Stracke, E. (2011). Examiners' reports on theses: Feedback or assessment? *Journal of English for Academic Purpose, 10*, 211–222.
- Lessing, A. C., & Schulze, S. (2002). Graduate supervision and academic support: Students' perceptions. *South African Journal of Higher Education, 16*(2), 139–149.
- Mouton, J. (2001). *How to succeed in your master's & doctoral studies?* Pretoria: Van Schaik.
- Osman, H. (2013). *Strategies for academic writing*. Shah Alam: UiTM Press.
- Rowe, A. D., & Wood, L. N. (2008). Student perceptions and preferences of feedback. *Asian Social Sciences, 4*(3), 78–88.
- Sayed, Y., Kruss, G., & Badat, S. (1998). Students' experience of postgraduate supervision at the University of the Western Cape. *Journal of Further and Higher Education, 22*(3), 275–285.
- Sidhu, G. K., Kaur, S., & Chan, Y. F. (2013). Postgraduate supervision: Attrition and completion rates: A case study. *Asian Journal of University Education, 9*(1) (in press).
- Stracke, E., & Kumar, V. (2010). Feedback and self-regulated learning. Insights from supervisors' and PhD examiners' reports. *Reflective Practice: International and Multidisciplinary Perspectives, 11*, 1.
- Wadesango, N., & Machingambi, S. (2011). Post graduate students' experiences with research supervisors. *Journal of Sociology and Social Anthropology, 2*(1), 31–37.
- Wang, T., & Li, L. Y. (2009). *International research students' experiences of feedback*. Paper presented at the 32nd HERDSA annual conference, Darwin, Australia.
- Wang, T., & Li, L. (2011). Tell me what to do' vs. 'guide me through it': Feedback experiences of international doctoral students. *Active Learning in Higher Education, 12*(2), 101–112.
- Weaver, M. R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment & Evaluation in Higher Education, 31*(3), 379–394.
- Yu, S., & Lee, I. (2013). Understanding supervisors' commentary practices in doctoral research proposal writing: A Hong Kong study. *The Asia-Pacific Education Researcher, 22*(4), 473–483.
- Zhao, C. M., Golde, C. M., & McCormick, A. C. (2007). More than a signature: How advisor choice and advisor behavior affect doctoral student satisfaction. *Journal of Further and Higher Education, 31*(3), 263–281.

Chapter 28

Factors Contributing to Students' Poor Performance in a Mathematics Preparatory Program

Parmjit Singh, Cheong Tau Han, Nurul Akmal Md Nasir,
Mohd Adlan Bin Ramly, and Teoh Sian Hoon

Abstract The quality of instructional design in teaching and learning of mathematics has been one of the major challenges and concerns of educators in any higher educational settings. Recognizing the eloquence of the factors affecting math achievement is particularly important for making the best design decisions. This study, utilizing a mix-method approach among 370 randomly selected students (from which 18 were selected for the interviews), was conducted to identify the factors affecting the math achievement of students involved in a college preparatory diploma program where we seek to answer the fundamental question “Is this Mathematics program working?” First, the findings poignantly revealed that students faced great difficulty in the fundamentals of arithmetic and pre algebra. Secondly, majority of the students encountered difficulties in solving word problems as compared to numerical problems in the Mathematics Achievement test. Thirdly, attitude towards mathematics was not an indicator in the seminal determination of student’s achievement in mathematics. Finally, the usage and over reliance of calculators among the students plays a role in inhibiting their development of the fundamentals of mathematics learning. In general, the findings surmise that this Mathematics preparatory program specially tailored for students on their pursuit towards diploma courses “is not working” as one would hope so. These students have significant gaps in their mathematical knowledge and it will become incomprehensible for them to move forward. Our concern is that this will inevitably lead to lowering the standards of our graduates for them to be successful. We need to improve the current mathematics program design but one need to note that there are no quick fixes for it.

Keywords Mathematics • Learning • Teaching • Exam • Weak students • Preparatory program

P. Singh (✉) • C.T. Han • N.A.M. Nasir • M.A.B. Ramly • T.S. Hoon
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: parmj378@salam.uitm.edu.my; cheongtauhan@salam.uitm.edu.my;
nurulakmal@salam.uitm.edu.my; mohdadlan@salam.uitm.edu.my;
teohsian@salam.uitm.edu.my

28.1 Introduction

The quality of teaching and learning mathematics in colleges has been one of the major challenges and concerns of educators in any mathematics program and this such conundrum is especially true for weak students when special programs are prepared for them as a preparatory courses to pursue their studies. The elucidation of such predicament has much been debated but the fundamental problems associated with the quality of teaching and learning in the field of mathematics has been known to be addressed by using Instructional Design (Andaya 2014; Saritas and Akdemir 2009; Sweller 1994). Such approach is highly effective especially due to its inquisitive nature that outlines key variables that affect the mathematical achievement in making well informed and researched decisions. The issue of fundamentally weak students at the college level had been discussed and thoroughly studied upon for the last four decades and the core problem to such poor achievement and feasible solutions are yet to be found or agreed upon by experts. One of the main discourses is to move the focus of the teaching and learning process through the amelioration of new instructional design methods that would ultimately produce fundamentally competent students who could master concepts and thus becoming versatile in solving problems. This idea however is easier said than done as learners' styles and nature differs greatly and so many elements like the surroundings, pedagogy and situational circumstance must be taken into consideration. Nevertheless, such challenges do not change the fact that a productive instructional approach must be developed to ensure the success of the students.

One is then inclined to ask one seminal question. What are the factors affecting weak students in the learning of mathematics? To begin with, many students entering the preparatory program have weak conceptual understanding of mathematics. This is further compounded with their weak mathematics skills. For these students', success in their program depends on many impending factors, including their ability and previous knowledge of the subject, the effectiveness of the instruction, and their motivation to work hard enough to succeed. Nevertheless, there seems to be a much more important issue that is deeply rooted in the mathematics education system. In discussing the content of college mathematics, it is important to firstly briefly discuss about school mathematics, as the transition from school mathematics to college mathematics is always a crucial matter especially in determining the quality of college students' experiences in constructing their knowledge based on their schemata in school. Evidence from a variety of sources makes it clear that many students are not learning the mathematics they need or are expected to learn (Heffer 2013; Parmjit and Hoon 2012; Lim and Idris 2006; Parmjit 2009) in schools. It has been no secret that the current notion of mathematics is based almost exclusively on formal mathematical procedures and concepts that, of their nature, are very remote from the conceptual world of the students who are to learn them (Steffee 1994). Heffer (2013) reported that students could use symbolism on algebra rules and is still completely oblivion to comprehending how the rules worked. A study by

Parmjit and White (2006) on college students found that the grades obtained in the examination mathematics did not indicate their mathematical knowledge in problem solving and majority of college freshmen have learnt how to do numerical computation at the expense of learning how to think and to unpack their mathematical content knowledge in a pedantic rigid manner. Without early intervention and successful practices, the students are lost to a revolving door of remedial programs – most of which we acknowledge as ineffective and inane. These interventions have not worked for over 20 years but we still continue to rely on them for the mathematical salvation of most of our struggling student population.

Student achievements in mathematics are also significantly affected by behavioral conditions which mainly translate into their attitude in learning. Given its reputation, the preconception that mathematics is predominantly a hard subject to learn might influence student achievements in class. In some cases, the appealing and dynamic content, coupled with inspirational instructors and lecturers intervention make a difference in student perception, causing the students to have a different attitude towards mathematics upon completing the course or program. Most importantly, the foundation of the literature outlines that the connection between attitude and achievement in mathematics learning is imminent and conclusively relational as the vast research in the past few decades indicated significant relationships between attitudes toward mathematics and achievement (Aiken 1974; Aiken 1976; Suydam 1984). However, current studies tend to show that there are more factors within attitude that affect students' achievement in mathematics. For example, Yee (2010) found in Singapore that many college students lack intrinsic motivation in learning mathematics despite the generally optimistic attitude towards mathematics. One feasible explanation is that these students are largely motivated by extrinsic motivation but the relation between such kind of motivation and successful learning is always deemed as weak making their optimism shaky and unstable.

Another prominent factor that affects mathematics learning is on the usage of calculators. Research (Plunkett 1979; Price et al. 2013) has shown that the excessive usage of calculators is a problem in today's classroom learning. One acknowledges that using a calculator to accurately divide 24.265 by 3.142 is essential but using it to divide 24 by 3 is just nonsensical as such calculations should have been instinctive and considered as a basic skill. Otherwise, how will one be able to tell if calculator's answer to the first question is even roughly correct? Researchers have shown that secondary school students and even college students tend to use calculators to multiply by 10. The contention here is that one must acknowledge that students will not be comfortable working with numbers unless they spend lots of time working with numbers instead of letting the calculators doing all the work. Given the fact that the usage of calculators is considered as an accepted norm in college settings, questions about the weak students involved in this preparatory program may no longer be avoided. Are the weak students able to solve problems, especially numerical problems without the aid of calculators? Does the usage of calculators inhibit their development in mathematics computations?.

28.2 Purpose of Study

As stated earlier, the quality of instructional design in teaching and learning of mathematics for weak students has been one of the major challenges and concerns and knowing the factors affecting math achievement is particularly important for making the best design decisions for them. Putting such conditions under great scrutiny and considerations, this study was conducted to identify the factors affecting the math achievement of students involved in a preparatory program for weak learners where we seek to answer the fundamental question “Is this Mathematics program working?” The research then is deemed to have tendencies to investigate students level of readiness, difficulties, issues and concerns faced by students in the learning of mathematics.

28.3 Objectives of Study

- (a) to determine students level of readiness in the learning of Mathematics in the preparatory courses for their Diploma program.
- (b) to investigate the difficulties faced by student in the learning of mathematics.
- (c) to identify probable factors that inhibits students’learning of mathematics..

28.4 Methodology

This study utilized a mix method approach in gathering the data from 370 randomly selected students’ involved in this preparatory program. Two sets of instrument, namely Mathematics Achievement Test (MAT) and a set of questionnaire were used to gather data for the quantitative component of this study while interviews were conducted for the qualitative perspective. The Achievement test consisted of 30 written mathematical tasks written in English. These questions were adapted from the PMR and SPM Malaysian Mathematics Curriculum Specification. The fundamental categories specifications of items in the test are Pre-Algebra, Algebra and College Algebra. The detail item specifications for the test are as shown in Tables 28.1 and 28.2 below.

Table 28.1 Categories

Criteria	Items	%	Total marks	% Marks
Pre algebra problem	19	63 %	40	63 %
Algebra problem	7	23 %	14	22 %
College algebra problem	4	13 %	9	15 %

Table 28.2 Item specifications

Criteria count	Count	%	Total marks	% Marks
No of word problems	14	47 %	31	49 %
No of numeric problems	16	53 %	32	51 %
No of PMR level problems	17	57 %	30	48 %
No of SPM level problems	13	43 %	33	52 %
No of HOTS problems	4	13 %	12	19 %
No of non-HOTS problems	26	87 %	51	81 %

The questionnaire on the other hand consists of six parts comprising demographic data; Students/Instructors attitude towards program; attitude towards learning mathematics; content of course; Students/Instructors perception towards the module and course materials; Instructors teaching methodology. The questions in the questionnaire were constructed based on a ten-point semantic scale and students took approximately 10 min to complete the questionnaire.

This was followed by interviews with 18 selected students in determining the factors and root causes of the difficulties faced in learning mathematics. These students were selected based on the performance categories (high, intermediate and low) in the Achievement test with six representatives from each category.

Data collected from both the quantitative and qualitative methodology provides a general picture of student's readiness in their content learning and their attitude towards this program especially from the perspective of mathematics learning.

28.5 Findings

28.5.1 Students Achievement in Mathematics

What is the level of students' achievement in the Mathematics Achievement Test (MAT)?

Table 28.3 shows that the mean score obtained by the students in the Mathematics Achievement Test is a low 12.96 with a standard deviation of 7.96 from a maximum score of 63. This simply indicates that these students have a low level of achievement (or ability) in mathematics. The distribution of these samples when categorized according to the achievement (in Table 28.4) illustrates that 80.5 % (n=298) of these students are in the lower achievers category as compared to 3.8 % (n=14) and 15.7 % (n=50) in the high and intermediate achievers categories respectively.

This data indicates that more than 95 % of the students involved in this study has a low level of achievement in mathematics.

What is the level of student's achievement in the Numeric and Non-Numeric (word problems) section of Mathematics Achievement Test?

Table 28.5 depicts that the mean score for the numerical problems and non numerical problems in the Mathematics Achievement Test are 9.89 (SD=5.27) and

Table 28.3 Students achievement in the Mathematics Achievement Test

	N	Min	Max	Mean	Std. deviation
Test score	370	.00	43.00	12.96	7.96

Max score: 63

Table 28.4 Achievement category based on mathematics achievement test

Category (%)	Frequency	Percentage
Low achievers	298	80.5
Intermediate achievers	50	15.7
High achievers	14	3.8

Scale:0–19: Low, 20–30: Intermediate, 31–43: High

Table 28.5 Achievement score in numerical problems and non numeric (word problems)

	N	Mean	Std. dev
Numerical problems score	370	9.89	5.27
Non numerical; (Word problems score)	370	3.08	3.74

Max Numeric score: 32, Max Word problem score: 31

3.08 (SD=3.74) respectively. In comparison with the maximum possible scores of 32 and 31 respectively for each, we can conclude that these students faced great difficulty in mathematics especially dealing in non- numerical (word problems) as compared to numerical problems.

28.5.2 Students Attitude Towards the Learning of Mathematics

What is the level of students' attitude towards the learning of mathematics?

Table 28.6 depicts that the overall mean score of 7.53 with a SD of 1.53 which indicates these students has a moderately high attitude towards the learning of mathematics.

28.5.3 Research Question 4

What is the level of students' satisfaction towards the organization and the clarity of the lectures teaching for this preparatory program?

Table 28.7 shows that the highest mean score obtained is for the item that '*the lecturer clearly explains the mathematical concepts in class*' with a mean of 8.40 (SD=1.74) while the lowest mean score is for the item that '*the lecturers display a comprehensive mastery on the course content*' with a mean of 8.19 (SD=1.80). In general, the other items range from a 8.22 to 8.28. The overall mean score of 8.28

Table 28.6 Attitude towards learning mathematics

	Mean	SD
Students overall attitude towards learning mathematics	7.53	1.53

Scale 1 (Low) to 10 (High)

Table 28.7 Organization and clarity of lectures

	Mean	SD
My instructors		
Set clear learning objectives	8.28	1.82
Display good content knowledge of the syllabus	8.19	1.80
Explain the concepts clearly	8.40	1.74
Teaching is conducted in a well pace manner	8.22	1.78
Overall	8.28	1.68

Scale 1 (Low) to 10 (High)

(SD= 1.68) simply means that these students are well satisfied with the instructors organization and clarity in teaching mathematics for this preparatory program.

28.5.4 *Descriptive Analysis of Factors Contributing to Students' Poor Performance in Mathematics*

The data collected to analyse the findings of this section were based on both the quantitative and qualitative approaches.

What are the factors that contributed to student's poor performance in the Mathematics Achievement test?

Based from the Mathematics Achievement test and interviews conducted with the students, four factors were determine as contributed to students poor performance in the Mathematics Achievement Test.

Firstly, most of the students faced difficulty in the fundamentals of arithmetic and pre algebra. Previous research on difficulties with the fundamentals of arithmetic has suggested that these errors often involve misconception and misapplication of prior knowledge. For example, adding across numerators and denominators (e.g. $\frac{3}{5} + \frac{4}{7} = \frac{7}{12}$) is a persistent error among these students. Additionally, these students sometimes find/keep equal denominators when multiplying two fractions. These students also faced difficulty in converting $7\frac{16}{2000}$ to decimal. The operation of divisions (on fractions) was the operator that caused them great difficulty as compared to the other three operators. These students also faced difficulties in using the BODMAS (bracket, operation of division, multiplication addition and subtraction) rule in a mathematical expression. For example when ask to evaluate: $-5[4 - (-3)(2)]$, approximately 27 % of the students obtained an incorrect solution.

Majority of these students has a weak foundation in pre-algebra. In an algebraic equation $\frac{4}{x-1} + \frac{3}{x} = 3$ proved a real discriminator between those who simply knew how to manipulate brackets and those who fully understood the more detailed approach needed to solve a fractional equation question. Majority of the incorrect approach was bringing the denominators up and expanding $4x + 3(x-1)$ and forgetting to deal with the right hand side of the equation appropriately when removing the fractions leading to $4x + 3(x-1) = 3$. Other example students faced difficulty was in simplifying a polynomial: $\frac{15x^2y - 45xy}{15y - 5xy}$. In this item, 93.8 % of the students obtained an incorrect solution.

Secondly, majority of the students faced difficulties in solving word problems as compared to numerical problems in the Mathematics Achievement test. The term ‘word problem’ is refer to mathematical exercise for students stated in a way that enhances awareness of the semantic structure of the problem in conjunction with the numerical representation. For example, “The perimeter of a rectangular plot of land is 510 m. Given the ratio of the length to width of the land is 12 to 5. Find the actual dimension (length and width) of the land.” Students faced difficulty in conceptualizing the term “ratio”.

Similarly in another example given, “The lowest temperature on Sunday morning was -8°C . Later that same day the temperature reached a high of 24°C . By how many degrees Celsius did the temperature increased? A sizeable number responded as $-8 + 16$. When probe, the difficulty faced was on the language comprehension of algebra.

Other examples, when probe further during the interviews that illustrate this difficulty:

- What is 4 less than x, majority stated as “4-x” rather than “x-4”*
- What is the quotient of x and 3, majority not able to comprehend the language.*
- What is the ratio of 9 more than x to x, majority not able to comprehend the term “ratio”.*
- What is the sum of three times a number and eight – erroneously responded as 3×8 as not able to comprehend the term “sum” and “three times a number” embedded in the question.*
- A number divided by the same number less five*

In short, this study suggests that the difficulty of students lies in understanding the algebraic language of the problems, rather than executing procedures.

Thirdly, there was an over reliance on the usage of calculators in computing problems. The usage of calculators inhibits the development of the basic arithmetic concept and skills of the students involve in the study. For an example in a question given:

Arrange the following numbers in ascending order. $\frac{2}{5}$; $\frac{1}{4}$; 26 %; 0.2; 20.4 %

Only 21 % of the students obtained a correct answer for this. When probe during the interviews, they faced difficulty in converting fraction ($\frac{2}{5}$ and $\frac{1}{4}$) into decimals.

They needed a calculator to convert these fractions. When asked, majority stated that it has been a while they compute with pen and paper and has been relying on calculator since entering college.

In another question given, *If $0.05x = 20$, find x*

Only 15.4 % of the students obtained a correct solution. During the interview, the difficulty faced was in dividing $20/0.05$ to obtain x and they were not able to compute without the aid of a calculator.

In another question: Evaluate: $\frac{1}{2} + \left(\frac{2}{3} \div \frac{4}{3}\right) - \left(\frac{4}{5} \times \frac{5}{6}\right)$, only 56.2 % obtained a correct solution and during the interviews, majority faced difficulty without the aid of a calculator. These students seemd to have “lost” the fundamentals of arithmetic in their mathematics learning.

28.6 Dicussion & Conclusion

The persistent problem in mathematics education at the college level is that many students entering the preparatory program have weak conceptual understanding of mathematics. This is further compounded with their weak mathematics skills. Most importantly, these students' success in the pre diploma program depends on many factors, including their ability and previous knowledge of the subject, the effectiveness of the instruction, and their motivation to work hard enough to succeed. For this paper, the focus was on investigating student's mastery level of mathematics and their attitude towards learning of mathematics. It was embarked to evaluate the Mathematics Preparatory program that seeks to answer the fundamental question “Is this Mathematics program working?”

Mastery level in mathematics. The findings revealed that these students have a low level of mastery on the fundamentals of mathematics, especially on the fundamentals' of arithmetic, pre algebra and algebra. A prominent and highly salient observation is that we believe that there is a close relationship between the fundamental arithmetic skills and mathematics achievement in general. In other words, the improvement in the fundamentals of basic arithmetic skills will undoubtedly result in improvement in mathematics achievement at a general level.

Another poignant factor was in students' inability in comprehending word problems as compared to numerical problems. It is essential for instructors to guide students to think about and analyze a word problem before making an attempt to solve it. This is because word problem is a situation which demands resolution and that there is no easy approach to solving it. The difficulties faced are also largely caused by their inability to comprehend the problem or question asked which deals with the language acquisition and communicative intelligibility. The data suggest that low level of the cognitive ability in thinking is an area that is definitely lacking among these students.

Students' attitude towards mathematics. Data obtained after analyzing students' responses on items soliciting their attitude towards mathematics indicate that they

have a moderately high attitude (7.53 with a SD of 1.53) towards the learning of mathematics. Similarly, the overall mean of 7.64 (SD= 1.75) indicates that the students involved in this study has a moderately high interest in embarking on this preparatory program. From the interviews, these students appreciate the chance accorded to them by the university in pursuing this program.

Usage of Calculators. The usage and over reliance of calculators among these students plays a role in inhibiting their development of the fundamentals of mathematics learning. We need to reduce or prohibit the usage of calculators for these students as this device inhibit students' basic mastery of the four arithmetic operations. Calculators can be a useful tool when used appropriately, but it is easy to get into the habit of reaching for one before you even think about what the question is asking. The reason that there is a debate about calculators and their usage is that many students in this program overuse their calculator, which leads them to underuse their brain and indirectly inhibits their arithmetic prowess.

The results revealed that these students have a low level of content knowledge attainment in mathematics based on the achievement test administered. For students especially weak in mathematics, the development of arithmetic and algebra (especially pre-algebra) is essential for the transition towards any mathematics courses at college level. Without these two fundamentals, students will face great difficulty in learning mathematics at the diploma level. However, the level of attitude towards the learning of mathematics was high. This indicates that attitude towards mathematics was not an indicator in determining student's achievement in mathematics. In general, the findings reveal that this Mathematics preparatory program specially tailored for weak students on their pursuit towards diploma programs "is not working" as one will hope so. These students have significant gaps in their mathematical knowledge and it will become impossible for them to move forward. Our concern is that this will inevitably lead to the lowering the standards of our graduates for them to be successful. Essentially, we need to improve the current mathematics program design but we need to note that there are no quick fixes for it.

The quality of teaching and learning in mathematics is a major challenge for educators especially when dealing with weak learners. There is pressure at all levels on educators to pass students who have not mastered concepts. Our concern is that the focus on higher education graduation rates is leading to a lowering of standards so that more students can be "successful." We want our students to graduate, but they must have the quantitative skills and knowledge to be successful in a highly competitive world. The salient task at hand is figuring out how students with different background, skills and ability can be fed with the conducive instructional environment, conditions, and methods. The answer to such mind boggling question is to ensure the creation of innovative instructional approaches and techniques.

Thus, it is important for educators to adopt instructional design techniques to attain higher achievement rates in mathematics (Rasmussen and Marrongelle 2006). Considering students' needs and comprehension of higher-order mathematical knowledge, instructional design should provide a systematic process and a framework for analytically planning, developing, and adapting mathematics instruction (Saritas and Akdemir 2009) especially for programs designed for weak students.

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References

- Aiken, L. R. (1974). Two scales of attitude toward mathematics. *Journal for Research in Mathematics Education*, 5, 67–71.
- Aiken, L. R. (1976). Update on attitudes and other affective variables in learning mathematics. *Review of Educational Research*, 46, 293–311.
- Andaya, O. (2014). Factors that affect mathematics achievement of students of Philippines Normal University. *Journal of Arts Science & Commerce*, 5(4), 83–91.
- Heeffner, A. (2013). Algebraic symbolism as a conceptual barrier in learning mathematics. In I. Maitre (Ed.), *Innovation and exemplary practices in mathematics education* (pp. 2–10). Thailand: Center for research in mathematics education, Khon Kaen University.
- Lim, H. L., & Idris, N. (2006). Assessing algebraic solving ability of Form Four students. *International Electronic Journal of Mathematics Education*, 1(1), 55–76.
- Parmjit, S. (2009). Variation in First Year College Students' understanding on their conceptions of and approaches to solving mathematical problems. *Asian Journal for University Learning and Teaching*, 5(1), 95–118.
- Parmjit, S., & Hoon, T. S. (2012). Gender differences in number sense and mental computations among secondary school students. In A. L. White & Ui Hock Cheah (Eds.), *Transforming school mathematics education in the 21st century* (pp. 282–297). Penang: Regional Center for Education in Science and Mathematics.
- Parmjit, S., & White, A. (2006). Unpacking first year university students' mathematical content knowledge through problem solving. *Asian Journal of University Education*, 1(1), 33–56.
- Plunkett, S. (1979). Decomposition and all that rot. *Mathematics in School*, 8(3), 2–5.
- Price, G. R., Mazzocco, M. M., & Ansari, D. (2013, January 2). Single digit arithmetic predicts high school math scores. *The Journal of Neuroscience*, 33(1), 156–163.
- Rasmussen, C., & Marrongelle, K. (2006). Pedagogical content tools: Integrating student reasoning and mathematics into instruction. *Journal for Research in Mathematics Education*, 37, 388–420.
- Saritas, T., & Akdemer, O. (2009). *Identifying factors affecting the mathematics achievement of students for better instructional design*. Retrieved November 9, 2014, from website: <http://www.itdi.org/Journal/article.html>
- Steffee, L. P. (1994). Children's multiplying scheme. In G. Harel & J. Confrey (Eds.), *The development of multiplicative reasoning in the learning of mathematics* (pp. 3–39). Albany: State University of New York Press.

- Suydam, M. N. (1984). Attitudes toward mathematics. *Arithmetic Teacher*, 32, 8–11.
- Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and Instruction*, 4, 295–312.
- Yee, L. S. (2010). Mathematics attitudes and achievement of Junior College Students in Singapore. In *Mathematics Education Research Group of Australasia*, Paper presented at the annual meeting of the Mathematics Education Research Group of Australasia, 33rd, Freemantle, Western Australia, 3–7 July 2010.

Chapter 29

Enhancing Malaysian Students' Learning with Interactive Multimedia and the Web: The MILE Project

Neo Mai, Heidi Tan Yeen-Ju, and Nordiana Ludin

Abstract The current shift from the traditional mode of learning to student-centred learning has created an impact on the content development and the delivery methodology in the instruction-learning process. There is a strong push by the Malaysian Government to develop creativity, communications skills, analytical and critical thinking, and problem-solving skills – skills that were significantly lacking in current graduates. As such, the prevailing research issue is the challenge in finding the most suitable combination of content and technology to enable students to acquire these skills and experiences. The MILE Project (funded by TM R&D) was developed to address this issue. This paper presents a research study that was conducted in the Faculty of Creative Multimedia, Multimedia University, Malaysia, to investigate Malaysian students' perceptions of using The MILE Project learning platform. Students engaged in problem-solving on design projects, collaborated on blogs and actively engaged in interactive multimedia content. Results showed that students displayed high levels of motivation and understanding, improved problem-solving skills and teamwork abilities, and were able to relate their acquired skills and experiences to the real-world. These results provided strong support for Malaysian educators to use pedagogically sound blended learning strategies in the classrooms to improve the teaching and learning process.

Keywords Multimedia • Student-centered • MILE • Malaysia • MMU • Problem-solving • Authentic learning

N. Mai (✉) • H.T. Yeen-Ju • N. Ludin
Faculty of Creative Multimedia, Multimedia University, Cyberjaya,
Selangor, 63100, Malaysia
e-mail: neo.mai@mmu.edu.my; yjtan@mmu.edu.my; dianaludin@gmail.com

29.1 Introduction

The infusion of Information Communication Technology (ICT) and, in particular, multimedia technology into education, has created a significant impact on the instructional content development and the methods of communicating information to the learners. It is leading to the evolution of new concepts and innovative teaching techniques in the instruction-learning process. This changing landscape of education focusses on learning, rather than on teaching and pedagogy, curriculum and instruction. It seeks to create a generation of learners who are able to organise information, critically analyse problems, and apply their concepts in meaningful and relevant ways, to encourage better student learning through the learning objectives of project-based learning or learning by doing, and to enable problem-solving, analysis, creativity and communication to take place in the classroom (Suh 2011; Garcia 2012). Currently, constructivist learning is becoming a dominant educational learning theory in education and multimedia technology has become an important component in enhancing the motivation and learning process of students (Hillis 2008; Guan 2009; Neo and Neo 2010, 2013). In addition to this, multimedia technology has been shown to affect students' motivation and self-esteem levels, as well as allow them to be creative and self-directed thinkers (Muller et al. 2008). Research on the mismatch of skills lacking in today's graduates, such as creativity, critical-thinking, problem-solving and communication skills (Tan et al. 2009), have resulted in many Malaysian classrooms using constructivism and multimedia to enhance the teaching and learning process.

The Malaysian Government, like many countries in the world, is giving strong support to using technology, particularly the Information and Communication Technology (ICT), in teaching and learning in the higher educational institutions (MOE 2008, 2012). In Malaysia, the traditional mode of learning is still being used in many institutions of learning. However, in the context of introducing technology and multimedia in learning, the Malaysian Government is echoing this learner-centred learning initiative with a call for Malaysian institutions of higher learning to integrate ICT into their classrooms (MOE 2008, 2012). Institutions of higher learning in Malaysia have begun to incorporate multimedia materials in problem-based learning and storytelling environments (Hong et al. 2003), in developing e-learning methods and inweb-based courses (Mahajan 2012; Neo 2013). However, despite the efforts to progress towards more student-centred methods of teaching and learning, Malaysian institutions of higher education still need to further study the use of constructivism and multimedia technology. As such, this paper seeks to further the investigation of constructivism and multimedia through the design and development of a technology-enhanced learning environment using multimedia as an instructional tool. The research objective of the study was developed to investigate students' perceptions of using a multimedia project within a constructivist-based learning environment and the impact of using a multimedia project, and provide results that would show that students were able to acquire skills integral to the meeting the demands of the workplace, such as collaborative and teamwork skills,

problem-solving, learning motivation, critical thinking and understanding of a topic area, and see the real-world relevance of their work. In particular the, study sought to answer the following research question: What were students' perceptions of an authentic and collaborative learning environment? In doing so, the MILE Project was developed to provide the learning platform that would enable this investigation to be carried out.

29.2 The Authentic and Collaborative Learning Environment – The MILE Project

Constructivism is defined as “*a place where learners may work together and support each other as they use a variety of tools and information resources in their pursuit of learning goals and problem-solving activities*” (Wilson 1995) and that learning is a personal interpretation of the world, where learners create interpretations of the world based on their past experience and interpretations (Herrington et al. 2014; Al-Huneidi and Schreurs 2013). In constructivism, the teacher is no longer perceived as the sole authority of the knowledge, but rather as the facilitator of learning, guiding and supporting learners in the process of constructing knowledge (Laurillard 2008) and provides the students with experiences that allow them to develop problem-solving, critical-thinking and creative skills, and apply them in a meaningful manner.

The learning activities in a constructivist learning environment call for students to become active participants in their own learning processes, learn to solve problems and work collaboratively. The learning environment is set in a meaningful, authentic context that allows for learner-centred activities to take place. These activities are social and collaborative in nature, where peers play an important role in encouraging the student's learning process and will expose students to multiple perspectives and solutions to their problems.

By working in a group situation, students will have to tap into their group skills and use a variety of activities to accomplish the project's overall objectives (McCarthy 2010). The group would be responsible for their goals and, thus, a collaborative learning experience can be gained. As such, constructivist learning environments are designed so that students will be able to become active participants in their learning process and develop skills that would allow them to think critically, function well as a member of a team, develop collaborative abilities and deepen their understanding of their task and improve student learning.

In addition, constructivist learning environments that incorporate authentic learning has been shown to equip students with crucial skills like higher order analysis and effective complex communication skills that would give them an upper hand when they assimilate themselves into the working world (Herrington and Kervin 2007, Herrington et al. 2010). Authentic learning enables students to learn in a way that “reflects the way knowledge will ultimately be used” by providing them with real-life affordances (Herrington et al. 2010). In addressing this issue,

Herrington and Kervin (2007) posited 9 principles of authentic learning which can effectively function as guidelines for developing an engaging learning environment for students. These principles suggest that the following be integrated:

1. **Authentic context**, providing students with context that reflects the way knowledge will be used in real life.
2. **Authentic activities**, providing students problem solving activities or tasks that are similar to those people do in the real world.
3. **Expert performance**, giving students access to expert thinking and performances, and allowing them to observe the task before it is attempted and to access the modeling of processes.
4. **Multiple roles and perspectives**, providing students with a wide exposure to various media and resources on the subject matter.
5. **Collaboration**, allowing students to collaborate with one another to solve problems and articulate what they have learnt.
6. **Reflection**, providing students the time reflect upon a broad base of knowledge to solve problems, and to predict, hypothesise, and experiment to produce a solution.
7. **Articulation**, ensuring that students have the opportunity to articulate, negotiate and defend their growing understanding.
8. **Coaching and scaffolding**, guiding and supporting of the student when necessary by the teacher.
9. **Integrated authentic assessment**, integrating formative assessments into the activities provided.

In creating authentic learning environments online, multimedia technologies provides an effective platform and technological support as authentic activities can be incorporated into online modules by using multimedia. To effectively provide an environment that would incorporate such pedagogies, The MILE Project was developed by The MILE Research Lab in the Faculty of Creative Multimedia, Multimedia University. MILE, or Multimedia Integrated Learning Environment, is an integrated student learning platform that was designed to facilitate a change in the educational landscape in Malaysia through a student-centred learning environment accessible in class, from their homes, and in support of the National Agenda. The platform consists of (1) interactive multimedia modules, The PILLARS, engaging students in the course content asynchronously, and (2) a web-log system, ORION, facilitating students working individually or in groups to communicate, reflect, and share their work. In MILE, a learning community can be created and maintained, both physically and virtually. The environment was developed predominantly with a student focus, and is suitable for both students and teachers. MILE platform seeks to secure student learning experiences and outcomes, and complements current universities' learning management systems (LMS). In MILE, students will not only have access to interactive multimedia learning materials 24/7, but can also engage in collaborative and reflective activities outside of the beyond the physical classrooms asynchronously.

29.3 Methodology

Herrington and Kervin's (2007) principles of authentic learning were combined with multimedia and web technologies in order to create a web-based authentic learning environment. This study was conducted with the participation of students from a digital media class in Multimedia University which students had to undertake as part of their undergraduate degree, for 14 study weeks, and was designed to equip them with a basic understanding of digital media and content creation. The sample comprised of 41 students, male and female, local and international students, from the Faculty of Management, Multimedia University. Herrington and Kervin's (2007) principles of authentic learning were combined with multimedia and web technologies to create a web-based authentic learning environment. The environment comprised of the following key components:

1. Interactive multimedia learning module based on the class curriculum.
2. Implementation of module content in the classroom and online for asynchronous access throughout the course
3. A problem-based activities built into the module for students to implement and reflect on their problem-solving skills

Convenient sampling methods were used to collect data for this quasi-experimental study. The study consisted of 41 students (N=41) taking the Interactive Multimedia class in the Multimedia University, from the Faculty of Management. Students were given both lectures (face-to-face and web-based) on topics pertaining to multimedia development, and lab tutorials once a week on Adobe Flash and Dreamweaver. The class was also told to imagine themselves as employees of a multimedia development company and given the task to design a cutting edge online magazine for client. This project was authentic and relevant to the students as they were going to be interviewing for internship placements in real multimedia firms in the Malaysian SuperCorridor (MSC) in the next year. The theme of the class project was "Online magazine" and the entire class had to decide and determine the overall monthly online magazine to be created. Students then divided themselves into groups of 5 to develop a section of the magazine. The section would be a fully interactive multimedia application created using Adobe Flash, and each member would be responsible for at least one part of the application. This was to prevent any "piggybacking" in the group, as well to ensure that each member would use their Flash skills which they were taught in their tutorial classes. Herrington and Kervin's (2007) authentic learning strategies were adapted and incorporated into this learning environment in both the online web modules as well as in the classroom. Students were given 14 weeks to complete the project. Figure 29.1 shows the student learning environment.

An interactive multimedia module based on the class curriculum titled "*Authoring Multimedia*" was created as part of the study and placed in an asynchronous

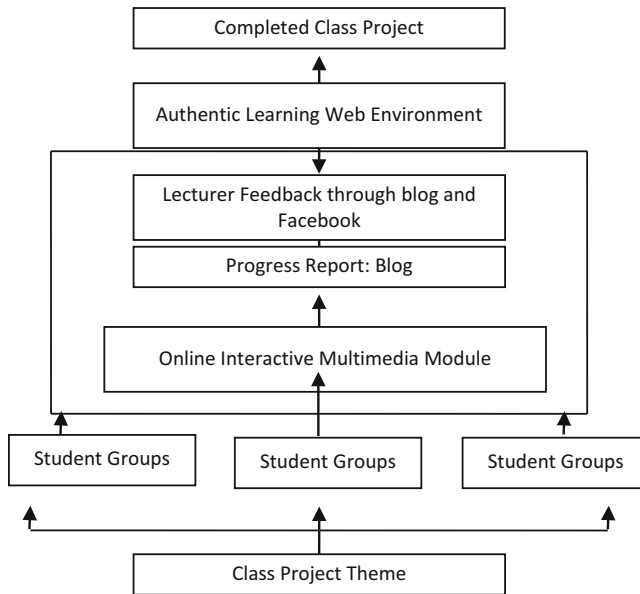


Fig. 29.1 The student learning environment

Table 29.1 Paired samples t-test results

	Paired differences					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. error mean	95 % confidence interval of the difference				
				Lower	Upper			
Pretest-posttest	-3.29	2.657	.415	-4.131	-2.454	-7.934	40	.000

Web-based learning environment and incorporated authentic learning principles as shown in Table 29.1. Even with the introduction of interactive web modules, the class was conducted in a blended manner where students had to attend face-to-face lecture sessions with the lecturer, use the online modules and engage in online discussions. Students would access the web module online a week before attending the lecture class and proceed to have in-class discussions with the lecturer. Figures 29.2 and 29.3 are examples of the design of the module to incorporate authentic learning principles as posited by Herrington and Kervin (2007).

In addition to learning asynchronously with interactive multimedia modules, students would also blog about their progress in their project. The system’s blogging section, Orion, allowed students to upload work-in-progress images and reflective notations of their work throughout the semester. These blogs would serve as material for them to reflect upon and make any necessary improvements, and is collaborative

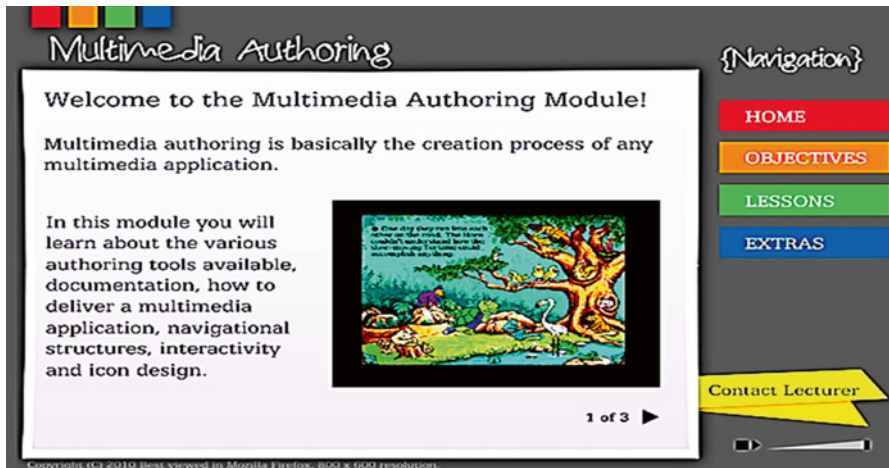


Fig. 29.2 The module's interface



Fig. 29.3 Incorporating authentic principles into the module

in nature. In other words, student groups could meet online to discuss their work and progress, exchange ideas and information among each other, and share their entries with other group members. The system also allowed the lecturer asynchronous access to their work and enabled them to make comments on their work, all of which is consistent with the Herrington and Kervin's (2007) authentic learning principles. Figures 29.4 and 29.5 are examples of student blogs from the study.



Fig. 29.4 One student group member blogging about their work in Orion

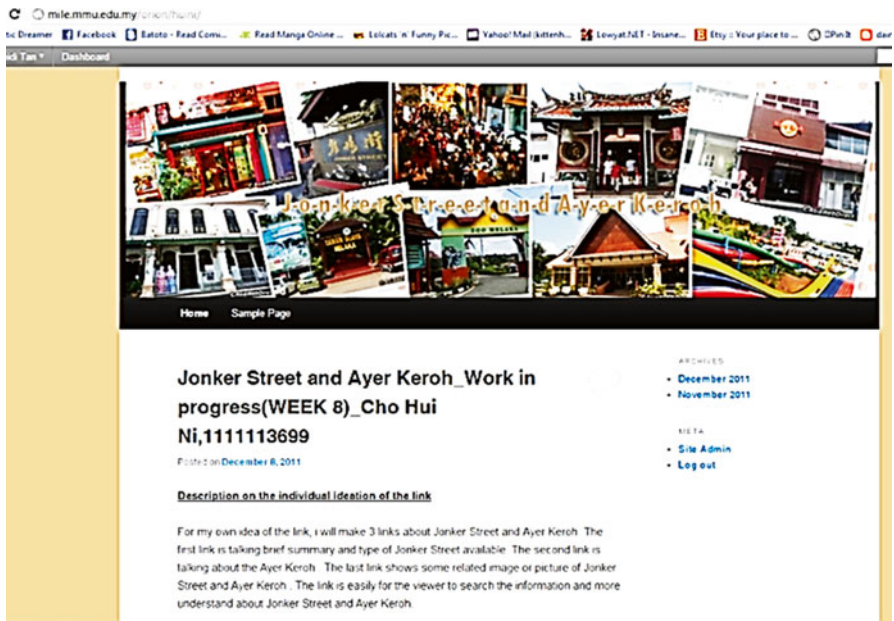


Fig. 29.5 Another student member blogging about their work in Orion

The study employed a mixed mode method of data collection and a triangulation of results based on pre- and post-tests, to measure their learning outcomes, surveys to gauge student perceptions, and student comments to solicit richer responses. The pre-and post tests were based on the content of the module, and the survey questionnaires were developed based on literature (Alessi and Trollip 2001; Herrington et al. 2014).

29.4 Analysis and Results

Students were given a pretest and posttest based on what was taught in the modules as a means to gauge their level of comprehension. Students were given the pretest before they could access the modules, whilst the post test was given after the students had been allotted a few weeks to access and view the modules. The pretest and posttest had the same set of questions which were randomized to avoid the 'memory effect'. The results of the pretest and posttest are shown in Table 29.1. The results show that the students scored a higher mean ($m=12.29$) in the posttest compared to the pretest ($m=9.0$). Further analysis through a paired sampled t-test showed that the difference of 3.29 was statistically significant at $p<0.05$. This is a clear indication that the students have indeed made significant progress in their learning outcomes after using the interactive online module.

Students were also given a survey to gauge their attitudes and perceptions about the learning environment and module. The survey was measured using a 5-point Likert Scale which begins with Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4) and Strongly Agree (5), and the items. The data were analyzed using SPSS (Statistical Package for Social Sciences) version 11.0, and yielded a Cronbach Alpha coefficient of 0.974. The survey was conducted to gauge students on the learning environment and their problem-solving skills. Analysis on the survey items showed that the overall average means and percentages of responses towards these areas were highly favourable (i.e., students responding 'Agree' or 'Strongly Agree' in the scale). Table 29.2 shows the results of the survey. Items in the table show responses that were towards the "Agree" and "Strongly Agree" parts of the Likert scale, their standard deviation and percentages of student responses that were positive and favourable.

From the results in Table 29.2, all the items scored above 3 on the scale. Therefore, it can be seen that the students had highly favourable responses towards having learning content with multimedia and the authenticity of the content for them to relate to real-world situations. In terms of increased involvement with the learning content, 93 % of the students reported favourably that they liked the use of multimedia as part of their learning of the topic ($m=4.32$) and in illustrating the content's concepts ($m=4.24$ with 88 % favourable responses), and that multimedia has helped them gain better understanding of the topics ($m=4.12$ with 83 % favourable responses). This is supported by their comments, "*I learnt more using this module through the multimedia elements*", "*The content and activities help me to under-*

Table 29.2 Survey results (ranked)

No	(N=41, Cronbach Alpha=0.974)	Mean (m)	Std dev.	% of favourable responses
1	Overall preference for module	4.34	.728	90.2
2	Multimedia as a learning tool	4.32	.687	92.7
3	Relevance to real-world situations	4.29	.680	92.7
4	Multimedia as a tool to illustrate concepts	4.24	.734	87.8
5	Authenticity of activities in the module	4.22	.613	90.2
6	Enjoyment	4.17	.771	90.2
7	Increase motivation	4.12	.748	82.9
8	Increased understanding	4.12	.748	82.9
9	Increased reflection	4.02	.790	80.5
10	Application to real-life situations	3.80	.749	65.9

stand stage by stage of the learning process of the topic”, and, “...the direct links and some video examples make me easier to understand the topic”.

In terms of the authenticity of the module, 66 % of students reported favourably that they can apply what they learned from the module in real life ($m=3.80$). They also felt that the content in the Web module was authentic and relevant to their learning ($m=4.22$, with 90.2 % favourable responses), and allowed them to see the relevance of what they were learning to real-world situations ($m=4.29$ with 93 % favourable responses), which were supported by their comments, *“It has helped me because I not only get to learn the theoretical part of this subject, I also get ideas from the module of how I can implement them practically.”* 81 % of them were also very positive about the blogging system, Orion, as it allowed them the opportunity to reflect upon their work and make the necessary improvements ($m=4.02$).

In addition, as a learning platform, 83 % of students reported favourably that they enjoyed learning and interacting with it ($m=4.17$) and found it motivating to learn with ($m=4.12$), and 90.2 % of students preferred this style of learning overall ($m=4.34$), the highest ranked item in the survey data analysed. These results were further supported by students’ comments in open-ended questions, which included, *“With the web module it save my time a lot rather than reading the boring power-point slides”, “Really good, because I actually read it and did not get bored!”* and, *“It make me understand better.”*

29.5 Conclusion

The results of this study show that using Herrington and Kervin’s (2007) authentic learning principles allowed students to see the relevancy of the topics. From the outcome of the class project and the results of the survey, students reported being confident in applying what they learnt from the module in real-life. This illustrates that the students were able to critically access what was being taught and found a connection to using the knowledge and solving problems in their future work. This

is in line with Herrington et al. (2010) suggestion that using authentic elements in a learning environment would imbue critical learning skills essential to students when they graduate.

The Pillars was effective in increasing engagement by the students with their learning content. Multimedia was a motivating component in engaging students in the contents of the module and consequently in their learning process. Presenting the information using a variety of media elements made the learning fun, enjoyable, and motivating for them, and this showed encouraging support for educators to use multimedia and interactivity to represent their educational content. Students felt motivated and encouraged to explore the topic when they were learning in a Web environment, and this supported Muller et al.'s (2008) view that learning technologies can be utilized as a tool to motivate students' learning explorations, and thus allowing students to become active learners and be more engaged in their learning process. Technology also allowed students to become researchers and authors of their learning. The Web was used to search for more information about the topics of choice. Students were able to explore the existing websites on their chosen topic and critically and creative analyse them for more innovative approaches.

Blogging in Orion was also an effective learning process as students, through reflection, sharing and collaboration, were able to improve on their work and make necessary changes. It also allowed them to look back on their learning path and improve upon it, supporting the Constructive learning approaches to teaching and learning (Herrington et al. 2014; McCarthy 2010).

Therefore, authentic learning has been shown to be effective in enabling students to learn and become more involved with their learning. This study has shown that it is important to take into further consideration the aspect of looking at authentic learning principles outlined by Herrington and Kervin (2007) as the underlying pedagogy for creating and designing of these online teaching and learning environments. In addition to that, the MILE system was also effective in improving students' learning outcomes via interacting with multimedia modules (The Pillars). Students' productivity and learning outcomes were also enhanced, through their reflective and collaborative activities on Orion, allowing them to build upon their knowledge and increasing their understanding of not only the subject matter, but also of their learning processes.

Overall, the MILE was able to provide students with a holistic way of learning them through (1) Cognitive stimulation via multimedia learning content, (2) Technical skills through the use of multimedia and web tools, (3) Social networking abilities through blogging activities on Orion, and (4) Affective experiences, where students reported enjoyment and fun in their learning process. Careful considerations can easily help blend each technological tool harmoniously together to create an environment in which students actively learn, explore and gain valuable skills on real-world problem solving, and pave way for better educational practices to be developed. These positive responses shown by the students in this study give very encouraging support to Malaysian educators to move away from curriculum-based teaching to a more authentic learning environment with real-life examples and problem-solving activities that would engage their students and motivate them to learn.

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References

- Alessi, S. M., & Trollip, S. R. (2001). *Multimedia for learning: Methods and development* (3rd ed.). Boston: Allyn & Bacon.
- Al-Huneidi, A., & Schreurs, J. (2013). Constructivism based blended learning in higher education. In *Information systems, e-learning, and knowledge management research* (pp. 581–591). Berlin/Heidelberg: Springer.
- Garcia, P. G. (2012). Collaborative learning activities in online courses: Issues and strategies. *ASEAN Journal of Open Distance Learning*, 4(1), 1–16.
- Guan, Y. H. (2009). A study on the learning efficiency of multimedia-presented, computer-based science information. *Educational Technology & Society*, 12(1), 62–72.
- Herrington, J., & Kervin, L. (2007). Authentic learning supported by technology: 10 suggestions and cases of integration in classrooms. *Educational Media International*, 44(3), 219–236.
- Herrington, J., Reeves, T. C., & Oliver, R. (2010). *A guide to authentic e-learning*. New York: Routledge Publishing.
- Herrington, J., Reeves, T. C., & Oliver, R. (2014). *Authentic learning environments*. New York: Springer.
- Hillis, P. (2008). Authentic learning and multimedia in history education. *Learning, Media and Technology*, 33(2), 87–99.
- Hong, K. S., Lai, K. W., & Holton, D. (2003). Students' satisfaction and perceived learning with a web-based course. *Educational Technology & Society*, 1, 116–124.
- Laurillard, D. M. (2008). The teacher as action researcher: Using technology to capture pedagogic form. *Studies in Higher Education*, 33(2), 139–154.
- Mahajan, G. (2012). Multimedia in teacher education: Perceptions & uses. *Journal of Education and Practice*, 3(1), 5–12.
- Malaysia Ministry of Education (MOE). (2008). *National report: Education in Malaysia*. Malaysia: Ministry of Education.
- Malaysia Ministry of Education (MOE). (2012). *National education policy*. Malaysia: Ministry of Education.
- McCarthy, J. (2010). Blended learning environments: Using social networking sites to enhance the first year experience. *Australasian Journal of Educational Technology*, 26(6), 729–740.
- Muller, D. A., Lee, K., & Sharma, M. D. (2008). Coherence or interest: Which is most important in online multimedia learning? *Australasian Journal of Educational Technology (AJET)*, 24(2), 211–221.
- Neo, M. (2013). Enhancing the teaching and learning process with the MILE research lab. Invited book chapter. *Pelan Strategik Pengajian Tinggi Negara (National Strategic Plan) – Selected activities series 4 (Ministry of Education Malaysia)*, Malaysia, 4, 130–141.
- Neo, T. K., & Neo, M. (2010). A study using web-logs or blogs as a tool for student-centred learning in a computer graphics course: A Malaysian perspective. *The International Journal of Learning*, 17(9), 77–86.
- Neo, M., & Neo, T. K. (2013). Exploring students' creativity and design skills through a multimedia project: A constructivist approach in a Malaysian classroom. *Design and Technology Education: An International Journal*, 18, 48–59.

- Suh, H. (2011). Collaborative learning models and support technologies in the future classroom. *International Journal for Educational Media and Technology*, 5(1), 50–61.
- Tan, O. S., Teo, C. T., & Chye, S. (2009). In Oon-Seng, T (Ed.), *Problem-based learning and creativity* (pp. 1–14). Singapore: Cengage Learning Asia Pte. Ltd.
- Wilson, B. G. (1995). Metaphors for Instruction: Why we talk about learning environments. *Educational Technology*, 35(5), 25–30.

Chapter 30

Innovating Learners Through Reading: Investigating ESL Students' Reading Performance

Lim Peck Choo, Gurnam Kaur Sidhu, Chan Yuen Fook,
and Fazyudi Ahmad Nadzri

Abstract The pre-diploma English language preparatory course is a course offered in Universiti Teknologi MARA (UiTM) which caters for students at risk of educational failure. The main aim of the course is to upgrade the English proficiency levels of disadvantaged Malay and Bumiputera students to not only help them further their studies at diploma level but also to equip them with literacy skills required for innovation societies in the twenty-first century. Literacy skills, particularly reading skills, are of utmost importance in the twenty-first century which places a premium on the exchange of information. Hence, tertiary students should have good reading skills to help them gain knowledge as well as to be successful in the twenty-first century. This paper investigates ESL students' reading performance in the Pre-Diploma English course. The study involved a total of 255 students from three UiTM branch campuses, namely Kelantan, Seremban and Melaka. The students were required to sit for a validated and reliable Diagnostic English Language Test to assess their reading performance. Results indicated that close to half of the students failed the test i.e. they obtained grade bands of 'C-' and below. The results also show that there is no significant difference in students' performance based on their gender. However, there is a significant difference in their performance based on language proficiency levels, discipline and locality. The findings show that the majority of these students have low proficiency and need more support and strategy training so that they can master reading skills necessary for innovation in the twenty-first century.

L. Peck Choo (✉)

Academy of Language Studies, Universiti Teknologi MARA, 40450 Shah Alam,
Selangor, Malaysia

e-mail: pclim@salam.uitm.edu.my

G.K. Sidhu • C.Y. Fook • F.A. Nadzri

Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia

e-mail: gurnamsidhu@salam.uitm.edu.my; yuenfook@salam.uitm.edu.my;
fazyudi@salam.uitm.edu.my

Keywords English as a second language (ESL) • Reading performance

30.1 Introduction

Education in the twenty-first century places a premium on the exchange and interpretation of information and the development of knowledge (Castells 1996). To prepare students to be competitive in the information age, education should infuse twenty-first century skills into core academic subjects. The twenty-first century skills refer to a set of essential abilities students need in our rapidly changing world. Therefore, it is important to equip students with literacy skills which help them gain knowledge through reading as well as using media and technology. In this information age, students are required to consume a lot of information that requires them to do a lot of reading. This means that students need to be able to work effectively with information, using it at all levels of Bloom's Taxonomy (remembering, understanding, applying, analyzing, evaluating, and creating). Learners have to be innovative in order to succeed in the twenty-first century. The best way to foster this is by acquiring foundational skills such as reading.

Hence, it is important that programmes and courses which are aimed at helping at risk students, equip them with literacy skills particularly reading skills. The pre-diploma English language preparatory course at Universiti Teknologi MARA (UiTM hereafter) in Malaysia is aimed at assisting disadvantaged students to help them further their studies in institutions of higher learning with proper support and assistance to prepare them for innovation societies in the twenty-first century.

It is a requirement for pre-diploma students to take a compulsory Preparatory English language course which is aimed at upgrading their proficiency levels. It is a six credit unit course with six contact hours per week. The course focuses on the four language skills of reading, listening, speaking and writing. In addition, grammatical items are taught incidentally through the teaching of the four skills.

A majority of the students who are enrolled in the course came in with limited English language proficiency. According to Sun et al. (2010), a solid foundation in literacy is a key factor for academic success. This suggests that in order for these students to achieve academic success, they need to have good reading skills. It is, therefore, the aim of this study to investigate the pre-diploma students' reading performance at the end of the English language preparatory course.

According to Bråten (1997 as cited in Hellekjaer 2009) reading is more than simply decoding the written words in a text. It is an interactive process which involves the active creation of meaning between information in a text and the knowledge of the reader. Current reading research stresses the interactive and constructive nature of reading (Greaney 2004; Kouder and Reichard 2002; Van Keer and Verhaeghe 2005).

It is widely acknowledged that reading in L1 has influenced and shaped L2 research (Block 1992). Grabe (1999) found that the reading process in an L1 and L2 is similar, but cautioned that it is subject to "a number of additional constraints on

reading and its development” (p. 11). The present view is that L2 readers apply dual-language system in their reading (Koda 2005, 2007) which benefits L2 reading. This is corroborated by Cummins (2000) who posits that “academic proficiency transfers across languages such that students who have developed literacy in their first language will tend to make stronger progress in acquiring literacy in their second language” (p. 173). Similarly, Bernhardt (2005) asserts that, “the question is not if language and literacy skills transfer. The question is how much transfers, under what conditions, and in which contexts” (p. 138). She further attempted to quantify the importance of L1 literacy, L2 language knowledge, and “unexplained variance” which includes content, comprehension strategies, interest and motivation, and etc... for L2 reading. Bernhardt also suggests that these variables interact and that a weakness in one area might be compensated for by knowledge from another. Koda (2007) developed this further, looking at the conditions under which this transfer might occur.

Apart from the influence of L1 on L2 reading, it is believed that the English proficiency levels of the students can affect their reading performance. Previous research on reading showed that low English proficiency can impede English as a second language (ESL) learners' ability to read in English until they have achieved adequate proficiency (Sun et al. 2010). It is often assumed that students at tertiary level have attained the skills and strategies required for academic reading in their L1 and should, therefore, be able to transfer them to their L2 reading (Koda 2005, 2007). The ability to do so is very much dependent on the readers' L2 proficiency, also known as the linguistic threshold level. This means that if the readers have low L2 proficiency, then the transfer of these skills and strategies from L1 to the L2 is impeded even if the learners are fluent L1 readers (Alderson 2000; Bernhardt and Kamil 1995; Carrell 1991; Laufer 1997).

Nevertheless, current studies have established that English language proficiency level is not the sole determinant of who will struggle with reading. Moreover, it was found that high-quality intervention during the early stages of reading development can help those with low levels of English proficiency to achieve at least average levels of performance (Lesaux and Siegel 2003; Vaughn et al. 2006).

To sum up, it is therefore essential to look into the reading performance of these pre-diploma students after they have completed their pre-diploma English language course. This is particularly important as reading is a foundational skill necessary for academic success as well as preparing them for innovation in the twenty-first century. The results of the study would then be able to tap into the constraining factors in L2 reading.

30.2 Method

This study was conducted in UiTM which is the largest public university in Malaysia. It has branch campuses in all the 14 states in Malaysia. English is used as a medium of instruction in UiTM. A mandatory pass in English is a requirement for students

Table 30.1 Students' demographic profile

Frequency		Number	Percentage (%)
Campus	Melaka	144	52.7
	Seremban	67	24.5
	Kelantan	61	22.3
Gender	Male	78	28.6
	Female	193	70.7
Course	Science	73	26.7
	Non-science	195	71.4

to graduate. For this study, three branch campuses were randomly selected for the study, each representing the North, Central and South zones respectively.

Table 30.1 depicts the demographic data of the respondents in the study, in terms of their locality, gender and their course discipline. The population sample in this study consisted of three groups of students from the three branch campuses randomly chosen in the study. All these students were taking the Pre-Diploma English language preparatory course. The final sample of this study involved a total of 272 pre-diploma students from the three branch campuses i.e. Seremban (Central), Melaka (South) and Kelantan (North). The sample comprised 28.6 % (78) male and 70.7 % (193) female students. The number of students from the Science and Non-Science disciplines was 73 and 195 respectively. Students sat for an English language diagnostic test which comprised four reading comprehension passages and a writing test. The test was validated twice by a panel of experts which comprised three experienced lecturers teaching ESL at the university. The reading passages were of varying readability levels and moved from simple to difficult. The Flesch-Kincaid readability index was used for this purpose. For the purpose of this study only the results of the reading comprehension component will be discussed.

30.3 Results and Discussion

A total of 272 students sat for the English language diagnostic test. A majority of the students completed the test. They sat for the test in the halls of the three respective branch campuses. However, there were some students who did not complete the test. As such, these incomplete scripts were discarded and were not used for analysis. Therefore, only a total number of 255 scripts were used for data analysis.

In this study the respondents' English language proficiency was determined based on their results in the Secondary Five SPM (Sijil Peperiksaan Malaysia) English Language examination. Based on their results, only 3.7 % can be categorised as having high language proficiency (Distinction A), 20.5 % were of average proficiency (credits B, C and D) whilst the remaining 75.8 % had limited proficiency.

The findings will first discuss the students' overall reading performance followed by their performance based on the demographic factors which include gender, course disciplines, language proficiency and locality.

30.3.1 Students' Overall Reading Comprehension Performance

Table 30.2 below shows the mean score for students' overall reading performance from the three campuses. It was found that the mean score obtained was 49.89 (SD= 13.29) and the highest value mean score was 86, while the lowest was 8.

Figure 30.1 below shows students' overall reading performance by grade bands. Most of the students obtained grade 'C' (18.4 %), followed by 'E' (15.3 %). However, the least percentage of students obtained 'A-' (1.2 %), followed by 'A' (2.4 %). The findings indicated that a majority of the students just managed to obtain the minimum standard requirement to pass their reading test. Furthermore, the figure also shows that students' performance for the reading test was mixed with grade bands varying from 'A' to 'F'. A close examination of the figure below shows that close to half the students (49.8 %) failed the reading test i.e. they obtained grade bands of 'C-' and below. This suggests that almost half of the students have poor reading skills.

Table 30.2 Mean score for students' overall reading performance

N	Minimum	Maximum	Mean	Std. deviation
255	8.00	86.00	49.89	13.29

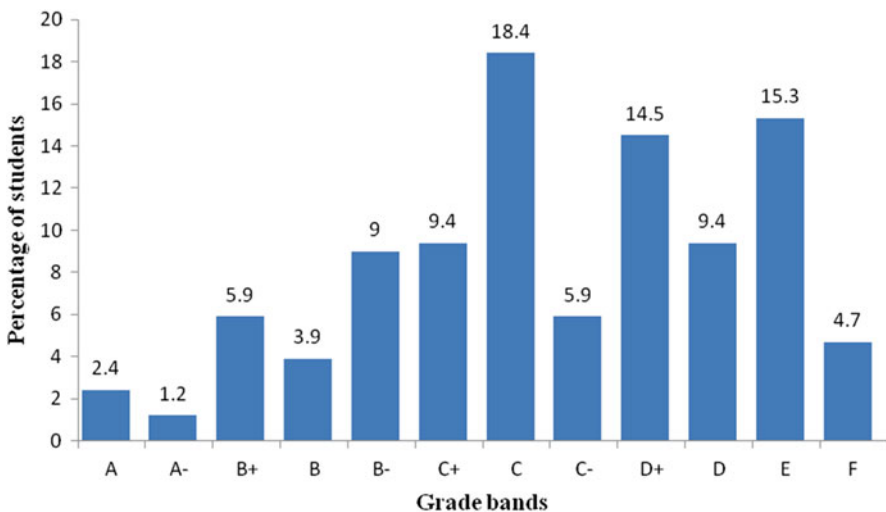


Fig. 30.1 Students' overall reading performance by grade bands

Table 30.3 T-tests analysis of students' overall reading performance by gender (n=254)

Gender	N	Mean	Std. deviation	Std. error mean	t	Sig. (2-tailed)
Male	73	49.07	14.28	1.67		
Female	181	50.28	12.91	.96	-.65	.51

Levene's Test for Equality of Variances : F=1.093, p=.297

30.3.2 *Students' Overall Reading Comprehension Performance Based on Demographic Factors*

This section discusses the students' reading comprehension performance based on the following demographic factors.

- Gender
- Disciplines
- Language Proficiency
- Locality

30.3.2.1 *Students' Reading Performance by Gender*

The results from an independent *t*-test analysis (Table 30.3) shows that there is no significant difference in students' mean scores for reading by gender [$t(254) = -.65$, $p\text{-value} = .51$]. This was reflected by the mean reading scores obtained by the male students ($M = 49.07$, $SD = 14.28$) which was not significantly different from the average reading scores obtained by the female students ($M = 50.28$, $SD = 12.91$). Hence, the null hypothesis is accepted. This suggests that the reading performance of both male and female students is similar. The Levene Test for equality of variances has confirmed that the different number of male and female students did not affect the means to be compared in the independent sample *t*-test ($F = 1.093$, $p > .05$).

30.3.2.2 *Overall Reading Comprehension Performance by Course Discipline*

The results from an independent *t*-test analysis in Table 30.4 highlights that there is a significant difference in students' mean reading scores between their course disciplines [$t(251) = 4.68$, $p = .000$]. The mean reading scores obtained by Science students ($M = 55.8$, $SD = 11.89$) was significantly different from the average reading scores obtained by the Non-Science students ($M = 47.71$, $SD = 13.26$). Hence, the null hypothesis is rejected. This means that students in the Science discipline performed significantly better than those in the Non-science students. The Levene Test result ($p > .05$) has confirmed the different number of Science ($n = 70$) and Non-Science students ($n = 181$) did not affect the mean scores to be compared in the independent sample *t*-test.

Table 30.4 Students' overall reading performance by disciplines (n=251)

Course	N	Mean	Std. deviation	Std. error mean	t	Sig. (2-tailed)
Science	70	55.80	11.89	1.42	4.68	.000
Non-science	181	47.71	13.26	.99		

Table 30.5 Students' overall reading performance with regard to language proficiency

Students' language proficiency (SPM English)	N	Mean	Std. deviation	Minimum	Maximum
A+	3	66.00	19.29	44.00	80.00
A	7	73.71	12.24	52.00	86.00
A-	2	62.00	16.97	50.00	74.00
B+	18	57.67	12.69	32.00	76.00
B	30	58.80	12.30	32.00	84.00
B-	3	64.67	11.37	52.00	74.00
C+	30	55.73	9.92	32.00	76.00
C	31	49.16	10.72	22.00	74.00
C-	4	40.00	12.33	26.00	56.00
D	93	45.39	9.77	20.00	68.00
E	32	37.44	8.90	8.00	56.00
Missing value	2	56.00	5.66	52.00	60.00
Total	255	49.89	13.29	8.00	86.00

Table 30.6 One-Way ANOVA of students' overall reading performance by language proficiency

	Sum of squares	df	Mean square	F	Sig.
Between groups	17,515.82	11	1592.35	14.15	.000
Within groups	27,353.11	243	112.56		
Total	44,868.93	254			

30.3.2.3 Students' Overall Reading Comprehension Performance by Language Proficiency

Table 30.5 shows students' overall reading performance based on their language proficiency. The results show that the highest mean score was obtained by students with grade 'A' (M=73.71, SD=19.29). In contrast, the lowest mean score was obtained by students with grade 'E' (M=37.44, SD=8.90). On the whole, it can be seen that students' overall performance in the reading test matched their language proficiency whereby the good students did well, average students performed average and the weak students did poorly.

A one way analysis of variance (ANOVA) revealed that there was a significant difference in the students' mean scores based on their language proficiency, [F (11, 243)=14.15, p=000] as can be seen in Table 30.6. The Tukey test has confirmed that the different number of students with varied SPM English language grades did

Table 30.7 Students' overall reading performance with regard to campus locality

	N	Mean	Std. deviation	Minimum	Maximum
Melaka	131	49.24	13.28	20.00	86.00
Seremban	64	56.41	12.09	32.00	84.00
Kelantan	60	44.37	11.75	8.00	74.00
Total	255	49.89	13.29	8.00	86.00

Table 30.8 One-way ANOVA of students' reading performance by campus locality

	Sum of squares	df	Mean square	F	Sig.
Between groups	4603.89	2	2301.95	14.41	.000
Within groups	40,265.04	252	159.78		
Total	44,868.93	254			

not affect the mean scores to be compared. Therefore, the null hypothesis is rejected. This shows that students' performance in the reading test matched their language proficiency levels.

30.3.2.4 Students' Overall Reading Performance by Campus Locality

Table 30.7 shows students' overall reading comprehension performance based on the three different campus localities. Of all the three campuses, the highest mean score was obtained by students in Seremban ($M=56.41$, $SD=13.28$). The second highest mean score was obtained by students in Melaka ($M=49.24$, $SD=12.09$) whereas the lowest mean score ($M=44.37$, $SD=11.75$) was obtained by students in Kelantan. This means that on the average, majority of the students in Seremban and Melaka passed their reading test (pass mark = 50) but most of the students in Kelantan failed theirs.

A one way analysis of variance (ANOVA) revealed that there was a significant difference in the students' reading marks based on their localities, $F(2, 252)=14.41$, $p=.000$. This suggests that the null hypothesis of no differences is rejected. This indicates that campus locality has an effect on students' reading performance (Table 30.8).

30.4 Discussion

The English language reading education of learners has become an issue of great concern (Slavin 2003). The Programme for International Student Assessment (PISA) study has repeatedly found that too many 15-year olds have only a basic proficiency in text understanding (2012). This is particularly true for English as second language (ESL) learners at tertiary levels. This means that these ESL

learners who would later enter institutions of higher learning, would face difficulty coping with the copious amount of academic reading. Research has found that reading is essential for academic success. In addition, it is essential for students to acquire foundational skills such as reading to be able to compete in the twenty-first century.

The findings in this study show that on the whole, students in the pre-diploma English language course have poor reading skills. Whilst there were a few who obtained grade A, the majority of them failed obtaining grade C– and below. In fact, the majority of those who passed only managed a grade C, which is the minimum requirement for a pass. The results are troubling in that these students have been studying English for the past 11 years and yet they have limited reading ability. This is further exacerbated by the finding that as the difficulty level of the readability index of the passages increased, the students' reading performance decreased. Students performed best at the PMR level. This suggests their limited reading proficiency. Findings also indicated that there was significant difference in students' reading performance with regards to course discipline, language proficiency and locality. However, there was no significant difference with regard to gender.

Although Science students performed significantly better than the Non-Science students, the mean scores showed that they (the Science students) obtained just one grade (Grade C) better than the Non-Science students (grade C–). What this suggests is that both the Science and non-Science students need support and assistance to improve their reading proficiency. Currently both sets of students are proficient but only at the Flesch Kincaid reading grade 8 which is equivalent to Secondary 3 level. This is obviously very much lower than their expected level of proficiency which should be at the Flesch Kincaid reading grade 12 at least. This is the level appropriate for students preparing for university education in Malaysia. What is particularly troubling is the fact that these students also have difficulty coping with passages at the Flesch Kincaid reading grade 10. The concern here is that these students have just completed their SPM examination and yet they have difficulty answering reading comprehension questions at this level. It shows the extent of poor reading abilities of these students which may persist in higher education. This has implications for the pre-diploma English language course developers. The English course has to not only equip students with reading skills necessary for academic reading in the university but also to address the poor reading skills which these students came in with.

Another finding is that there is significant difference in students' reading performance with regard to campus locality. Of the three branch campuses, Seremban obtained the highest mean score (Grade C+), followed by Melaka (Grade C–) and Kelantan (Grade D+). Apart from Seremban, students from Melaka and Kelantan failed the reading component of the diagnostic test. It is unclear if the students came from the respective states of the branch campuses or they comprised students from all over Malaysia. Nevertheless, what is worrying is the fact that only students from one campus passed the reading component of the diagnostic test, and even then, they passed with a mean grade of only C+. All these reinforce the idea that the pre-diploma English language students generally have poor reading skills.

Findings in this study also revealed that there is significant difference in students' reading performance with regard to their language proficiency. More than half of the students obtained C- and below in their SPM English. Out of these, one third obtained a grade D. What this shows is that the majority of pre-diploma English language students have low English language proficiency. This has important implications for L2 instruction of the pre-diploma English language course. Research on L2 reading has shown that although reading is described as an interactive process, low proficiency students tend to use more of the lower level (bottom-up) process compared to the higher level (top-down) process (Alderson 2000; Bråten, 2007 as cited in Hellekjaer 2009; Grabe 2009; Koda 2005). This bottom-up process is dependent upon automatic word recognition which then provides the basis for higher-level processing (Hellekjaer 2009). In contrast, this would be an effortless process for a proficient reader. For that reason, researchers like Grabe (1988, 2009) and Alderson (2000) have stressed the importance of vocabulary knowledge in reading. In fact, Alderson (2000) posits that the measures of a reader's vocabulary knowledge correlates highly with measures of reading comprehension, and are often the single best predictor of text comprehension. Hence, it is important for the pre-diploma English course to build students' vocabulary knowledge in their respective disciplines.

Furthermore, Alderson has found that proficient readers use metacognitive monitoring strategies to monitor their understanding of the text; and use linguistic and/or content knowledge to aid comprehension. This is one main factor distinguishing proficient readers from poor readers (Alderson 2000; Bråten and Olaussen 1998; Slavin 2003). Good readers evaluate their comprehension through the use of meaning-based cues whereas poor readers are overly dependent upon word-level cues and tend to focus on intrasentential rather than intersentential consistency. This focus on micro level cues (word-level and intrasentential relations) may explain why many poor readers' comprehension is impeded by unfamiliar vocabulary. In contrast, proficient readers are able to disregard unfamiliar words which disrupt their reading process.

The use of metacognitive strategies by proficient readers to aid reading comprehension has important implications for the pre-diploma English language programme. This suggests that learning strategies, particularly, language learning strategy should be incorporated in the instruction for the pre-diploma course. A strategy is a set of abilities that a reader makes use of consciously or automatically (Urquhart and Weir 1998). Language learning strategies comprise the metacognitive, cognitive as well as the socio-affective strategies (Chamot and O'Malley 1987). Incorporating these strategies explicitly in L2 reading instruction would indeed be useful for at risk learners like the MDAB students who have demonstrated low English language proficiency in this study.

30.5 Conclusion

To conclude, the study found that almost half of the pre-diploma English language students failed the reading component of the English language diagnostic test. Furthermore, it was found that students do not have adequate vocabulary necessary

for efficient L2 reading. The study also shows that there were significant differences in the results with regard to course discipline, language proficiency and locality but not gender. These imply that most of these at risk students have low language proficiency which hinders their L2 English language reading comprehension. It can be inferred that these students have poor basic learning strategies which may have led to their poor reading performance in the Diagnostic test. What this suggests is that learning strategies especially language learning strategies should be incorporated into L2 reading instruction to remedy the students' poor reading comprehension. In the long term, improving their reading skills would not only prepare these students at risk of educational failure to improve their academic reading but also to equip them with twenty-first century basic literacy skills to prepare them to handle the current excess of information necessary for innovation societies. However, it must be stressed that improving vocabulary skills and strategy training are not the only panacea for improving reading performance. There are many other factors that contribute to ESL learners' reading performance such as attitude, motivation which need to be looked into as well.

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References

- Alderson, J. C. (2000). *Assessing reading*. Cambridge: Cambridge University Press.
- Bernhardt, E. B. (2005). Progress and procrastination in second language reading. *Annual Review of Applied Linguistics*, 25, 133–155.
- Bernhardt, E. B., & Kamil, M. L. (1995). Interpreting relationships between L1 and L2 reading: Consolidating the linguistic threshold and the linguistic interdependence hypotheses. *Applied Linguistics*, 16, 15–34.
- Block, E. (1992). See how they read: Comprehension monitoring of L1 and L2 readers. *TESOL Quarterly*, 26(2), 319–343.
- Bråten, I., & Olaussen, B. S. (1998). The relationship between motivational beliefs and learning strategy use among Norwegian college students. *Contemporary Educational Psychology*, 23, 182–194.
- Carrell, P. L. (1991). Second language reading: Reading ability or language proficiency? *Applied Linguistics*, 12, 159–179.
- Castells, M. (1996). *The rise of the network society: The information age: Economy, society, and culture* (Vol. I). Oxford: Blackwell Publishers.
- Chamot, A. U., & O'malley, J. M. (1987). The cognitive academic language approach: A bridge to the mainstream. *TESOL Quarterly*, 21(2), 227–249.
- Cummins, J. (2000). *Language, power and pedagogy*. Clevedon: Multilingual Matters.
- Grabe, W. (1999). Developments in reading research and their implications for computer adaptive reading assessment. In M. Chalhoub-Deville (Ed.), *Issues in computer-adaptive testing of reading proficiency* (pp. 11–47). Cambridge: Cambridge University Press.
- Grabe, W. (1988). Reassessing the term interactive. In P. L. Carrell, J. Devine, & D. E. Eskey (Eds.), *Interactive approaches to second language reading*. Cambridge: CUP.

- Grabe, W. (2009). *Reading in a second language*. Cambridge: Cambridge University Press.
- Greaney, K. T. (2004, September 14–18). *Good decoders but poor comprehenders: Why the discrepancies?* Paper presented at the BERA conference, Manchester. Retrieved August 10, 2005, from http://education.massey.ac.nz/PDF-Files/greaney/Bera_paper.pdf
- Hellekjaer, G. O. (2009). Academic English reading proficiency at the university level: A norwegian case study. *Reading in a Foreign Language, 21*(2), 198–222.
- Koda, K. (2005). *Insights into second language reading*. Cambridge: Cambridge University Press.
- Koda, K. (2007). Reading and language learning: Crosslinguistic constraints on second language reading development. *Language Learning, 57*(1), 1–44.
- Kouder, M., & Reichard, C. A. (2002). Assessing students' metacognitive awareness of reading strategies. *Journal of Educational Psychology, 94*(2), 249–259.
- Laufer, B. (1997). The lexical plight in second language reading. In J. Coady & T. Huckin (Eds.), *Second language vocabulary acquisition* (pp. 20–34). Cambridge: Cambridge University Press.
- Lesaux, N. K., & Siegel, L. S. (2003). The development of reading in children who speak English as a second language. *Developmental Psychology, 39*, 1005–1019.
- Slavin, R. E. (2003). *Effective reading programs for English language learners: A best-evidence synthesis*. Report No. 66. Publications Department, CRESPAR: Johns Hopkins University.
- Sun, J. W., Nam, J. E., & Vanderwood, M. L. (2010). *English language learners (ELL) and response to intervention (RTI): Information for K–6 educators*. Bethesda, MD: National Association of School Psychologists.
- Urquhart, S., & Weir, C. (1998). *Reading in a second language: Process, product and practice*. London: Longman.
- Van Keer, H., & Verhaeghe, J. P. (2005). Effects of explicit reading strategies instruction and peer tutoring on second and fifth graders reading comprehension and self-efficacy perceptions. *The Journal of Experimental Education, 73*(4), 291–329.
- Vaughn, S., Mathes, P., Linan-Thompson, S., Cirino, P., Carlson, C., Pollard-Durodola, S., et al. (2006). Effectiveness of an English intervention for first-grade English language learners at risk for reading problems. *The Elementary School Journal, 107*, 153–180.

Chapter 31

Student Perception of Using Project-Based Learning (PjBL): A Case Study in Universiti Teknologi Malaysia (UTM)

Van Ngoc Sang and Nguyen Thuy Van

Abstract Active learning has attracted strong advocates among faculty looking for alternatives to traditional teaching methods. Project-based learning has been recently introduced as an add-on teaching method in some countries. In Universiti Teknologi Malaysia, Project-Based learning has been introduced as part of the curriculum to inculcate entrepreneurial thinking skills. This paper discusses the feedback on students' perceptions regarding the implementation of project-based learning. The findings of the paper show that most students have positive perception of using Project-based learning as a teaching method and agree to learn using the same method in the future. Learners also highly appreciated that project-based learning promoted their soft-skills, includes of *Teamwork; Project Management; Communication Skills, Interpersonal Skills*. The results of the study did not show any significant differences in perceptions between male and female students in using Project-based learning in the training programs.

Keywords Project based learning • Soft skills • Student perception

31.1 Introduction

Higher Education Institutions (HEIs) in developing countries aimed to put the words of Innovative – Global – Entrepreneurial in their mission as the directions for activities and strategic thrusts in order to move forward towards being a global university. HEIs try to provide stimulating, entrepreneurial and quality learning environment for students in discipline to achieve their study goals. One of the initiatives

V.N. Sang (✉)

Technology of Education, Universiti Teknologi Malaysia, Johor Bahru, Malaysia
e-mail: sangpodam@yahoo.com

N.T. Van

Faculty of Education, Universiti Teknologi Malaysia, Johor Bahru, Malaysia
e-mail: thuyvanpy2000@yahoo.com

for achieving this thrust is the implementation of project-based learning (PjBL) in curriculum with the aim of exposing students to the real world and inculcating entrepreneurial thinking skills as well as developing soft-skills to enable them to adapt to the highly competitive labor market environment (Lawrence 1997; NCIHE 1997; Mohamed Khalid Nordin 2009; Treleavan and Voola 2008).

Using PjBL as a teaching method has been proven to be effective which engages students in an organized and cooperative manner to investigate and resolve certain problems. Moursund (2007) defines project-based learning as an individual or group activity that goes on over a period of time, resulting in a product, presentation or performance; PjBL typically has a time line and milestones, and other aspects of formative evaluation as the project proceeds (Ahluwalia & Agrawal 2010). Moss et al. (1998) affirm that project-based work lends itself well to evaluations of both language skills and employability skills. Consequently, in PjBL, learners learn meaningfully through the process of exploring, scaffolding, interpreting, negotiating, and creating products namely presentation and written report required in their project work. It is undeniable that PjBL is beneficial to students' as they acquire and practice not only workplace skills but also soft skills while carrying out the project work. Advantages of PjBL include greater student and faculty interest and interactivity, vicarious learning, and increased reflection (Bell 2010; Doppelt 2003). Furthermore, Kloppenborg and Baucus (2004) outlines the benefits of using PjBL as an interactive learning strategy, shifting the emphasis to more student-centred activities rather than teacher-centred.

In this research study the following hypotheses is are tested:

1. H^1 : Students' perceptions of using PjBL in the curriculum is related to knowing more about the real world, enjoy, learning more soft skills and gaining benefits from it.
2. H^2 : Students' perceptions of using PjBL help them develop soft skills, such as: *Teamwork, Project Management, Communication Skills and Interpersonal Skills*.
3. H^3 : There is no significant difference between different types of gender in terms of using PjBL in the curriculum.

31.2 Literature Review

31.2.1 *The Benefits of Project-Based Learning (PjBL)*

Markham (2011) has described that project-based learning (PjBL) PjBL integrates knowing and doing. Students learn knowledge and elements of the core curriculum, but also apply what they know to solve authentic problems and produce results that matter. PjBL students take advantage of digital tools to produce high quality, collaborative products. PjBL refocuses education on the student, not the curriculum—a shift mandated by the global world, which rewards intangible assets such as drive, passion, creativity, empathy, and resiliency. These cannot be taught out of a textbook, but must be activated through experience.

In real workplace settings, students implement project-based learning as they are really able to gain knowledge and skills more than in classroom. For example, skills

such as decision-making, problem-solving, managing conflicts, team working and being innovative are important elements of job competence. Gultekin in Bell (2010) affirms that through PjBL students become better researchers, problem solvers, and higher-order thinkers. Research supports that students using PjBL perform better on both standardized assessments and project tests than students in traditional direct instruction programs, and that they learn not only real-world application of skills, but also analytical thinking as stated in Boaler's study (1999).

Especially, the twenty-first century workforce should have a new mindset in encountering the challenges and demands of the workplace. Pink (2005) argues that the workplace is changing as a result of three factors: Asia, abundance, automation and that to remain competitive workers will need new skills; Pink's findings correspond with those of other experts and researchers who have studied the changing workplace and the skills that will be needed for continued work success. In the process of PjBL student need both of academic and social skills for completing the project. Particularly, learners are involved in preparing meeting, questions and discuss to collect relevant information for their project. Rosen (1998) emphasizes that learners develop questions as a group, divide the work among individuals or pairs to find answers to selected questions using a variety of sources such as the internet or guest speakers. Rosen (1998) also states that the criteria for project work are, learners work in a group to select topics of interest and decide the direction of their learning. They rely on insights from their peers while providing feedback to others, use the teacher as a resource, but by and large, and create their own knowledge. Kloppenborg and Baucus (2004) also reported on the learning outcome of students as manifested in their successful experiences gained in planning, managing, and accomplishing projects. Kloppenborg and Baucus (2004) reiterated that many of skills learned through PjBL are highly sought by today's employers including the ability to work well with others and handle interpersonal conflicts, make thoughtful decisions, practice and solve complex problems.

Successful experiences include the ability to resolve conflicts through creative problem solving approaches and the accomplishment of a project that make them more aware of real life problems and issue. Bell (2010) states that project based learning (PjBL) promotes social learning as students practice and become proficient with the twenty-first century skills of communication, negotiation, and collaboration. When students share their work or challenges, a brainstorming session often helps them build on each other's ideas for future possibilities which promotes creativity and out-of-the-box thinking. Therefore, PjBL plays a significant role in exposing students to a meaningful learning process while they are engaged in completing their project.

Graduates of today need to become proficient in twenty-first century workplace skills as to meet the challenges of this era. The respective skills are critical thinking and problem solving, communication, collaboration, creativity and innovation; that also increasingly demand creativity, perseverance and problem solving combined with performing well as part of a team. The enGauge Report (2003) asserts that "rapid change and increased competition require that workers use their soft skills to adapt quickly to changing technologies and organizational structures"(pg. 8). The future era calls for proactive individuals with creative

minds. “The future belongs to a very different kind of person with a very different type of mind (pg. 1)” reminds Pink (2005).

According to Ng et al. (2009), in a survey conducted in 2004 by the Central Bank of Malaysia, involving 312 companies, 77.6 % of the respondents were of the view that Malaysian graduates lack the required skills to function effectively at the workplace. This concern has been one of the deliberated issues discussed among the academia in Malaysia, and other regions. It is timely for Malaysia to revamp its education system that is market driven in order to produce ‘work-ready graduates’

31.2.2 The Strategies for Using Project-Based Learning

Project-based learning emphasizes learning activities that are long-term, interdisciplinary and student-centered. Unlike traditional, teacher-led classroom activities, students often must organize their own work and manage their own time in a project-based class. Project-based instruction differs from traditional inquiry by its emphasis on students’ collaborative or individual artifact construction to represent what is being learned (Grant 2002, Sidman-Taveau and Milner-Bolotin 2001). The core idea of project-based learning is that real-world problems capture students’ interest and provoke serious thinking as the students acquire and apply new knowledge in a problem-solving context. The teacher plays the role of facilitator, working with students to frame worthwhile questions, structuring meaningful tasks, coaching both knowledge development and social skills, and carefully assessing what students have learned from the experience. Typical projects present a problem to solve or a phenomenon to investigate (Thomas 2000).

Comprehensive Project-based Learning: (1) is organized around an open-ended driving question or challenge; (2) creates a need to know essential content and skills; (3) requires inquiry to learn and/or create something new; (4) requires critical thinking, problem solving, collaboration, and various forms of communication, often known as “21st Century Skills.”; (5) allows some degree of student voice and choice; (6) incorporates feedback and revision; (7) results in a publicly presented product or performance (Thomas 2000; Tretten and Zachariou 1995).

31.3 Method

This study used survey instrument to evaluate students’ perceptions toward using project-based learning. The survey consists of 22 closed ended questions and 01 open question that have been divided into two sections. The first section included demographic questions such as the program of study, gender, faculty, major and type of study for the respondent.

The second section included four point Likert scale questions related to the usage of project-based learning. The questionnaires were distributed among 50 respondents of students from the Universiti Teknologi Malaysia (UTM).

The appropriate case study article that suite with the content of the course study has been selected. Students were initially given questionnaire with the idea that they

had a good understanding about the PjBL background, scenario and issue. Students were evaluated based on active participation during the discussion session for 2 h. The questionnaire was distributed to all students at the end of the session.

31.4 Findings

31.4.1 Student’s Perception of Positive of Project-Based Learning

The respondents for the survey were made truly representative by keeping equal number of female and male students like 52 % out of 50 respondents are female and 48 % of the respondents were male.

The descriptive analysis for early four questions shows positive perception of students for the Project-based learning discussion implementation. This is illustrated in Table 31.1.

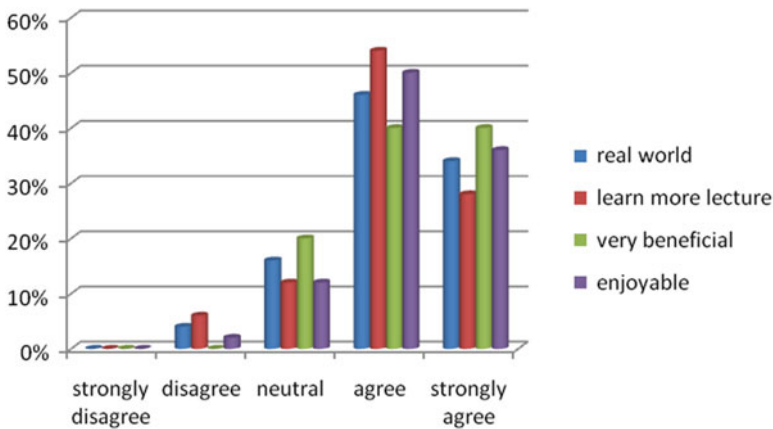


Table 31.1 Descriptive analysis of questionnaire in general positives of Project-based learning

Statements	1	2	3	4	5
I think i get to know more about the real world when learning using the Project-based learning	0 %	4 %	16 %	46 %	34 %
I think i will learn more using project-based learning compared to listening to lectures	0 %	6 %	12 %	54 %	28 %
I think learning through project-based learning is very beneficial	0 %	0 %	20 %	40 %	40 %
I think learning through the project-based learning is enjoyable	0 %	2 %	12 %	50 %	36 %

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

For the four questions, the cumulative percentage of students who answered ‘Agree’ and “Strongly Agree” is equal or more than 80 % which strongly shows students’ positive perceptions.

31.4.2 Student’s Perception of Enhancing Soft-Skills from Project-Based Learning

For the teamwork skills, the cumulative percentage of students who answered ‘Agree’ and “Strongly Agree” is equal or more than 78 % which strongly shows students’ positive perceptions. In 50 students were asked to respond to the soft skills learned from teamwork. Majority of the respondents or 88 % agreed that they learned that good team-work contributes to a successful outcome of the project. This is evident when 86 % of students responded they learned how to be assertive when exchanging ideas with group members. See Table 31.2.

However, 20 % students’ answer is “neutral” in question “*I learned how to listen actively to my group members*”. This indicated that with young student, listening to another opinions need to learn and practice more.

This finding has shown that students have successfully worked in groups in managing the assigned tasks in the project work. Rosen (1998) emphasizes that learners develop questions as a group, divide the work among individuals or pairs to find answers to selected questions using a variety of sources such as the internet or guest speakers. Rosen (1998) also states that the criteria for project work are, learners work in a group to select topics of interest and decide the direction of their learning; they rely on insights from their peers while providing feedback to others; they may use the teacher as a resource, but by and large, they create their own knowledge (Table 31.3).

The project which was successfully completed as a result of teamwork effort also helps develop individual soft skills especially project management. It is apparent that when students are able to work in a team, they display confidence in giving suggestions. A total of 82 % of the respondents acknowledged they feel they have the confidence to give suggestions without any form of apprehension. However, 80 %

Table 31.2 Students’ responses on teamwork from project-based learning

Statements	1	2	3	4	5
I learned how to listen actively to my group members		2 %	20 %	38 %	40 %
I learned how to ask and respond appropriately among group members.		2 %	16 %	42 %	40 %
Learned how to be assertive when exchanging ideas with group members.		2 %	12 %	58 %	28 %
I learned that good team-work contributes to a successful outcome of the project		4 %	8 %	42 %	46 %

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

Table 31.3 Students’ responses on project management from project-based learning

Statements	1	2	3	4	5
I am confident to give suggestions freely among group members		2 %	16 %	40 %	42 %
I learned how to brainstorm and forward ideas appropriately with group members		4 %	16 %	36 %	44 %
I understand and able to gather information for the project			12 %	46 %	42 %
learned how to identify the relevant ideas from reading materials regarding project work		4 %	18 %	46 %	32 %

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

Table 31.4 Students’ responses on communication skills from project-based learning

Statements	1	2	3	4	5
I learned to write e-mails related to workplace settings		8 %	24 %	44 %	24 %
I responded well to e-mails I received related to the project assigned		8 %	22 %	40 %	30 %
I become familiar with the writing format and style of workplace e-mails		4 %	22 %	42 %	32 %
I learned to organize ideas in preparing and writing the executive summary		2 %	26 %	42 %	30 %
I learned how to write reports based on the findings		4 %	6 %	54 %	36 %

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

of the respondents stated that they learned how to brainstorm and forward ideas appropriately with group members after they have undergone PjBL. These ideas give way for searching of current and relevant material related to the project work.

Gathering information from reading materials is a required skill in doing project work. Eighty-eight percent agreed that they were able to understand and gather information for the project, based on the reading materials. Finally, the findings show that 78 % agreed that they learned how to identify the relevant ideas from the reading materials gathered regarding project work. This means that through PjBL, students have acquired relevant reading skills such as skimming and scanning, gathering information and identifying relevant ideas related to the project undertaken by their group. But 22 % need to improve these skills. This denotes that little more than three quarter of the students are sufficiently skillful in collecting information from reading materials and only about a quarter needs assistance in information gathering. Instructors should encourage students to gather information from various resources such as academic books, journals, and articles besides the internet which students often refer to (Table 31.4).

It is not sufficient for a student to obtain a degree alone as employers are looking for more than just knowledge and technical skills of a degree discipline. They particularly value communication skills. Job applicants who can demonstrate that they have developed these skills will have a real advantage. In view of this current situation, project-based learning provides immense opportunities for students to

develop their communication skills as shown in the following findings. A total of 66 % learned to write e-mails related to workplace settings, but there are 24 % students responds in neutral, discuss with some students, their answers are that this skills can study other works not only in project-based learning. In addition, 70 % responded well to e-mails received related to the project assigned. However, 74 % became familiar with the writing format and style of workplace e-mails. (72 %) learned to organize ideas in preparing and writing the executive summary and a large number of students 90 % learned how to write reports based on the findings.

The findings have shown that students greatly benefit in developing their communication skills especially in writing e-mails, executive summary and reports. Lawton and Franc (2009) suggest that communication and language skills can be delivered in project work as in the case of Multilingual Project at the University of Westminster. It is essential that students communicate effectively in order to fulfill the needs of the twenty-first century job market. Archer and Davison (2008) listed communication skills in *Graduate Employability: The Views of Employers* as the highest ranking in the views of employers in London. Similarly, the three key competency qualities required in the Malaysian job market according to the are (i) self-imaging or grooming, (ii) effective communication skills and (iii) English proficiency (Mohamed Khalid Nordin 2009).

As for interpersonal skills, more than half of the respondents, 77 % agreed that they became perceptive and sensitive to the needs of others. When working with others from different social and cultural background, almost 82 % agreed to it while only 18 % were uncertain. In carrying the project work, respondents were required to use both formal and informal language according to different context of discourse; total of 84 % agreed that they have acquired the skill. They have also improved their social skills when they engaged in conversations with employers and employees of a company when undergoing their project. In addition, they have also learned how to interrupt appropriately where 92 % agreed to the statement. Compare with other tables, the findings in Table 31.5 show that more than 56 % of the respondents gave uncertain or neutral answers to the statements (1,2,3) which denotes a significant

Table 31.5 Students' responses on interpersonal skills from project-based learning

Statements	1	2	3	4	5
I became more perceptive and sensitive to the needs of others during group work		6 %	16 %	44 %	34 %
I learned to work successfully with students from different social and cultural groups		4 %	14 %	48 %	34 %
I learned to use formal and informal language in the appropriate context of discourse	2 %	2 %	12 %	52 %	32 %
I improved my social skills by meeting and talking to employers and workers of an organization			8 %	54 %	38 %
I learned how to interrupt appropriately during interactions		2 %	12 %	48 %	38 %

1 strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree

Table 31.6 Means, standard deviations, and correlations

Variable	X	SD	Overall using project-based learning
General benefits	4.1350	.62108	.730**
Teamwork	4.1900	.64198	.837**
Project management	4.1950	.64541	.866**
Communication skills	4.0000	.64270	.840**
Interpersonal skills	4.1600	.62466	.891**

**p < .05

number of students who were unsure if they had acquired the interpersonal skills. This may imply that they were unable to develop their interpersonal skills while undergoing.

Hence, further practice needs to be given to students to enable them to acquire the required interpersonal skills to meet the requirements of the needs of the twenty-first century job market.

Students' perceptions of using Project-based learning are related to general benefits and soft skills (teamwork, Project Management, Communication Skills, Interpersonal Skills)

An examination of correlation among students' overall **benefits and soft skills**, include of teamwork, Project Management, Communication Skills, Interpersonal Skills and overall perception of using Project-based learning is shown in Table 31.6.

The students overall Interpersonal skills yielded a correlation of .891, overall Project management yielded .866, overall communication yielded .840, overall teamwork .837, overall general benefits .730 with the overall students, perception of using Project-based learning. Therefore, there is a significant relationship between each factor and the students overall perception of using Project-based learning.

The total percentage of students who answered 'Agree' and "Strongly Agree" is more than 80 %. The comparison of data for only 'Agree' and 'Strongly Agree' in questionnaires can help the researcher to understand the level of students' agreement toward using Project-based learning. However, according to Table 31.1, the Means of responses to five point Likert Scale is upper than three which shows the high enthusiasm of students toward using project-based learning in teaching and learning.

31.4.3 There Is No Significant Difference Between Different Types of Gender in Term of Using Project-Based Learning

The respondents for the survey are balanced between female and male approximately with 52 % out of 50 respondents are female and 48 % of the respondents are male. *T*-Test is used to find whether there is a significant difference available between the means of different genders or not. Table 31.7 shows the results of *T*-Test analysis on gender.

Table 31.7 The results of T-Test analysis on gender

Paired differences									
Mean different	Std. deviation	Std. error different	95 % confidence interval of the difference		t	df	Sig. (2-tailed)	Levene's test for equality of variances	
			Lower	Upper				F	Sig.
.26286		.16062	-.06009	.58580	1.637	48	.108	.203	.654

The result of *T*-Test analysis shows the Sig. is upper than 0.05 so null hypothesis is accepted. In other words, there is not any significant difference between different types of genders in term of using Project-based learning.

31.5 Discussion and Conclusion

This paper presented findings from a survey on students' perceptions on using Project-based learning (PjBL) in UTM. Three hypotheses were tested that indicate (i) Students' perceptions of using Project-based learning in the training curriculum are related to knowing more about the real world, enjoy, learning more and gaining beneficial; (ii) Students' perceptions of using PjBL promote students to develop soft skills, such as: *Teamwork; Project Management; Communication Skills, Interpersonal Skills.* (iii) There is no significant difference between different types of gender in term of using PjBL in the curriculum.

Overall, findings show that most of the students have positive perceptions of using Project-based learning as a teaching method and agree to learn using the same method in the future. This study has its limitations. The data collection for this research study is from 50 students in UTM who have less number in comparison with the total of students in UTM that is more than 20.000. Therefore, the perceptions of different group such as undergraduate, master or PhD with more experiences can be compared to the result of this research study. Moreover, this research study considers just demographic information and twenty two variable items. Therefore, for future studies more variable can be considered.

Another finding from this study is that employability skills are transferable skills, and the challenges are (1) how to assist students to obtain jobs which will more directly link to their intended professions and (2) how to assist these students to identify the employability skills they are learning in their student work roles and link them to professional goals. As well as the employability skills that are learned in the classroom and through project work, there are other learning opportunities for students to experience workplace situations outside classes. This study concludes that being in a culture of learning and exposure to new people and experiences, project based learning contributes to the development of many soft skills as mentioned above with applications to the workplace. This apparently will fulfill the needs of the twenty-first century job market.

References

- Ahluwalia, G., & Aggrawal, D. (2010). Language learning with internet-based projects: A student-centred approach for engineering students. *ESP World*, 1, 27, 9. Available at <http://www.esp-world.info>
- Archer, W., & Davison, J. (2008). *Graduate employability: The views of the employers*. London: The Council for Industry and Higher Education (CIHE).
- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House*, 83, 39–43.
- Boaler, J. (1999). Mathematics for the moment, or the millennium? What a British study has to say about teaching methods. *Education Week*, March 31, 1999.
- Doppelt, Y. (2003). Implementing and assessment of PBL in a flexible environment. *International Journal of Technology and Design Education*, 13, 255–272.
- enGauge Report. (2003). *21st century skills: Literacy in the digital age*. Naperville/Los Angeles: NCREL and Metiri.
- Grant, M. M. (2002). Collaborative project-based learning and problem-based learning in higher education: A consideration of tutor and student roles in learner-focused strategies. *Meridian: A Middle School Computer Technologies Journal*, 5, 1. Retrieved from <http://www.ncsu.edu/meridian/win2002/514>. On 12 Nov 2013.
- Kloppenborg, T. J., & Baucus, M. S. (2004). Project management in local non profit organizations: Engaging students in problem based learning. *Journal of Management Education*, 28, 610–630.
- Lawrence, A. (1997). Expanding capacity in ESOL programs (EXCAP): Using projects to enhance instruction. In *Literacy harvest/projectbased instruction*. New York, 6(1), 1–9.
- Lawton, J., & Franc, C. (2009). *Employability and enquiry-based learning in languages*. Available at <http://www.llas.ac.uk/resources/paper/3250>
- Markham, T. (2011). Project based learning. *Teacher Librarian*, 39(2), 38–42.
- Moss, Van Duzer, & Carol. (1998). *Project-based learning for adult English language learners* (ERIC Digest). Washington, DC: ERIC.
- Moursund, D. (2007). *Problem-based learning and project-based learning*. Retrieved from <http://darwing.uoregon.edu/~moursund/Math/pbl.html>. 8 Oct 2010.
- NCIHE (1997) *Higher education in the learning society* [Report of the National Committee of Inquiry into Higher Education: 'The Dearing Report']. Norwich: HMSO. Available at <https://bei.leeds.ac.uk/Partners/NCIHE/>
- Ng, P. Y., Abdullah, S. K., Nee, P., & Tiew, F. (2009, June). Employers' feedback on business graduates: An exploratory study in Curtin Sarawak. *International Review of Business Research Papers* 5(4), 306–321.
- Nordin, M. K. (2009). *Enhancing graduate employability: Issues, concerns and the way forward*. Available at <http://khalednordin.com/.../july-21st-2009-Seminar-on-enhancing-graduate-employability-issues-concerns-and-the-way-forward.pdf>
- Pink, D. H. (2005). *A whole new mind: Moving from the information age to the conceptual age*. New York: Penguin Group.
- Rosen, D. (1998). *Inquiry projects*. Available at <http://www2.wgbh.org/mbcweis/lc/alri/I.M.html>
- Sidman-Taveau, R., & Milner-Bolotin, M. (2001). *Constructivist inspiration: A project-based model for L2 learning in virtual worlds*. Retrieved October 5, 2007, from http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/29/cf/ae.pdf
- Thomas, J. W. (2000). *A review of research on project-based learning*. Retrieved from <http://www.autodesk.com/foundation>. On 5 Oct 2010.
- Treleavan, L., & Voola, R. (2008). Intergrating the development of graduate attributes through constructive alignment. *Journal of Marketing Education*, 30(2), 160–173.
- Tretten, R., & Zachariou, P. (1995). *Learning about project based learning: Assessment of project based learning in Tinkertech schools*. San Rafael: The Autodesk Foundation. Unknown. Project-Based Learning Space: Background Knowledge and Theory. Retrieved on 11 Oct 2013.

Chapter 32

Error in Solving Mathematical Word Problem: A Study of Preparatory Diploma Program

Cheong Tau Han, Parmjit Singh, Nurul Akmal Mohd Nasir,
Mohd Adlan Ramly, and Teoh Sian Hoon

Abstract Every year, thousands of SPM candidates graduate from secondary school and get ready to pursue their study in tertiary education. Students have choices to either study in Form six, A-level or foundation courses. One of foundation courses would be preparatory diploma program which offered by a local college. This study is to investigate the effectiveness of the preparatory diploma program and do students who enroll in this course do prepare themselves toward diploma program. Mathematics is the subject that has been chosen to be investigated. Total of 370 students from a local college were randomly selected to participate in this study. They were given a test where the test consists of word problems and non-word problems. The test covers most of the topics they had studied in secondary school and the preparatory diploma program. Later, eleven students were randomly selected to be interviewed after the test. In this study, researcher found that most of students cannot perform in the test as well in the interview. Errors made by students had been analyzed based on Fong schematic model where Fong classified errors into five categories, such as complete schema with errors, incomplete schema with no errors, and incomplete schema with errors, irrelevant solutions and blank solution.

Keywords Mathematics • Word problem • Preparatory diploma program • Fong schematics model

C.T. Han (✉) • P. Singh • N.A.M. Nasir • M.A. Ramly • T.S. Hoon
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: cheongtauhan@salam.uitm.edu.my; parmj378@salam.uitm.edu.my; nurulakmal@salam.uitm.edu.my; mohdadlam@salam.uitm.edu.my; teohsian@salam.uitm.edu.my

32.1 Introduction

Mathematics has been applied widely in various fields and covering wide ranges of activities. However, low achievement in mathematics has alerted government and stakeholders. This has been an obstacle for Malaysian government in attempting to increase the number of graduates especially in the fields of science, technology and innovation to become knowledge workers to sustain the nation and to achieve the title of a developed nation by the year 2020 (Sam et al. 2009).

Mathematics has been recognized by its worth and value. The importance of having a solid background in mathematics and quantitative analysis as prerequisites for admission into university and college areas of study is well recognized. Students' achievements in mathematics in high school have a significant effect on their performance in college and university (Ismail and Awang 2008).

However, TIMMS reported that for the past 12 years, results of mathematics sat by Malaysia students has dropped from rank 16 (year 1999) to 26 (year 2011) out of 64 participation countries. TIMMS also unveil that the average score for the mathematics subjects has also dropped from 519 points (year 1999) to 440 points (year 2011) which was below the international average 500 points (TIMMS 2011; Najib Abd et al. 2011). This has shown that Malaysia mathematics level is below the international level. According to TIMMS report, Malaysian students mostly cannot answer word and thinking problems. Therefore, to overcome this problem, Malaysia government has decided to introduce high order thinking skill (HOTS) into mathematics syllabus.

This study is to investigate the errors made by preparatory diploma students (SPM graduates) when solving mathematical word problems. Those mathematical word problems cover from secondary school problems up to preparatory diploma syllabus.

32.2 Research Question

This study aimed to answer the following questions:

- (i) Does the students able to answer mathematical word problem?
- (ii) What are the mistakes or error made by students when answering mathematical word problems?

32.3 Method

Total of 370 students from a local college were randomly selected to participate in this study. They were given a test where the test consists of word problems and non-word problems. The test covers most of the topics they had studied in

secondary school and the preparatory diploma program. The test consists of total 30 questions inclusive word and non-word problems. Eleven students were randomly selected to be interviewed on the word problems after they sat for the test. Errors made by students had been analyzed based on Fong schematic model (Fong 1995).

32.3.1 *Fong's Schematic Model for Error Analysis*

Fong (1995) schematic model for error analysis is based on the schematic approach for analyzing students' strategies in solving both computational and word problems. Fong defined a schema as the network of interrelationships between different sets of knowledge that constitute a concept and schemata as data structures that represent the generic concepts stored in memory. Fong classifies errors into two levels. The first level is categorized in terms of schematic approach into five categories:

- (E1) complete schema with errors: This type of error arises when an error is made in computation or encoding of information although the problem solver is able to connect the relevant schema to the problems requirement.
- (E2) incomplete schema with no errors: In this type of error, students present some, but not all, of the correct steps in the solution. No actual error is made other than incomplete retrieval of a schema leading to a solution. The problem solver has a limited or insufficient schema or is unable to connect all the relevant information that leads to the solution.
- (E3) incomplete schema with errors: This category of errors differs from the above categories in that the student makes errors such as computation and/or encoding errors in addition to demonstrating an incomplete schema or an inability to connect all relevant schemata.
- (E4) using irrelevant procedures: In this category, the student is unable to retrieve any relevant knowledge or information and apply it to work out the solution. Any knowledge or information that is retrieved has no connection or link to the question, although the problem solver may assume that those pieces of information retrieved are the best solutions without realizing that the connection is erroneous.
- (E5) no solution: this category refers to a solution which has no written response. In the current study, this category includes both blank responses and solutions where only pieces of information taken from the question are written down without any further work, such as $1 \text{ hour} = 1/3$ of the trip. In terms of schematic explanation, the student is unable to connect or relate his available schema to the information obtained from the question (Fong 1995).

Fong (1995) model emphasizes the importance of schematic knowledge to mathematical problem solving. He pointed out the second level of errors could be sub-

sumed under the E1, E3, and E4 categories. He further argued that a pupil must first overcome the first level of errors in order to successfully solve problems. Therefore, first level errors will be analyzed in this study.

32.4 Results and Analysis

Table 32.1 shows the percentage of error made by students during the interview session for particular questions respectively while Table 32.2 shows the total percentage error made by students during the interview session.

Overall, there are total of 11 interview respondents were randomly selected to participate in this study. During the interview session, students were found to make mistakes during the test and those mistakes had been classified into five categories based on Fong (1995) Error Analysis Schematic Model. For the details, refer to the descriptions for each question.

From Table 32.2, error that most students made in the interview are as follows (in ascending order), E4 (using irrelevant procedures), E5 (no solution), E1 (complete schema with errors), E3(incomplete schema with errors) and E2(incomplete schema with no errors).

Obviously, most of students made error E4 (34 %) where they unable to retrieve any relevant knowledge or information and apply it to work out the solution, follow by error E5 (18 %) where they do not attempt to solve the question and left the solution to be blank. Next, error E1 is third type of error where students made most. In error E1, 15 % of students made mistake in their calculation and lead to wrong answer, and 13 % of students did not complete his working plus they made mistake in their calculation. Lastly, 5 % of students made error E2 where they only show half way of their working and did not precede it.

The following sections discuss type of errors made by students in details. Owing to some constraints, only few questions and respondents' results will be discussed. The interview was conducted in Bahasa Malaysia. Translation is made and written in italic beneath the interview transcript.

Table 32.1 Percentage of error for each interviewed question made by students

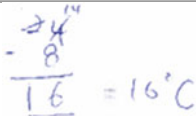
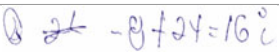
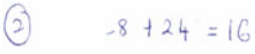
Error	Percentage (Count)				
	Q2	Q4	Q12	Q23	Q29
E1	36 % (4)	36 % (4)	18 % (2)	0 % (0)	0 % (0)
E2	0 % (0)	9 % (1)	0 % (0)	0 % (0)	0 % (0)
E3	0 % (0)	0 % (0)	0 % (0)	0 % (0)	0 % (0)
E4	0 % (0)	27 % (3)	64 % (7)	91 % (10)	100 % (11)
E5	9 % (1)	0 % (0)	9 % (1)	9 % (1)	0 % (0)
Correct	55 % (6)	27 % (3)	9 % (1)	0 % (0)	0 % (0)
Total	100 % (11)	100 % (11)	100 % (11)	100 % (11)	100 % (11)

Table 32.2 Percentage of error made by students during the interview

Error	Percentage (Count)
	Total
E1	18 % (10)
E2	2 % (1)
E3	0 % (0)
E4	56 % (31)
E5	5 % (3)
Correct	18 % (10)
Total	100 % (6)

Question 2

The lowest temperature on Sunday morning was -8°C . Later that same day the temperature reached a high of 24°C . By how many degrees Celcius did the temperature increased?

Respondent	Interview	Respondent solution
R2	... Tolakkan 24-8... Negatif menunjukkan sama ada ia hanya sejuk ataupun panas.... <i>(Negative sign shows either it is cold or hot)</i>	
R6	...Sebab soalan nak peningkatan suhu. Soalan nak peningkatan suhu, sebab itu saya tambah 24? <i>(Since the question asked for temperature increase, therefore I plus with 24)</i>	
R7	...Saya tidak faham dan tidak tahu <i>(I don't know)</i>	2) tak tahu
R11	I: Bagaimana anda tahu kadar peningkatan adalah 16? Kenapa anda buat negative 8 tambah 24? R: Kerana suhu meningkat...	

From the interview carried, notice that respondent R7 do not understand the question. So, he left it blank (E5). For respondents R2, R6 and R11, they made mistake in operation (E1), where they perform $-8+24=16$ or $24-8=16$ as they mentioned the temperature increased from -8 to 24 . Moreover for R2, he did mention the negative sign is to show whether the object is cool or hot. Overall, 6 out of 11 respondents do answer the question correctly.

Question 4

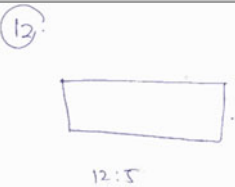
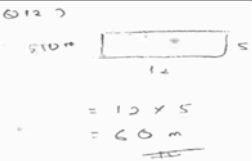

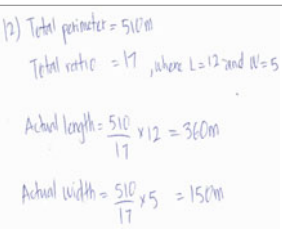
Ms Chin went to the doctor at 7:15 pm. She reached the clinic $\frac{1}{3}$ hour later. She was in the clinic for $\frac{4}{5}$ hour. She takes another 25 min to reach home. What time did she reach home?

Respondent	Interview	Respondent solution
R2	<p>...Tukar 7.15 ke system 24 jam. Bagaimana awak tukarkan 7.15 ke system 24 jam? 7.15, system 24 jam ialah 19.15... Tukarkan 1/3 jam ke minit, 1/3 darab 60, dapat 20 minit. Lepas tu, tukarkan 4/5 jam kepada 48 minit, kemudian tambahkan semua. Jumlah jam dapat waktu 8.23 pm</p> <p><i>(This respondent did not complete the calculation)</i></p>	
R6	<p>...Tetapi kenapa anda tersekat dan berhenti pada operasi tambah? Saya tidak tahu untuk tukarkan. Anda tidak tahu tukarkan apa?Jam tu ke? Maksudnya daripada jam ke minit anda tidak tahu tukarkan? Ya.</p> <p><i>(I do not know how to convert from hour to minit)</i></p>	
R7	<p>...Saya boleh buat tetapi tidak pasti dengan jawapan saya.</p> <p>...Saya rasa 1/3 jam bersamaan dengan 20 minit, manakala 4/5 jam bersamaan dengan 28 minit, jadi, dia ambil masa untuk pulang ke rumah sebanyak 25 minit. Jadi tambah semua jumlah untuk tahu berapa banyak masa dia ambil untuk sampai ke rumah.</p> <p><i>(This respondents made mistake in converting 4/5 hours equal 28 minutes)</i></p>	

Based on the interview for question 4, notice that respondents R2 and R7 able to understand the need of question and able to show their working but they did mistakes in their calculation. Therefore they couldn't get the correct answer. This is error type 1 (E1). Respondent 2 made error E2 where he fails to find the final answer but the working he showed has no errors. Respondents R4 and R6 did error E4 where they do not know how to extract the information to be used in their computation. They only show partial and copy information from the question without continues solve it. Overall there are 30 % students able to solve this question correctly.

Question 12

The perimeter of a rectangular plot of land is 510 m. Given the ratio of the length to width of the land is 12 to 5.. Find the actual dimension (length and width) of the land.

Respondent	Interview	Respondents solution
R1	<p>Saya tak dapat jawab...Boleh baca soalan? Boleh. Tapi saya tak faham"given the ratio of the length to width"...Apakah maksud perimeter? Jumlah petak semua adalah 510. Berdasarkan soalan, apakah maksud ratio? Ratio panjang ke with 12 ke 5. Apa yang anda faham mengenai ratio 12 ke 5? Saya tak faham 12 ke 5. Adakah awak faham maksud dimension? Bentuknya lah area. Jadi adakah anda faham kehendak soalan? Tidak....</p> <p><i>(This respondent can read the question, can understand what is perimeter, but did not understand what is ratio and the need of questions)</i></p> <p>Type of Error: E4</p>	
R3	<p>Adakah anda faham kehendak soalan? Actual dimension. Jadi anda tidak faham apakah actual dimension"? Ya...Jadi anda tak faham kehendak soalan"? Kalau soalan nak ukuran sebenar, anda boleh buat? Tak boleh</p> <p><i>(This respondent did not understand the question)</i></p> <p>Type of Errors: E4</p>	
R4	<p>Saya tak berapa faham soalan ini. Jadi, boleh anda terangkan sedikit apakah informasi dalam soalan ini? Perimeter untuk rectangular. Apakah itu rectangular. Segi empat tepat. ..jadi adakah panjang dan lebarnya adalah 12 dan 5? Length 12 dan width adalah 5.</p> <p><i>(This respondent has said that the length is 12 and width is 5)</i></p> <p>Type of Errors: E4</p>	
R7	<p>...Saya tidak faham dan tidak tahu untuk buat...Soalan memberikan nisbah panjang tetapi saya tidak faham dari berapa sampai berapa? Apa yang dimaksudkan "find the actual dimension"? Saya tidak faham. Saya tidak tahu kira.</p> <p><i>(This respondent do not understand the meaning of actual dimension)</i></p>	<p>12) tak faham</p>
R10	<p>...Sebab jumlah ukur lilit adalah 510, jadi untuk mencari jumlah sebenar panjang, 510 bahagi dengan jumlah nisbah, darab dengan nisbah panjang. Maksudnya, 510/17 darab dengan 12? Kenapa anda harus darab dengan 12? Sebab nisbah panjang adalah 12. Jadi akan dapat jumlah sebenar untuk panjang. Kemudian, anda cari jumlah sebenar lebar? Menggunakan kaedah yang sama tetapi darab dengan 5...</p>	

For question 12, respondent R10 did error E1 where they did mistake in calculation (division). Seven respondents (R1, R3 and R4) did make error E4 where they use irrelevant information's which they think the information might be useful in solving the question. Majority of them had problem in understanding the words "ratio". One respondent, R7 did not answer the question and leave it blank.

Question 23

Eva and Alex want to paint the door of their garage. They first mix 2 cans of white paint and 3 cans of black paint to get a particular shade of grey. They add one more can of each. Will the new shade of grey be lighter, darker or they are the same?

Respondent	Interview	Respondent solution
R1	<p>Sama. Kenapa? Sebab dia tambah satu tin bagi hitam dan putih. Kalau cat yang ditambah adalah putih sahaja, makin cerah warnanya, tapi kalau car warna hitam yang ditambah makin gelap. Tapi sekarang ditambah satu hitam dan satu putih. Warna kelabu akan sama</p> <p><i>(This respondent said the new shade of grey are the same because the same amount of black and white color were mixed)</i></p>	
R2	<p>Sama. Kenapa sama? Sebab nisbah yang sama. Adakah sebab awak nak cakap 2/3 sama dengan 3/4? Ya</p> <p><i>(This respondent said the ratio 2/3 and 3/4 are the same)</i></p>	
R3	<p>Sama. ...Kalau contohnya 2 tin putih ini ditambah lagi 2 tin aka nada kesannya. Tapi sekarang setiap satu cat ditambah satu. Jadi tak akan bagi apa-apa effect. Hasilnya tetap kelabu. Kelabu yang sama? Taka da yang lebih gelap atau cerah? Tidak</p> <p><i>(This respondent said the new shade of grey are the same because the same amount of black and white color were mixed)</i></p>	
R5	<p>Jawapannya sama. Kenapa jawapan anda adalah sama? Mula-mula cat ini ada 2 putih dan 3 hitam, kemudian ditambah 1 bagi setiap satu, Ia sama sebab ditambah dengan jumlah yang sama. Jadi, nisbahnya adalah sama? Ya. Jadi adakah kelabu pertama dengan keduanya adalah sama? Ya</p> <p><i>(This respondent said the new shade of grey are the same because the same amount of black and white color were mixed)</i></p>	

For question 23, none of the students able to answer the question. They made error E3 where their workings were incomplete with errors. Only respondent R4 and R6, initially, get the correct answer, but after being interviewed on how they got the answer, they changed their answer. Majority of them understand the question, but when come to concept ratio, they failed to get it right.

Question 29

Rahman takes 20 h to paint a house, where Ah Beng takes 30 h. How long will it take for them to paint a house if they work together?

Respondent	Interview	Respondent solution
R1	<p>Saya confuse dengan soalan ini. Saya tambahkan 20 jam dengan 30, jadi 50 jam. Sebab kerja sama-sama saya bahagikan dengan 2</p> <p><i>(This respondent confuse with the question. He sum up two working time and find the average for it)</i></p>	
R2	<p>...Saya tolak. Kenapa? Untuk cari perbezaan. Jadi daripada perbezaan hasilnya sama? Ya. Kenapa toalk? Rahman 20, Ah Beng 30, jadi beza tu lah mereka boleh siapkan</p> <p><i>(This respondent find the difference of the working time as he said the difference of working time equal to time to complete)</i></p>	
R6	<p>Saya tidak tahu bagaimana nak buat...Sebab saya tidak tahu bagaimana untuk menyelesaikan jam. Mengapa? Saya tidak tahu mengenai jam. Kenapa? Diberikan 20,30....Mungkin tolakkan sahaja. Kenapa? Untuk kurangkan jam</p> <p><i>(This respondent do not understand the question and hence he found the difference of the working time)</i></p>	
R9	<p>Saya dapat 60 jam. Soalan perlukan berapa masa yang digunakan oleh dua orang untuk cat rumah itu. Jadi saya tambahkan kedua-dua jam.</p> <p><i>(This respondent find the total of the working time and he also did mistake in sum up 20 and 30)</i></p>	
R10	<p>Kenapa tambah? Sebab berapa lama mereka boleh CAT RUMAH. kEnapa bahagi 2? Saya bahagi 2 sebab hendak tahu nilai point</p> <p><i>(This respondent find the average of the working time as he wanted to know the value)</i></p>	

Three respondents, R1, R9 and R10 did the same mistake where they find the average of the hours spends, two respondents, R2 and R6 mention the difference of the hours is the total time spends to paint the house. All of them made type of error E4.

32.5 Conclusion

This error analysis indicated that many students had difficulties in solving mathematical word problem which incorporate real life problems and application. In some problems, more than half students could not reach the correct answer. More often, they made first level E1, E3, E4 and E5 errors. This indicates they did not have a complete schema for solving the problems.

Based on the error analysis, difficulties faced by students are listed as below:

1. Students possess inadequate knowledge to define mathematical problems. To overcome this, teacher or instructors have to provide verbal instructions to students until students able to meet the real-world problem.
2. Students do not have sufficient experience in solving word problem. Therefore, teacher must be able to teach students to define problem and develop a conceptual plan.
3. Students do not know how to use operators such as addition and subtraction. To address this problem, teachers have to teach students to see the words from another angle in problems.
4. Some students understand the theoretical concepts, but they do not know how to solve the problem. Teacher should teach word problem from the beginning of their training on an actual procedure.

References

- Fong, H. K. (1995). Schematic model for categorising children's errors in mathematics. *Hiroshima Journal of Mathematics Education*, 3, 15–30.
- Ismail, N. A., & Awang, H. (2008). Differentials in mathematics achievement among eighth-grade students in Malaysia. *International Journal of Science*, 6(3), 559–571. doi:[10.1007/s10763-007-9109-4](https://doi.org/10.1007/s10763-007-9109-4).
- Najib Abd, M., Ghagar, R. O., & Mohammadpour, E. (2011). Multilevel analysis of achievement in mathematics of Malaysian and Singaporean students. *Journal of Educational Psychology and Counseling*, 2(11), 285–304.
- Sam, H. K., Ngiik, T. L., & Usop, H. H. (2009). Status of mathematics teaching and learning in Malaysia. *International Journal of Mathematical Education in Science and Technology*, 40(1), 59–72(14).
- TIMMS (2011) <https://nces.ed.gov/TIMSS/>

Chapter 33

Towards Inclusive Education in Malaysian Universities: Addressing the Barriers, Challenges and Needs of Special Educational Needs Learners

Roslinda Alias, Nor Aziah Alias, and Abu Bakar Ibrahim

Abstract Inclusive education is not a new agenda in the education system in Malaysia, including universities. In this study, experiences of the special educational needs (SEN) learners in Malaysian universities are explored. Sixty-six SEN learners who are currently studying in selected Malaysian Universities participated in this study. The study found that most of the participants faced barriers and challenges as learners in IHLs such as during their teaching and learning, during their fieldworks, during their assessments and when dealing with the university staff. In addition, the SEN learners also highlighted on their needs to enhance their functions as learners in universities such as the improvement of campus facilities that are barrier free, getting more support and awareness of the university staff and other able learners as well as the needs of facilities and technologies specifically for them.

Keywords Inclusive education • Universities • SEN learners • Challenges and needs of SEN learners

33.1 Introduction

Inclusive education movement in Malaysia started in the 1990s in which it is more focused on special educational need learners (Mohd Ali et al. 2006). According to the Malaysian Education Act, 1996 in (Special Education) Regulations 2013, special educational needs (SEN) learner is one “who is certified by a medical practitioner, an optometrist, an audiologist or a psychologist, as the case may be, whether

R. Alias (✉) • N.A. Alias • A.B. Ibrahim
Faculty of Education, Universiti Teknologi MARA, Campus Section 17,
40200 Shah Alam, Selangor, Malaysia
e-mail: linda512@salam.uitm.edu.my; noraz112@salam.uitm.edu.my;
abuba710@salam.uitm.edu.my

in service of the government or not,” (p. 9) as a student having the following condition(s): (1) Visual disability; (2) Hearing disability; (3) Speech disability; (4) Physical disability; (5) Learning difficulties; or (6) Any combinations of the disabilities, or disabilities and difficulties referred to number 1 to 5.

One of the aims of inclusive education movement in Malaysia is to support the World’s Declaration on Education for All held in Jomtien, Thailand (UNDO et al. 1990), The Salamanca Statement and Framework for Action on Special Needs Education (UNESCO 1994), the Dakar Framework of Action (UNESCO 2000), the Biwako Millennium Framework for Action (UNESCAP 2011) as well as the Convention on the Rights of Persons with Disabilities and Optional Protocols (United Nations 2006). The continuous efforts towards this movement could be seen from the Malaysian Education Development Master Plan 2006–2015, which emphasizes on the equity of education for all Malaysians including special educational needs learners (SEN).

33.1.1 The Needs of Inclusive Education in Universities

Universities should also create an inclusive environment to all learners regardless of their background, race, ability and gender so that nobody will be left out in pursuing higher education. Inclusive learning environment will foster the SEN learners’ learning processes in higher education.

Inclusive education means providing equal opportunity in education to all learners “regardless of their physical, intellectual, social, emotional, linguistic or other conditions” (UNESCO 1994, p. 6). Corbett (2000) highlighted that inclusive education “is about fostering a learning community which treats individuals with dignity and respect and it is about celebrating difference” (p. 73).

Adams and Holland (2006) emphasized that SEN learners should pursue their study in higher education institutions because the degree obtained from the university will increase their opportunities to get better jobs. Two important factors which could promote sustainability of SEN learners in higher education as stressed by Adams and Holland (2006) that are educational aspirations and trouble-free transition. Educational aspirations according to Adams and Holland (2006) may come from many individuals such as parents, teachers, friends and learning environments. It may come in many forms such as a supportive parents and teachers, helpful friends as well as inclusive environment.

Trouble-free transition in education means the SEN learners face no barriers in their education journey starting from pre-school up to university level. Among the barriers as highlighted by Adams and Holland (2006) that could hinder the smooth education transition in universities for the SEN learners is difficulty in adapting life away from family and friends as well as difficulty in accommodating to different learning styles in each level of education.

In addition, Fernie and Henning (2006) proposed that to ensure inclusive environment could be materialized in the university, SEN learners should be aware of

and familiar with services offered by the university so that they will benefit from them. Besides that, they should also develop good study habits so that they can adjust with the new learning environment. The role of lecturers is also emphasized in which their support on the inclusive education agenda is really needed.

In addition, the roles of technology could not be denied in creating inclusive environment as one of the vital supports for SEN learners to survive in higher education as highlighted by Ommerborn and Suemer (2001) and Alias et al. (2013). Ommerborn and Schuemer (2001) stated that e-learning could create an inclusive learning climate especially when the environment such as building and method of teaching and learning does not promote so called inclusive learning for the SEN learners.

However, Pearson and Kopyy (2006) asserted that if the design and development of teaching aids and materials were not well prepared, e-learning is meaningless for the SEN learners. The unplanned learning materials will lead to difficulties for the SEN learners to access e-learning. Course developers should be sensitive to the needs of the SEN learners. Pearson and Kopyy (2006) suggested that assistive technology should be integrated in designing the learning materials so that everybody including SEN learners can access them electronically.

Newland et al. (2006) proposed that virtual learning environments (VLEs) could be adapted to create an inclusive environment as it could support “effective and enjoyable learning” for disabled learners in higher education. Healey et al. (2006) agreed with Newland et al. (2006) and added that VLE provide flexibility in teaching and learning. VLEs which is also referred as LMS (Learning Management System) could be utilized by combining face-to-face and online learning. This method is also known as blended learning.

Meanwhile, Roslinda Alias et al. (2013) suggested the use of tablets, the improvisation of the existing learning management system (LMS) and the utilization of Web 2.0 in teaching and learning could be considered in creating inclusive atmosphere in higher education particularly for SEN learners.

33.1.2 Barriers of Inclusive Education

To ensure the presence of inclusion in education, barriers and challenges should be removed. Adams and Holland (2006) highlighted that SEN learners faced extra challenges and barriers in pursuing their education. Pliner and Johnson (2004) identified three obstacles to inclusion in higher education including physical accessibility, curriculum and instruction accessibility as well as negative attitudes. While Adams and Holland (2006) classified four barriers and challenges encountered by the SEN learners which could hinder the process of inclusion i.e. structural, organizational, behavioural and attitudinal.

Mitchell (2008) examined the barriers of inclusive education in Asia and South Africa and found numerous factors as follows: (1) Large classes; (2) Negative attitudes; (3) Examination-oriented education system; (4) Lack of support services; (5)

Inflexibility of teaching methodologies; (6) Medical model of disability dominated the assessment; (7) Lack of parental involvement and (8) Lack of clear national policies.

In Malaysia, one of the main stumbling blocks for SEN learners to pursue their studies to the higher levels of education is poor facilities in the institutions of learning (Ta 2011). Ta (2011) identified two main challenges encountered by SEN learners in pursuing education which are (1) non-conducive buildings and surroundings and (2) poor access to public transportation.

Ainul Jaria Maidin (2012) concurred with Ta (2011) and added even though Malaysian government put much emphasis on the issues related to PWDs, yet they still encounter challenges and barriers in terms of accessibility to the fact that facilities offered in institution of learning, work setting, public transportation and public facilities are “beyond their reach”.

In addition, Toran et al. (2009) in their study among 11 SEN learners in one Malaysian university, found that the facilities on the campus are not SEN-friendly. This is congruent with a study by Salleh and Hijrah Mahani (2010), Arifin and Mahmud (2010) as well as by Alias and Alias (2012).

The Director of Department for the Development of Persons with Disabilities also emphasized that negative attitudes still exist towards the PWDs in Malaysia which becomes an obstacle for the PWDs to co-exist in the so-called ‘normal’ society (Mohd Shahar 2013).

This is congruent with the study done by Salleh and Hijrah Mahani (2010) on SEN learners from two public universities in Malaysia. The study found that among the challenges faced by SEN learners are the normal learners’ attitudes towards them (SEN learners). They find it difficult to make friends with normal learners as most of the normal learners would avoid them. A study conducted by the Ministry of Higher Education (2011) showed a similar result as the SEN learners felt that their normal coursemates isolated them.

In addition, SEN learners also faced difficulties in teaching and learning processes in higher education. Hasnah Toran et al. (2009) discovered that services provided by the university are not really flexible to cater to the needs of SEN learners. A qualitative study on eight SEN learners from Malaysian public IHLs by Alias and Alias (2012) revealed the SEN learners encountered challenges in the teaching and learning including the lack of awareness on SEN needs among academic staff and administrative staff.

33.2 The Study

This study used a cross-sectional survey design. A set of questionnaire distributed to explore the experiences of SEN learners in selected universities in Malaysia. The study thus sought to answer the following questions:

- (1) What are the barriers and challenges faced by the special educational needs (SEN) learners in pursuing their study at the universities in Malaysia?
- (2) What are the needs of SEN learners at the Malaysian universities?

33.2.1 Population

The target population of the study is all SEN learners who were studying in Malaysian public universities in Peninsular Malaysia. According to data from Education Planning and Research Division (EPRD), Ministry of Higher Education, from the year 2008–2010, there were 1,117 SEN learners enrolled in Malaysian public universities in Peninsular Malaysia.

33.2.2 Sampling

Sixty-six SEN learners with a variety of disabilities from eight Malaysian public universities in Peninsular Malaysia participated in this study. This include the blind and partially sighted, The selection of the eight universities was based on the three categories of universities in Malaysia that are Research Universities, Comprehensive Universities and Focused Universities.

The convenient sampling method was employed in the study. Out of 358 sets of questionnaires distributed, only 66 SEN learners returned their feedbacks of which 34 of them were males and 32 were females. This is due to certain limitations such as the reluctance of SEN learners to get involved in the research related to disabled and the different approach of identification of SEN learners in each university. In addition, only the SEN learners who are registered with the Social Welfare Department with a Special Disabled Card (Kad OKU) were chosen to take part in this study. On top of that, only participants who had signing the inform consent form provided in the questionnaire were included in the study.

33.2.3 Instrument

A set of questionnaire was adapted from the GDN II Disability Questionnaire by Healey et al. (2004) for this study. As the target participants of the study were SEN learners in Malaysian public IHLs, the questionnaire was in bilingual version i.e. English language and Malay language.

To answer Research Question 1 pertaining the barriers and challenges of SEN learners faced in IHLs, all 21 items were in the form of four Likert-scale responses from ‘Strongly Agree’, ‘Agree’, ‘Disagree’ to ‘Strongly Disagree’. In addition to each Likert-scale response, the SEN learners were also given an optional space to explain their answers. For the Research Question 2, the SEN learners were required to respond to open-ended questions relating to their needs as SEN learners in IHL.

The questionnaire has been validated by two prominent international experts in Special Education and Inclusive Education. Revision of the instrument has been made upon getting the feedback from the experts. Then the pilot study among the SEN learners was carried out. Revision and modification of the instrument were made based on the responses of the SEN learners before the instrument was ready to be distributed to the respondents in the study.

33.2.4 Data Collection Procedures

Before the study was conducted, approval from the Ministry of Education (formerly known as Ministry of Higher Education) was obtained. In addition, permission was also sought from the Ministry of Higher Education to get the latest SEN learners data from the Malaysian public universities.

Later, the eight selected university authorities were contacted to seek approval to conduct the research. Upon getting permission from the selected university authorities, (depending on each IHL policy) the researcher then requested a complete list of SEN learners from the Student Affairs Department and Counselling Department of the respective universities.

The participants were informed of the objectives of the study. In addition, the researcher notified them that the information provided is highly confidential and would be used only for the purpose of the research. Then they were requested to complete the inform consent form provided before completing the questionnaire. Upon the completion of the questionnaire, they were requested to return their responses to the appointed person in-charge according to their respective university.

33.3 Results

33.3.1 Research Question 1: What Are the Barriers and Challenges Faced by the Special Educational Needs (SEN) Learners in Pursuing Their Study in the Universities in Malaysia?

Four major issues related to barriers and challenges faced by SEN learners in universities have been identified. They are teaching and learning, fieldwork, assessment and experiences in dealing with the university staff.

As presented in Table 33.1, from eight questions on the disability-barriers faced by the SEN learners in Malaysian universities in teaching and learning, over half of the SEN learners reported that they faced difficulties (1) during lectures and (2) in on-campus laboratories, workshops, and studios. Besides, nearly half of the participants of the current study informed they had difficulties in using (1) technical facilities (such as computers, multimedia, audio/visual equipments and photocopy machines), (2) university libraries, (3) other learning resources (such as lecture hand outs, modules, computer assisted instruction packages, learning management systems) and learning facilities (classrooms, hostels). Besides, the SEN learners also reported to have challenges in accessibility due to their conditions.

The majority of the SEN learners were worried that their conditions will affect their fieldwork experience. The independent fieldwork experience was the crucial issue among the SEN learners as compared to residential fieldwork experience and non-residential fieldwork experience as presented in Table 33.2.

Table 33.1 Disability-barriers in teaching and learning

Details	Percentages				Total
	Strongly agree	Agree	Disagree	Strongly disagree	
(i) I have faced disability-related barriers which have impacted on my learning experience in lecture	22.7	36.4	34.8	6.1	100
(ii) I have faced barriers related to my condition which have impacted on my learning experience in on-campus laboratory, workshop, studio and / or practical work.	21.2	34.8	31.8	12.1	100
(iii) I have faced barriers related to my condition which have impacted on my learning experience in on-campus classes such as tutorials and seminars	4.7	42.2	42.2	10.9	100
(iv) I have faced barriers related to my condition which have impacted on my use of the University library(ies)	9.2	40.0	35.4	15.4	100
(v) I have faced barriers related to my condition which have impacted on my use of technical facilities (including computers, multimedia, audio/visual equipment, photocopying)	4.5	37.9	40.9	16.7	100
(vi) I have faced barriers related to my condition which have affected my use of learning resources (such as lecture handouts, computer assisted instruction – CAI packages).	12.1	24.2	45.5	18.2	100
(vii) I have faced barriers related to my condition which affected my use of other learning facilities (for example classroom and hostel).	7.6	39.4	39.4	13.6	100
(viii) I have faced barriers related to my condition which affected my accessibility to the university facilities	7.6	39.4	43.9	9.1	100

As shown in Table 33.3, less than half of the participants reported they faced difficulty due to their conditions across all type of assessments. Yet, this does not mean this issue is trivial. The most challenging assessments according to the SEN learners were written examination, followed by other types of examination, oral presentation and written coursework. The multiple choice questions (MCQ) was the less problematic assessment according to the SEN learners.

In addition, when SEN learners were asked on their experiences with the IHL staffs including the lecturers and the support staff, more than half of the SEN learners did not have any bad experiences with the IHL staffs. The SEN learners reported that the IHLs staffs were helpful and supportive whenever they approached the staff particularly related to their conditions.

Table 33.2 Disability-barriers in fieldwork

Details	Percentages					Total
	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable	
(i) Before I started the course, I was concerned that my condition would affect my experience of fieldwork.	28.8	30.3	27.3	7.6	6.1	100
(ii) My learning experience in residential fieldwork (e.g. out of the campus fieldtrip or overseas fieldtrip) has been affected by my condition.	12.1	13.6	39.4	18.2	16.7	100
(iii) My learning experience in non-residential fieldwork (e.g. a half-day or one day fieldtrip as part of a module) has been affected by my condition.	7.7	18.5	41.5	24.6	7.7	100
(iv) My learning experience in independent fieldwork (e.g. researching for an assignment or dissertation/thesis) has been affected by my condition.	21.5	23.1	30.8	20.0	4.6	100

Table 33.3 Experiences of assessments

Details	Percentages					Total
	Strongly agree	Agree	Disagree	Strongly disagree	Not applicable	
(i) I have faced barriers related to my condition which have affected my experience of the written examination	3.1	29.2	50.8	16.9	0	100
(ii) I have faced barriers related to my condition which have affected my experience of the other types of examination	6.8	16.9	22.0	10.2	44.1	100
(iii) I have faced barriers related to my condition which have affected my experience of the oral presentation	1.5	16.9	60.0	21.5	0	100
(iv) I have faced barriers related to my condition which have affected my experience of the written coursework	1.5	15.4	67.7	15.4	0	100
(v) I have faced barriers related to my condition which have affected my experience of the multiple choice questions (MCQ)	1.5	7.7	67.7	23.1	0	100

33.3.2 *Research Question 2: What Are the Needs of SEN Learners at the Malaysian Universities?*

33.3.2.1 Needs and Suggestions on the University Facilities

Five suggestions were proposed by the SEN learners under the university facilities as follows:

- (1) The facilities should be barrier free and accessible,
- (2) The suitability of the classroom and hostel locations for the SEN learners,
- (3) The hostel and classroom conditions should be SEN-friendly,
- (4) The provision of sport facilities for SEN learners, and
- (5) The improvement of the current university facilities.

33.3.2.2 Needs and Suggestions on the University Support Services

In terms of the SEN needs and suggestions for university support services, nine suggestions proposed by the SEN learners as below:

- (1) University support system
- (2) Special counselling services
- (3) Motivational programmes for SEN learners
- (4) Career talk and job preparation for SEN learners
- (5) The existence of the Special Department
- (6) Soft skills and development programmes for SEN learners
- (7) Special officer to handle the SEN learners matters and issues
- (8) Special services for the SEN learners including special briefing on the campus setting, special awareness program for the SEN learners to help them understand their rights in the university as well as mobility classes to familiarize the SEN learners with the campus setting especially for the blind, partially sighted and those with mobility difficulties.

33.3.2.3 Needs and Suggestions on the University Staff

Six of the SEN learners who responded to the open-ended questions pertaining on their needs and suggestions to the university staff stated that both academic and support staff are helpful and supportive. Nevertheless, nine SEN learners reported that awareness and understanding of the SEN learner issues are still lacking among the university academic and support staff. The SEN learners also requested that the university staff to be more helpful, supportive and friendly towards them.

Thus, to create awareness and understanding among the university academic and support staff, awareness programmes were proposed by the SEN learners. Fifteen SEN learners suggested that a special course or programme should be conducted to

expose the university staff about the SEN learner including the challenges and barriers faced by the SEN learners in and off the campus, their needs, their rights as well as how to handle and deal with them. Through awareness programmes, the university staff will support and lend their hands to the SEN learners.

33.3.2.4 Needs and Suggestions on the Relationship with non-SEN Learners

Even though eighteen responses showed that SEN learners were in good relationships with their non-SEN friends, not all non-SEN learners are aware and understand the SEN learner issues.

There were comments on the attitudes of the non-SEN learners for instance they should be more friendly, supportive and helpful towards the SEN learners. There was a case in which non-SEN learners humiliated the SEN learners in public such as at the bus station, as reported by the participant in the study. The worst scenario was when social media such as Facebook and Twitter were misused by the non-SEN learners to disgrace their SEN friends.

Hence, awareness programmes were proposed to be conducted among the non-SEN learners. Through awareness programmes, the non-SEN learners will be exposed to the issues, challenges and barriers faced by their SEN friends. Some of the SEN learners suggest for the university authority to conduct awareness programmes.

Facilities and Technologies for SEN Students

Based on the SEN learners responses, it was found that additional support services, facilities and technologies should be provided in the Malaysian Universities to cater to the needs of SEN students. This is mainly because the participants have different disabilities and their needs are different according to their conditions. Among the facilities and technologies needed are listed in the Table 33.4.

33.4 Discussion

The findings of this study show that SEN learners faced barriers and challenges in pursuing their study in universities. These include physical facilities and learning support. Awareness among lecturers and others involved in interacting with the SEN learners is paramount in ensuring their experience in higher education are less agitating. Despite the small number of SEN learners as compared to mainstream learners, their inclusion into the learning environment is not to be taken lightly.

Table 33.4 Facilities and technologies needed by the SEN learners according to their disabilities

		Categories of disability				
		Blind	Partially sighted	Cerebral Palsy	Handicapped (hand)	Wheelchair (mobility)
Facilities/ technologies	E-book	√				
	Soft copy handouts	√	√			
	Magnifier		√			
	Braille learning materials	√				
	Ramps and handle bars			√		√
	Special Toilets	√	√	√	√	√
	Good Audio system	√	√			
	Computer/Laptop	√	√			
	Audio Recorder	√	√			
	Special Parking			√	√	√
	Special Lift	√	√	√		√
	Special software	√	√	√		

33.5 Conclusion

The authors recommend that more studies to be conducted in this area and it is also suggested that each university authority pay greater attention to support these learners. In lieu of current technological advances, much need can be done to support and guarantee the academic success of these learners.

References

- Adams, M., & Holland, S. (2006). Improving access to higher education for disabled people. In M. Adams & S. Brown (Eds.), *Towards inclusive learning in higher education: Developing curricula for disabled* (1st ed., pp. 10–22). New York: Routledge.
- Alias, R., & Alias, N. A. (2012). Inclusive education in Malaysian institutes of higher learning: Experiences of special educational needs students. In M. Mokhtar, M. Hanafi, S. Bari, Z. Alimin, & W. Gunawan (Eds.), *Seminar Internasional Pasca Siswazah Pendidikan Khas UKM-UPI Siri II 2012* (pp. 1163–1173). Bangi: Faculty of Education UKM.
- Alias, R., Alias, N. A., Ibrahim, A. B., & Jalaluddin, J. (2013). Proposed technology solutions for Special Educational Needs (SEN) learners: Towards inclusive education in Malaysian universities. *International Journal of Information and Education Technology*, 3(2), 206–210.
- Arifin, R., & Mahmud, Z. (2010). Facilities and accessibility for the disabled at institutions of higher learning in Malaysia. *Malaysian Journal of Sport Science and Recreation*, 6(2), 13–24.
- Corbett, J. (2000). Journeys in inclusive education: Profiles and reflections. In P. Clough & J. Corbett (Eds.), *Theories of inclusive education* (1st ed., pp. 70–73). London: Paul Chapman Publishing Ltd.

- Education Act, 1996 (Special Education: Regulation 2013).
- Fernie, T., & Henning, M. (2006). From a disabling world to a new vision. In M. Adams & S. Brown (Eds.), *Towards inclusive learning in higher education: Developing curricula for disabled* (1st ed., pp. 23–31). New York: Routledge.
- Healey, M., Birnie, J., Donough, A., Gravestock, P., Hall, T., Harrison, M. E., et al. (2004). *The experience of learning at university by disabled students in geography, earth and environmental sciences and related disciplines*. Gloucestershire: Geography Discipline Network. Retrieved from www.glos.ac.uk/gdn/icp/survey.htm
- Healey, M., Jenkins, A., & Leach, J. (2006). *Issues in developing an inclusive curriculum: Examples from geography, earth and environmental sciences* (M. Hills & M. Healey, Eds.). Gloucestershire: Geography Discipline Network.
- Maidin, A. J. (2012). *Legal framework regulating for improving accessibility to built environment for disabled persons in Malaysia* (pp. 1–14). Retrieved from <http://ssrn.com/abstract=1992205> or <http://dx.doi.org/10.2139/ssrn.1992205>
- Ministry of Higher Education. (2011). *Pelajar Kurang Upaya: Bantuan*. Putrajaya: Persediaan dan Cabaran Masa Depan.
- Mitchell, D. (2008). *What really works in special education and inclusive education: Using evidence-based teaching strategies* (1st ed.). New York: Routledge.
- Mohd Ali, M., Mustapha, R., & Mohd Jelas, Z. (2006). An empirical study on teachers' perceptions towards inclusive education in Malaysia. *International Journal of Special Education*, 21(3), 36–44.
- Mohd Sahar, F. H. (2013, December). Kemudahan, Persekitaran Kurang Mesra OKU. *Berita Harian*, p. 2. Kuala Lumpur.
- Newland, B., Boyd, V., & Pavey, J. (2006). Enhancing disabled Students' learning through virtual learning. In M. Adams & S. Brown (Eds.), *Towards inclusive learning in higher education: Developing curricula for disabled* (1st ed., pp. 143–153). New York: Routledge.
- Ommerborn, R., & Suemer, R. (2001). *Using computers in distance study: Results of a survey amongst disabled distance students*. Hagen. Retrieved from <http://www.fernuni-hagen.de/ZIFF/ommsch4.doc>
- Pearson, E., & Kopyy, T. (2006). Supporting staff in developing inclusive online learning. In M. Adams & S. Brown (Eds.), *Towards inclusive learning in higher education: Developing curricula for disabled* (pp. 56–66). New York: Routledge.
- Pliner, S. M., & Johnson, J. R. (2004). Historical, theoretical, and foundational principles of universal instructional design in higher education. *Equity & Excellence in Education*, 37(2), 105–113. doi:10.1080/10665680490453913.
- Salleh, N. M., & Hijrah Mahani, D. K. (2010). Sistem Sokongan untuk Pelajar Bermasalah Penglihatan di Institusi Pengajian Tinggi. In Z. Mahamod, S. Bari, R. A. Majid, & H. Yamat (Eds.), *Proceedings of the regional conference on inclusion and special educational needs* (pp. 158–163). Bangi: Faculty of Education UKM.
- Ta, T. L. (2011, June). Poor facilities denying disabled the right to further rducation. *Sunday Star*, p. 16. Kuala Lumpur.
- Toran, H., Hanafi, M., Mokhtar, M., & Sujak, N. (2009). Sokongan dan Halangan yang dihadapi Pelajar-Pelajar Kurang Upaya di Sebuah Institusi Pengajian Tinggi di Malaysia. *Asean Journal of Teaching and Learning in Higher Education*, 1(2), 18–29. Retrieved from <http://journalarticle.ukm.my/1486/>
- UNDO, UNESCO, UNICEF, & WORLD BANK. (1990). *World declaration on education for all*. France: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0009/000975/097552e.pdf>
- UNESCAP. (2011). *Biwako Millenium framework for action: Towards an inclusive, barrier-free and rights-based society for persons with disabilities in Asia and the Pacific*. Retrieved from <http://www.unescap.org/esid/psis/disability/index.asp>
- UNESCO. (1994). *The Salamanca statement and framework for action on special need education*. France: UNESCO. Retrieved from http://www.unesco.org/education/pdf/SALAMA_E.PDF

UNESCO. (2000). *The Dakar framework for action*. Dakar, Senegal. Retrieved from <http://unesdoc.unesco.org/images/0012/001211/121147e.pdf>

United Nations. (2006). *Convention on the rights of persons with disabilities and optional protocol*. United Nations. Retrieved from www.un.org/disabilities/documents/convention/convopt-prot-e.pdf

Chapter 34

A Multi-domain Framework for Modelling Educational Games: Towards the Development of Effective Educational Games

Mifrah Ahmad, Lukman Ab Rahim, Noreen Izza Arshad, and Mazlina Mehat

Abstract A recent study conducted by the authors indicates the lack of methods and techniques to create a model for educational games, and using these models for software engineering activities such as validation. The complex nature of an educational game covers various knowledge domains such as learning theories, subject being taught, rules and regulations in activities, and gaming environment. This warrants for modelling to be part of the educational game development to enhance and ensure effectiveness. In relation to that, this paper proposes a multi-domain framework consisting of four major domains, namely, game environment, game play, learning theories and subject matter. Each domain is equipped with respective game elements based on their definition. Consequently, the implicit relationships between these elements and domains are presented with the aim of highlighting how these elements relates to each other to gain effectiveness. The result presented in this paper is the framework and implicit relationship that is created by systematic literature review.

Keywords Educational games • Development • Domains • Framework • Relationships

34.1 Introduction

Game literacy finds its genesis inside the conventional perception of literacy. Several researchers and theorists have been exploring this area of learning in recent years, among them are Prensky (2003) and Shute and Ke (2012). As video games occupy a prominent position at present, it is impractical to ignore the significance of game

M. Ahmad • L.A. Rahim (✉) • N.I. Arshad • M. Mehat
Computer and Information Sciences Department, Universiti Teknologi PETRONAS, Bandar Seri Iskandar, 32610 Tronoh, Perak, Malaysia
e-mail: mifrah09@gmail.com; lukmanrahim@petronas.com.my; noreenizza@petronas.com.my; mazlinamehat@petronas.com.my

literacy in “isolation” deciphering what makes a game an effective game while including cultural context. When game literacy involves game based learning, the understanding of games and their context, applying games in the perspective of learning is least appealing in the game itself, and more in the game as facilitator of learning. Games, themselves are known as essential learning machinery (Gee 2005). Additionally, players immerse into the game to master the learning concepts (McClarty et al. 2012). Thus, game based learning is an act of appropriate game mechanics, scenario recreation, and problem oriented learning processes to ensure learning objective is accomplished (Poulsen 2011). To develop an educational game (EG), it should include domains, pedagogical foundation, learning theories, game design components, and other requirements such as the target users, developer expert, subject-matter (teacher) etc.

A large number of literatures have described varieties of elements to be included in an educational game and advocate the importance of learning theories as one of the factors to consider when designing the game. Squire and Jenkins (2003) highlighted that a large number of scholars have confidence on computer games to become a learning tool that will inspire the students and enhance their focus on learning in subjects such as chemistry (Romli et al. 2003), physics (Bakar et al. 2002), health education (Barker et al. 2013; Mellecker et al. 2013) and mathematics (Ke 2013), and initiate a pioneering educational paradigm (Tan et al. 2007). Furthermore, GBL allows a rich learning context to assist learners to build a higher-level of knowledge through imprecise and confronting opportunities (Van Eck 2006). In addition, there has been a research which declared that games are capable of tendering 16 learning principles (Gee 2005). Computer games¹ as a favorite online activity for teenagers includes role playing games, real time strategy games, shooting and fighting games, adventure games, action games, puzzle games and chess games (Han and Zhang 2008)). Gaming trend has also changed from personal games (i.e. games played individually) to Massively Multi-player Online games (MMOG),² e.g. Lineage II and Everquest, where players play in a group over the internet (Learning 2005, January).

In United States, the video game industry approaches yearly revenues of 15 billion, with the game playing population falls between the ages of 10–34 years old, the majority are between 14 and 19 years old (Annetta 2008). A preliminary study conducted in 16 local secondary schools involving 341 students found that majority of them (92.1 %) have experienced playing computer or video games (Annetta 2008). In the context of Malaysia, a study by Rubijesmin (2007) investigated the experience of students from five schools in Malaysia and he found that 92 % of the respondents have experienced playing computer game. The study shows most of the students in Malaysia are no stranger to computer gaming.

¹Educational games have related terms: computer games, video games, game-based learning, instructional game.

²Online games have related terms: Massively multiplayer online role play games (MMORPGs), Massively multiplayer online games (MMOGs).

To ensure the education and delivery of information from the game is provided to the learners in the certified style. In a recent study (Ahmad et al. 2014) gaps have been highlighted in the development of educational games from software engineering perspective, which include the implicit or missing discussion on the relationships between elements of an EG and how these elements work together to make the game more effective. A game developer has to be clear on the relationship that exists between learning theories and game environment to build an EG that assembles its goals (Tan et al. 2007).

The main contribution of this paper is to propose a multi-domain framework for designing EG. This framework not only presents the elements of an educational game (the other literatures presents only the elements) but also the relationships between these elements. Using this framework, educational game developers will have clearer understanding of the relationships between elements of an educational game and how to design their games to become effective learning tools. Note that due to the limited number of pages, the authors are only able to present a few relationships.³ These relationships are created based on a systematic review of the games based learning, educational design and learning theories literatures cited from the year 2000 until 2013. In addition, literature discussing the importance of learning theories, game designing components, pedagogical foundations, game environment, game play, and subject experts are also explained. The remainder of this paper will discuss about existing frameworks proposed by other researchers (Sect. 34.3) and the proposed multi-domain framework (Sect. 34.4). Section 34.5 concludes the paper.

34.2 Literature Review

This section discusses the frameworks and models proposed for game developers or use the pedagogical foundations and learning theories. Although a systematic literature review by authors on twelve (12) frameworks and models have been discussed in the journal in press, this section discusses the most recent work to relate with their similarity and obtain conclusion. Annetta (2010) proposed the “I” framework for “people” who are interested to design educational games themselves. The author combines six elements as vital and fundamental for games i.e. identity, immersion, interactivity, increasing complexity, informed teaching and instructional. Annetta also covered many components such as feedback, cognitive learning theory, social activity, flow of learning state and cognitive. In addition, it can be used to assess performance-based learning to a new standardized testing. However, it has no relationship discussed in the framework where it can assist developers while developing games. Another model was introduced by Osman and Bakar (2012) based on five factors: pedagogical factor (teaching strategy), game-play design factor (rules integrated in the game), teacher factor, student factor, and other factors such as

³For the full list of relationships, please contact the authors.

availability of technology etc. Although the model has the ability to show learner’s motivation and engagement, but it does not use any learning theories or pedagogical foundation in the development of model. This model also highlights the importance of involving educators, researchers and game developers (Osman and Bakar 2012). However, the model does not provide any relationships clearly.

Game-object model (GOM) was proposed to show theoretical basis for the design of educational games (Amory 2007). The model creates interconnection between narrative, conversations, challenges, and uses eight educational theories. The relevancy, exploration, emotions and engagement should take place in the environment of educational but facing complex challenges is difficult to achieve. However, it is also mentioned that the model can be easily misconceived, which indeed, is a serious matter while developing an educational games. In contrast, the experiential model by Kiili (2005a) was designed to combine experiential learning and game play to facilitate learners with a flow experience. In addition, the model provides cognitive and constructive learning practices to assist learners in enhancement of their behaviour and attitude. To conclude, Kiili (2005a) does not involve relationship aspects of the game components as it only focuses on learner’s experience and the knowledge gained.

34.3 Methodology

Systematic literature review (SLR) is the method used in reviewing the literature and selecting the most pertinent literature with the objective of proposing a new framework for educational game design. There are five (5) steps proposed by Khan et al. (2003) and adopted in proposing the multi-domain framework are briefly shown in Fig. 34.1. A broad search of the literature is performed from internet resources such as Google Scholar, IEEE Xplore, ACM Digital Library and Springer Link using keywords such as ‘educational games’, ‘framework’, ‘design framework’ and ‘game design’. The literatures collected from the broad search are narrowed further to literatures that discuss about elements of EG. Further literature search is conducted for the authors to have better understanding of the elements.

The gap in the literature is that the relationships between educational game elements are not explicitly discussed when designing EG. From the SLR, the authors

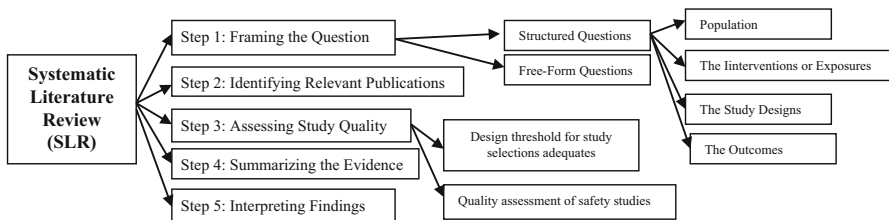


Fig 34.1 Five major steps to provide an effective systematic literature review

are expecting to identify the elements of the EG and their relationships. The proposed framework will contain the elements and relationships. The relationships is more challenging to identify as they are not explicitly mentioned. The authors used the NVIVO software to code the literatures that contain the EG elements. Using the coding technique, sentences containing the elements can be highlighted. These sentences are analysed to discern sentences that explains the relationships between elements. The authors also categorize the elements into four domains: game play, game environment, subject-matter and learning theories.

34.4 Proposed Framework: A Result from Synthesising the Literature

The educational game design framework proposed here is developed based on an extensive review of the literature. From the review, there are four major domains that should be included as part of the development process of educational games, and should be included in the framework. As mentioned before these four major domains include: (1) game play, (2) game environment, (3) subject-matter and (4) learning theories. Based on the literature, these domains are explained in detail with reference to the components selected in each domain and their brief explanation in the following sub-sections. Figure 34.2 shows the multi-domain framework. It is important to note that not all components should be part of all games. Only necessary components should be part of a specific game depending on the requirement of the developers.

34.4.1 Learning Theories

Learning theories is defined as the concepts that is described how the information is absorbed, processed and retained during learning (Wu et al. 2012). Although there is a vast number of learning theories exist in the literature, however, Wu et al., highlighted that not all theories are utilized in the development process of EG. Four major learning theories are: behaviourism, cognitivism, humanism and constructivism as further described in Table 34.1. These learning theories have 16 learning principles which can also be used in the game development. In addition, other theories are well discussed in the previous literature and they are used in the framework such as flow theory (Csikszentmihalyi 2000), experiential learning, cognitive load theory, extraneous cognitive learning (Kiili 2005b), instructional theory (Hirumi and Stapleton 2009), engagement theory (Moser 2002), achievement learning theory (Weiner 1974) and guided learning (Squire 2008).

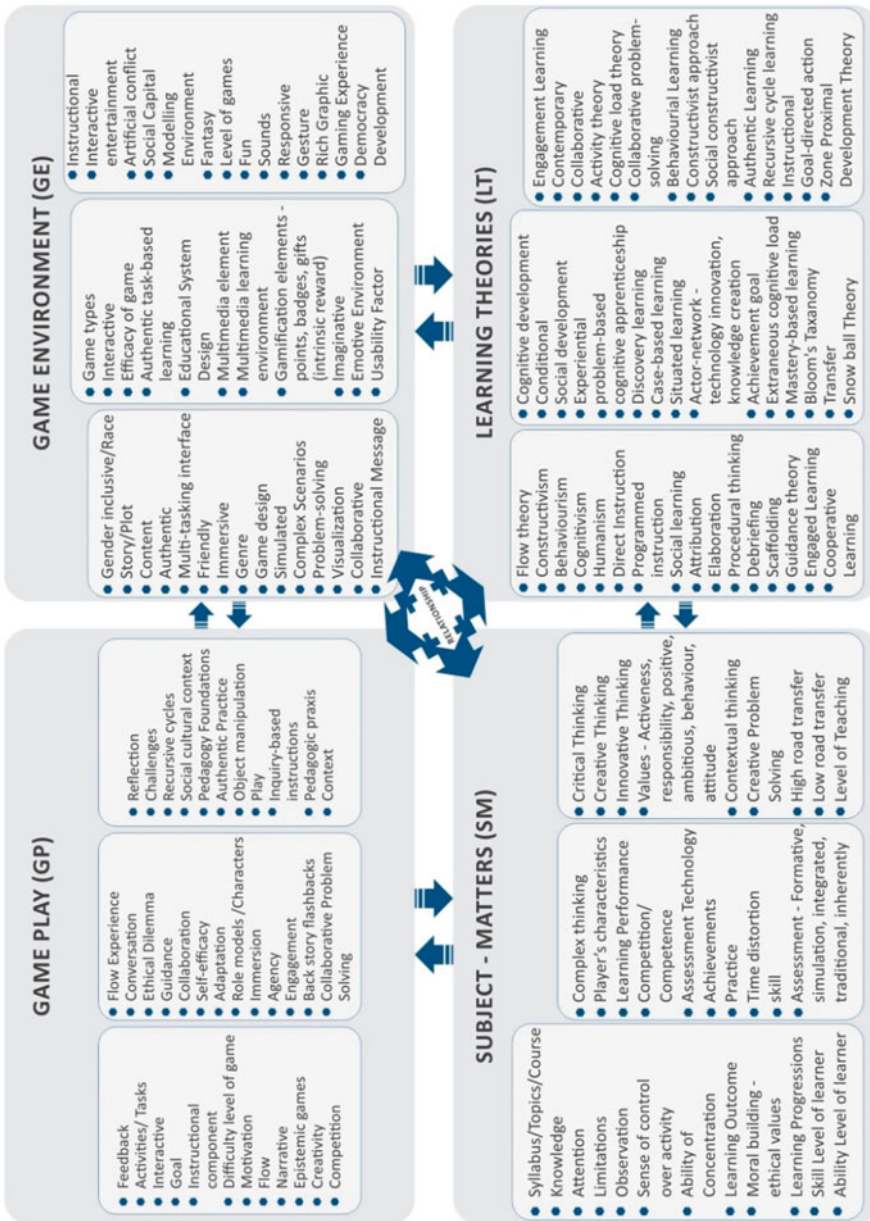


Fig 34.2 Proposed multi-domain framework

Table 34.1 Major learning theories and their principles

Theories	Description	Principles
Constructivism	Deals with human constructing their knowledge through experience and learning in active process.	Social development, Problem based learning, Cognitive apprenticeship, Discovery, Case based learning, Situated learning, Actor network
Behaviourism	Deals with learning through a drastic alteration in behaviour of student or the environment shape and the principle of reinforcement.	Direct instruction, Programmed instruction, Social learning
Cognitivism	Deals with how the memory and preceding knowledge is an important part of learning.	Attribution, Elaboration, Cognitive development, Conditional, Memory impact, Critical thinking
Humanism	Deals with factors such as self-determination, the value and potential of the user.	Experiential

34.4.2 *Game Play*

From the synthesis of the literature, it was found that game play is another important domain that all game developers have to consider when developing educational games. This is due to the fact that game play provides the rules and regulations that should be part of the games. This include component such as goals, motivations, context, guidance and ethical game play. Other components that could be part of educational games are presented in Table 34.2. Components such as activities/tasks, competition, difficult level of task and flashbacks messages are also in game play domain.

34.4.3 *Game Environment*

Game environment defined as a part of the game that allows the learners to discover new rules and ideas rather than memorizing. Furthermore, based on the literature, game environment is another domain that is crucial and should be part of the development of educational games. This is because it involves every other component and combines them together to provide an ambiance that will give the learner a motivation to continue with task to achieve goals. For example, if the environment is instructional, it will be able to provide learner with instructions to complete complex level or be productive to follow instructions throughout the game level. Table 34.3 describes the components under game environment.

Table 34.2 Game play components and their description

Component	Description	Component	Description
Feedback Interactive and reflection	Provided by players about game activities, goal strategies and their understanding after completing certain goal.	Exploring Independently and goal	Allows the players to explore, make their own hypothesis and conduct experiments to solve the problem.
Agency and pedagogic praxis. Inquiry based instructions	The student’s ability to interact with the material. One of the exploratory models of direct instruction principle	Flow experience	The components discussed about what the learners should have in their characteristics before, while and after the flow of learning occurs.
Narrative	Combining different types of task into a coherent unit to sustain student’s engagement.	Motivation and recursive cycle of learning	To link game play with experiential learning to facilitate the flow experience; as a cyclic process through direct experience in the game world.
Pedagogy foundation, guidance and engagement	Described as entertaining, educational, engaging elements of the game.	Instructional game environment	Three events stated describe levels of moving through an environment where the player engages, and for exploring content, for elaboration on their result.
Ethical Dilemma. Immersion Conversation. Adaptation. Creativity. Collaboration	Solving the right of character to achieve goals. Specified under pedagogy dimension for players to adapt to the scenario provided in the game.	Context and challenges	Attempt to identify with procedure of technological modernization and “scientific knowledge creation”.
Authentic practice	Students are combined into authentic practices through activity and social interaction.	Epistemic games	Advises on games to be suggested that such games should be based on communities of practice, reflective practices.
Self-efficacy	Self-efficacy is when a person’s belief to have ability that helps them to perform a specific task.	Object manipulation. Role models, Characters.. Collaborative problem solving.	Occurs when the players completed a goal, and another player has completed the same task. Hence, conflict integrated to include appropriate role models.

Table 34.3 Game environment components and their description

Component	Description	Component	Description
Authentic Environment	Game environment reflecting the real world with complex tasks.	Multimedia learning environment (gesture, sound, fun, fantasy, multi-task interface)	The graphic design of the educational game is a factor of attracting the players to indulge in the game. Players/ students' prefer exploratory task where the information is in multiple form.
Friendly	A friendly environment can combine content and skills to use all four factors of game.	Immersive environment	The components connect and combine as a whole to maintain a link between the player and the game.
Simulated/interactive learning environment	These can be distraction or a fundamental part of knowledge and intellectual expansion.	Complex scenario	A game environment exhibiting complex real world scenario.
Gamification elements	Achieved by player when a goal is completed. This also helps to assess the assessment, knowledge skills or the ability at each point in the game.	Collaborative environment	Playing game is referred to as solving challenges in an emotive environment.
Problem solving, gaming experience and game levels	A game environment allowing players to engage in problem solving.	Educational system design	Interactive is one of the fun elements of the game to keep the interaction between the player and the game.
Gender/race inclusive contents and plots	Gender differentiation should be designed in the game to keep track of the actors/character in the game. The story/ subject/topic of the game embedded in the game for the learner/ player to understand at the completion of the activity.	Social capital environment. Usability factor	An environment with supporting learning and shared understanding. Usability is the speediness and easiness of use.
Instructional environment	A game shall include skills, knowledge and values for learner to gain experience of a different profession perform and solve problems.	Game types. Game design. Genre modelling environment	Such as action-based, complex, interactive events, non-interactive events, effective, motivating instructional Technique of delivery.

Table 34.4 Subject-matter components and their description

Component	Description	Component	Description
Skill. Learner's skill level	The level of player's skill and applying them in an activity of a game. The ability to solve and handle challenge to balance them easily.	Moral building. Complex thinking	The values or the outcome that the learners learn throughout the game.
Assessment technology	Learner's performance can be assessed through assessments to find their abilities or knowledge they have gained.	Knowledge. Syllabus	This contains both the pre-knowledge and post knowledge of the learner before and after playing game. The course content in the educational game plot.
Learning outcome	The objective set by the game itself to achieve at the end of a topic or a module of the game.	Attention, observation,	Learner's thinking skills.
Learning performance, competition practice	Pathway students take to learn a set of knowledge i.e., the order in which they develop their skills.	Assessment.	It is in a form of puzzle or quest, to test the skills and knowledge gained.

34.4.4 *Subject-Matter*

The value of subject-matter is stressed in many literatures when the development of game is concerned. The subject-matter is described in many different contexts of the educational games. Some literature makes subject-matter as the course/syllabus being used in the content of game, whereas, some use the term as learner or educator or teacher. Table 34.4 describes what can be referred to as a subject-matter.

34.4.5 *Relationships*

The relationships found in Amory (2007), Hirumi and Stapleton (2009), Kiili (2005b) and McClarty et al. (2012) are in theoretical form, henceforth be known as theoretical relationships. The authors have to analyse the theoretical relationships and match them with the components in the framework. The paragraphed relationships are then re-written as relationship statements and highlighting the components (**bold**) in the framework. Table 34.5 presents some of the relationship statements.

Table 34.5 Relationships

	Relationship statements
1	Game play, game environment, subject-matter and learning theories are important in educational games.
2	Game play also evolves visualization of objectives and competition among players .
3	Game play has the concept of formation of goals and creativity by learners occurs.
4	Narrative story in games should match the challenges with learner's skill level to maximize engagement .
5	Learners feel intrinsically motivated when they achieve a goal and the game rewards them for completing the challenge .
6	Narrative context is interpretive and games are formal. Narrative elements in games can provide structural sequence of learning in educational games .
7	When the learner encounters flow , they improve learning , change in their attitude appears and exploratory behaviour exists.
8	To meet the goal of a task in EG , cross-functional teams and collaboration between players is necessary.
9	A story in EG should be educative, simple, immersive and engaging to the player .
10	Gaming experience elements provide continued practice and consequences that are associated with failure of task . Failure provides learning experience .
11	Entertaining game designers fail to include pedagogical principles , hence, the learners lack their skills and knowledge . However, they are entertained.
12	Educational game should adapt player's learning process to enhance learning experience .
13	Students prefer rich graphics, multi-tasking interface and competing environment to improve self-determination .
14	A game that has authentic setting provides suitable knowledge and representation of complex idea to learners .
15	Instructional games have levels of assessing the skills and knowledge of learners , hence, provides details of learner's progress through monitoring skills .
16	Learning environment is more productive if it is multi-user .
17	Learners prefer rich graphics, animated designs , and interfaces showing multi-type of information.
18	Rich graphic can also be a distraction to learners to rather focus on.
19	Games and stories are not the same. Games provide interaction and stories provide narrative context of games.
20	The relationship between reader/story is different to that between player/game .
21	Well-designed games are able to expose learners with complex tasks and professional diagnostic feedback to provide narrative content efficiently.
22	Complex games are able to provide new strategies for learners to solve ethical dilemma .
23	Digital games are able to teach the 'future' skills for future jobs such as collaboration, problem-solving, and communication .
24	Authentic task-based collaborative learning environments involve complex activities across numerous domains .
25	Authentic task-based collaborative learning environments allow reflection on the results of learner's assessment .

(continued)

Table 34.5 (continued)

	Relationship statements
26	Authentic task-based collaborative learning environments have the diversity in results of integrated assessments .
27	Evaluating the efficacy of games can be considered if the length of game play, content, structure, and mechanic of games .
28	A learning environment should be discovery of new rules and ideas, not memorizing .
29	Well-designed games are able to provide a diagnostic feedback and integrated learning experience in the actions that the learners take.
30	Problem solving in education game is also called discovery learning .
31	Authentic task-based collaborative learning provides scenario based on the real world scenario to produce integrated assessment results.
32	Behavioural approach revolves around story (key facts), concepts and game play .
33	To enhance learning experience for learners, students should adapt to the feedback provided throughout the games.
34	Learner need to face failure in order to master the experience of learning more efficiently.
35	Engaged learning has three elements, clear goals & tasks, reinforcing feedback , and increasing challenges .
36	21st century skills (collaboration, innovation and production) provide actual learning through educational game .
37	Assessments in educational game provide a mean for quantify knowledge and abilities to create more accurate models of student's knowledge and behaviour .
38	To engage students with the achievements , they should be given curriculum choices .
39	21st century skills include collaboration, problem-solving, and procedural thinking .
40	A good formative assessment is reinforced by immediate feedback , hence, enhances motivation .
41	Players think scientifically and consider relationships instead of isolated events when they play immersive games .
42	Learners feel rewarded when they achieve goals and outcomes in an activity.
43	Game developers must determine when the skills of learners should be assessed while they are playing educational games .
44	“Play” is an important part of learner's imaginative development .
45	Assessment process allows evaluation of player's action and provides feedback .
46	Assessments process has learning theories such as behaviourism, constructivism and cognitivism .
47	Action-based games have drill and practice that can affect the behaviour of the learner.
48	Flow components of the game include clear goals, balanced ability, and level of learners & sense of control .
49	Flow experience has control over activity, exploratory behaviour of learners and positive effect on learner's learning .
50	Flow provides control over actions and a stronger sense of self in flow experience .
51	Before flow occurs, focused attention and immediate feedback needs to be provided to learners.

(continued)

Table 34.5 (continued)

	Relationship statements
52	Non-interactive elements are implemented as animation .
53	Games should have features such as difficulty levels and creation of definition and models for many of the attributes such as motivation and engagement .
54	Challenges superior than player's skill level will cause the player to feel anxiety .
55	Game play is important but components such as engaging storyline , appropriate graphics and sounds , and game balance need to be considered.
56	Game play and narrative can provide cognitive resources and perception of patterns to narrative context .
57	Combining game play and narrative provides immersion and engagement to the learner throughout their gaming experience .
58	In action-based games nature, the learners tend to try actions with no reflection on outcomes unless they improve their scores.
59	Players keep experimenting with actions of games just to improve scores , not learning.
60	Gamification elements such as leader board, points awarded after each activity and badges, tend to increase engagement and motivation .
61	Educational system design may provide motivational learning , content and interactive components , to combine itself with fun elements of the game to provide better learning.
62	Games should be able to provide authentic environment and assessments .
63	Effective Games provide sound learning principles , personalized learning opportunities , and robust feedback .
64	Games should also have features such as gaming genre and delivery environment .
65	Gaming experience has elements such as limited consequences , agency , and choices for learners .
66	Learners prefer fast, active and exploratory learning environment in educational games.
67	Games should support complex scenarios such as relevancy , explorative and engaging .
68	Game should support complex scenarios such as relevancy , and emotive towards learners.
69	Instructional games should have epistemic frames , which includes practice, identity, interest, understanding , and epistemology .
70	Instructional games should be based on reflective practices and pedagogical praxis (performance) to engage learners.
71	Interactive entertainment of games should have story (why) , game (how) , and play (what) .
72	Educational games should provide guidance and collaboration to meet the challenges .
73	Games should provide exploring phenomena , testing hypothesis and constructing objects .
74	Flow of learning includes ability of concentration and deep involvement of learners through the game activities.
75	Before flow of learning occurs, perception of challenges to match one's skills , speed of learner to solve an activity and ease of use need to be established.
76	Experiential learning does not require teacher as it is completely meaning-making process in individual experience .

(continued)

Table 34.5 (continued)

	Relationship statements
77	Mastery-based learning requires students to spend adequate time to learn each skill .
78	Debriefing provides connection between learning in game and applying those skills to other contexts.
79	Behavioural learning approach has story, concepts and game play to encourage the learners play dependently.
80	Experiential learning theory and flow theory combined with game design can provide immediate feedback to match the learner's skill level .
81	Experiential learning theory and flow theory combined with game design can provide clear goals and challenges to match the learner's skill level .
82	Goal-directed action is a continuous learning and an appropriate feedback is provided.
83	Cognitive development involves sensory motor and formal operation of learning.
84	Cognitive apprenticeship provides social interaction through authentic practices .
85	Knowledge and experience of learners must match to learner's knowledge level to achieve higher experience flow .
86	Educational practice and learning can provide fun and instructional practice to the learner.
87	Educational practice should be able to provide motivational learning for learners .
88	Reflective observations of feedback provide construction of plan to establish complex thinking .
89	Reflective observation of feedback allows discovery of new solutions when learners achieve goals .
90	Assessment technology has collaborative environment to engage and motive learning while assessing their skills .
91	Games should indulge learners with assessments to quantify knowledge and abilities .
92	To improve the enforcement of learning objectives by learners, learning and entertainment element must be connected.
93	Learning process combines explicit knowledge, conversations , and reflection of results for learners to construct knowledge .
94	Player's ideal solution is to overcome the challenges with less repetitions of solving .
95	Players meet the challenges through guidance and collaboration throughout the process of solving a task .

34.5 Conclusion

This paper presents a multi-domain framework to visualize the 154 components in four (4) major domains in educational games with their relationships. The components of the domains are chosen from various literature with respect to game design, effective game elements, learning theories, subject-matter aspect, and pedagogical factors. There have been many frameworks and models developed by other researchers, however, the highlight the proposed framework is that it demonstrates implicit relationships amongst the components and domains of multi-domain framework, hence, provides a better overview for game developers to cooperate and identify the needs to provide an effective educational game.

The authors will further validate the framework by conducting expert interviews to verify the implicit relationships and modify the relationships according to expert's point of view. Hence, this will provide explicit relationships for game developers. In addition, the case study on educational games will be conducted where the subject-matter related to the educational game course/content will be chosen. This will further highlight the practicality of the framework.

References

- Ahmad, M., Rahim, L. A., & Arshad, N. I. (2014, June). A review of educational games design frameworks: An analysis from software engineering. In *2014 International Conference on Computer and Information Sciences (ICCOINS)* (pp. 1–6). IEEE.
- Amory, A. (2007). Game object model version II: A theoretical framework for educational game development. *Educational Technology Research and Development*, *55*(1), 51–77.
- Annetta, L. (2008). Cheng, Meng-Tzu. Why educational video games? In L. A. Annetta (Ed.), *Serious educational games: from theory to practice*. Rotterdam: Sense Publishers.
- Annetta, L. A. (2010). The “I’s” have it: A framework for serious educational game design. *Review of General Psychology*, *14*(2), 105.
- Abang Abu Bakar, N. A., Hashim, S., & Shiratuddin, M. F. (2002). Virtual reality: a review of its implementation in the virtual physics lab. *Journal of Information and Communication Technology*, *1*(1).
- Barker, D., Quennerstedt, M., & Annerstedt, C. (2013). Inter-student interactions and student learning in health and physical education: A post-Vygotskian analysis. *Physical Education and Sport Pedagogy*, (ahead-of-print), 1–18.
- Csikszentmihalyi, M. (2000). Finding flow. The psychology of engagement with everyday life. *Journal of Happiness Studies*, *1*(1), 121–123.
- Gee, J. P. (2005). Good video games and good learning. *Phi Kappa Phi Forum*, *85*, 33.
- Han, Z., & Zhang, Z. (2008). Integration of game elements with role play in collaborative learning – A case study of Quasi-GBL in Chinese higher education. In *Technologies for E-learning and digital Entertainment* (pp. 427–435). Berlin/Heidelberg: Springer.
- Hirumi, A., & Stapleton, C. (2009). Applying pedagogy during game development to enhance game-based learning. In *Games: Purpose and potential in education* (pp. 127–162). New York: Springer.
- Learning, G. B. (2005). *Massively multiplayer online games and their implications for game-based learning* (pp. 1–13). Markus Hofer, IND02, Seminar Work: Game Based Learning.
- Ke, F. (2013). Computer-game-based tutoring of mathematics. *Computers & Education*, *60*(1), 448–457.
- Khan, K. S., Kunz, R., Kleijnen, J., & Antes, G. (2003). Five steps to conducting a systematic review. *Journal of the Royal Society of Medicine*, *96*(3), 118–121.
- Kiili, K. (2005a). Content creation challenges and flow experience in educational games: The IT-emperor case. *The Internet and Higher Education*, *8*(3), 183–198.
- Kiili, K. (2005b). Digital game-based learning: Towards an experiential gaming model. *The Internet and Higher Education*, *8*(1), 13–24.
- McClarty, K. L., Orr, A., Frey, P. M., Dolan, R. P., Vassileva, V., & McVay, A. (2012). A literature review of gaming in education. A Research Report in *Gaming in Education*, 1–36.
- Mellecker, R. R., Witherspoon, L., & Watterson, T. (2013). Active learning: Educational experiences enhanced through technology-driven active game play. *The Journal of Educational Research*, *106*(5), 352–359.
- Moser, R. B. (2002). A methodology for the design of educational computer adventure games. Unpublished doctoral dissertation, New South Wales, Australia.

- Osman, K., & Bakar, N. A. (2012). Educational computer games for Malaysian classrooms: Issues and challenges. *Asian Social Science*, 8(11), 75.
- Poulsen, M. (2011). Learning by producing. *THE GAMEiTHANDBOOK*, p. 87.
- Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment*, 1(1, October), 21.
- Romli, R., Shiratuddin, M. F., & Hashim, S. (2003). The virtual chemistry lab (VC-L): Virtual reality as a learning tool for Malaysia's secondary school. *The Journal of Information and Communication Technology*, 2(1), 81–92.
- Rubijesmin, A. L. (2007). *Understanding Malaysian students as gamers: Experience*. Paper presented at Conference on Digital Interactive Media in Entertainment and Arts, Perth, Australia.
- Shute, V., & Ke, F. (2012). Games, learning, and assessment. In D. Ifenthaler, D. Eseryel, & X. Ge (Eds.), *Assessment in game-based learning* (pp. 43–58). New York: Springer.
- Squire, K. (2008). Open-ended video games: A model for developing learning for the interactive age. The ecology of games: Connecting youth, games, and learning. In K. Salen, The John D., & C. T. MacArthur (Eds.), *Foundation series on digital media and learning* (pp. 167–198). Cambridge, MA: The MIT Press.
- Squire, K., & Jenkins, H. (2003). Harnessing the power of games in education. *Insight*, 3(1), 5–33.
- Tan, P.-H., Ling, S.-W., & Ting, C.-Y. (2007). Adaptive digital game-based learning framework. In *Proceedings of the 2nd international conference on digital interactive media in entertainment and arts* (pp. 142–146). New York: ACM.
- Van Eck, R. (2006). Digital game-based learning: It's not just the digital natives who are restless. *EDUCAUSE Review*, 41(2), 16.
- Weiner, B. (1974). *Achievement motivation and attribution theory*. Morristown: General Learning Press.
- Wu, W.-H., Hsiao, H.-C., Wu, P.-L., Lin, C.-H., & Huang, S.-H. (2012). Investigating the learning-theory foundations of game-based learning: A meta-analysis. *Journal of Computer Assisted Learning*, 28(3), 265–279.

Chapter 35

Usability Testing for Culturally-Enhanced Serious Game

M. Ariffin Mazeyanti, Wan Ahmad Wan Fatimah, and Sulaiman Suziah

Abstract In general, serious game usability testing aims to assess whether a serious game is usable to the intended users. Failure to design a usable serious game could influence the player's experience and give negative impact on the overall quality and success of a serious game. A serious game prototype called my-CEN had been developed and this paper aims to report on the findings discovered from the usability testing. User methods approach namely observational analysis and survey-based were applied in this research work. The instruments used in this study were validated through pilot study and total of 35 participants from Universiti Teknologi PETRONAS (UTP) involved in the usability testing. In summary, the analyses from both approaches suggest that my-CEN serious game passed the usability testing requirements thus, the serious game is usable to the intended users.

Keywords Serious game usability • Observational analysis • Survey-based approach

35.1 Introduction

The main objective of conducting serious game usability testing was to evaluate whether a serious game is usable to the intended users (Moreno-Ger and Torrente 2012). Additionally, it allows developer to identify design or implementation issues that might prevent players from successfully interact with a final product (Moreno-Ger and Torrente 2012). Failure to design a usable serious game could influence the player's experience and give negative impact on the overall quality and success of a serious game (Pinelle et al. 2008a, b). Thus, this paper aims to report on the findings which were obtained from the usability test of a culturally-enhanced serious game called my-CEN.

M.A. Mazeyanti (✉) • W.A. Wan Fatimah • S. Suziah
Computer & Information Sciences, Universiti Teknologi PETRONAS,
32610 Seri Iskandar, Tronoh, Perak, Malaysia
e-mail: Mazeyanti@petronas.com.my; Fatimhd@petronas.com.my;
suziah@petronas.com.my

This paper is segmented into several parts; Part I provides the overview of the serious games usability, Part II presents the literature review, Part III discusses the methodology and finally Part IV is the discussion.

35.2 Literature Review

Usability is defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO 9241-11, 2011). Generally, this broad definition emphasizes on having products that allow users to achieve goals and provides a base for measuring usability for different software products. However, serious games are very specific type of software that has unique requirements and characteristics, therefore this broad definition posed several challenges for researchers when evaluating serious games. For example, making errors are commonly undesirable in many systems and applications but is expected in many serious games since they are designed to challenge users. Furthermore, serious games are distinct from other type of applications (Moreno-Ger and Torrente 2012; Zin and Yue 2009) since serious games have an additional objective of knowledge discovery and learning (Moreno-Ger and Torrente 2012). This notion is supported by De Freitas and Oliver (2006) who mentioned that learning effectiveness, engagement, appropriateness of the design for a specific context and target audience are the dimensions that need to be considered when assessing a serious game.

There are a variety of approaches to assess usability. These approaches can be broadly categorized as (i) expert methods, in which experienced evaluators identify potential pitfalls and usability issues, (ii) theoretical methods, in which theoretical models of tools and user behaviors are compared to predict usability issues, and (iii) user methods, in which software prototypes are given to end users to interact (Macleod and Rengger 1993). In user methods, there exist two main approaches: observational analysis, in which a user interacts with the system while the developers observe, and survey-based methods, in which the user fills in evaluation questionnaires after interacting with the system.

35.3 Methodology

This research work used user method approach in assessing the usability of my-CEN serious game. The authors conducted both approaches in user method; which are observational analysis and survey-based. Both approaches were performed to complement each other.

35.3.1 *Observational Analysis*

The purpose of the observation analysis was to observe user experiences playing with my-CEN serious game. My-CEN serious game is customized for higher education learners in Malaysia. Hence it is important to recruit users (henceforth called participants) from the same target audience (Moreno-Ger and Torrente 2012; Nielsen 2000).

35.3.1.1 **Recruitment Procedures**

To recruit the participants, an invitation contained a brief description of the study, eligibility criteria and contact information was distributed to all potential participants in Universiti Teknologi PETRONAS (UTP) through online and hard copy. The online invitations were distributed through UTP's e-learning, Facebook and SRCUTP while hard copy invitations were distributed during class sessions.

To be eligible to participate in this observation analysis, participants must be at least 17 years old however cannot be older than 23 years old. This target group of age is selected since it represents the ideal age range for higher education learners in Malaysia. Additionally, the participants must also have experience playing any computer serious games for the past 6 months and have basic knowledge on computer security.

Five (5) undergraduate students were recruited as the participants for observation analysis study. Researchers such as O'Neil, Baker and Fisher (2005) and Chen (2005) suggest that sample size between 3 and 5 is sufficient to evaluate the functionality of an application. Table 35.1 shows the description of each tester.

35.3.1.2 **Session Evaluators**

Additionally, two (2) evaluators were recruited to analyze the playing session of my-CEN serious game. Nielsen (2000) suggested that having more than one evaluator will increase the reliability of the analysis, since different evaluators could identify different issues. The evaluators were postgraduate students who have experience playing my-CEN serious game as well as had experience conducting usability observation.

Table 35.1 Descriptions of participants in observational analysis

Participant	Age	Gender	Ethnicity	Program	Game experience
Participant1	18	F	Malay	BIS	1 year
Participant2	18	M	Malay	BIS	1 year
Participant3	19	M	Chinese	ICT	2 years
Participant4	19	F	Indian	ICT	2 years
Participant5	19	M	Indian	ICT	5 years

Table 35.2 Descriptions of participants in observational analysis

No	Dimension	Item	Measurement
1	System related	Time taken to complete given tasks	Minutes & second
2		Number of moves taken to complete the tasks	Moves
3		Percentage of correct moves as compared to benchmark value	Frequency & percentage
4		Total number of events occurred	Frequency & spread value
5	User related	User experience	Frequency

35.3.1.3 Design of Instrument

This research work adopted the Serious game Usability Evaluation (SeGUE) proposed by Moreno-Ger et al. (2012). There are two (2) main dimensions that being evaluated: system-related and user-related. The system-related dimension focuses on serious game design, serious game interface and implementation while user-related dimension concentrates on user's emotions spectrum. Serious game flow, functionality, content and layout are some of the event categories that fall in system-related dimension whereas emotions such as confused, annoyed, excited and learning are some event categories that fall in user-related dimension. In this paper, the term user-experience is referred as emotion expressions of the participants during the testing. Table 35.2 depicts the measurement items according to system-related and user related dimension.

35.3.1.4 Observational Analysis Session

The session was conducted by following a script in order to ensure smooth observational analysis process. A detailed script indicating tasks the participants are expected to perform was prepared prior to the session. The script was designed to address specific learning goals, all relevant serious gameplay and user interface within the serious game design. Each tester was required to complete six (6) tasks. Table 35.3 illustrates the tasks assigned to the participants. The total playing time was estimated about 30 min.

The observational analysis was conducted in Virtual Reality Lab at UTP. It was conducted in a closed-session situation where only participants and two evaluators were in the lab to test my-CEN serious game. The Campaign Analyzer (embedded in my-CEN serious game) is used to record the time and actions of the participants throughout the session. The evaluators will observe the participants and record every aspect that participants might show such as their body language, facial expressions, and comments as well as complete the provided tasks checklist. Prior to the session, participants need to undergone several steps. First, participants need to fill in their demographic details such as age, gender, ethnicity, program and serious game experience. Second, participants were allowed to explore my-CEN serious game before the session starts. Finally, participants were required to perform the tasks given to them while evaluators observe the session.

Table 35.3 Descriptions of participants in observational analysis

No	Tasks
1	Start the my-CEN malicious code campaign
2	View the computer security definition and principles
3	View the serious game objectives
4	Buy new workstation
5	View lab manual
6	Change procedural settings on beware of email attachment

35.3.2 Survey-Based Approach

To complement the observational analysis findings, a survey-based approach were conducted. The survey-based usability testing was conducted to a larger sample size by using questionnaire. The aim of this survey-based approach is similar to observational analysis; which is to assess the functionality of my-CEN serious game, to ensure the user interface is easy to learn, fluent to use and supports user interactions.

35.3.2.1 Design of Instrument

The instrument was modified based on the work of Zin and Yue (2009). Similar work has been used by other researchers in evaluating serious games such as Froschauer et al. (2010) and Fujimoto (2010). Yue and Zin (2009) proposed 23 elements in their usability model however, only six (6) elements were considered in this research. These six (6) elements were chosen due to the suitability of the elements with regards of the research context.

The questionnaire was segmented into seven (7) parts; Part 1 is the demographic information, Part 2 is playability, Part 3 is serious game mechanic, Part 4 is interface, Part 5 is feedback, Part 6 is hints and Part 7 is learning content. In Part 1, participants were required to fill up their demographic details such as age, gender, ethnicity, program and serious game experience. Meanwhile, for the remaining parts, the participants were required to rate the functionalities of My-CEN serious game based on the Likert-5 scale (1 = Very poor, 2 = Poor, 3 = Fair, 4 = Good, 5 = Excellent).

35.3.2.2 Recruitment Procedure

To recruit the participants for the survey-based approach, similar procedure as observational analysis were conducted. The invitations were distributed to UTP students through hard copy and online means. The online invitations were distributed through UTP's e-learning, Facebook and SRCUTP meanwhile fliers were distributed during class session.

To be eligible to participate in the pilot study, firstly the participants must be between 17 and 23 years old. This age group was selected as the target audience since in Malaysia, generally higher education learners age ranged from 17 to 23 years old. Secondly, participants must have prior experience with computer serious games in the past 6 months. Lastly, the participants must possess basic knowledge on computer security.

35.3.2.3 Pilot Study

Prior to the real data collection, a pilot study was conducted with 13 undergraduate students from Computer and Information Sciences Department (7 Male and 6 Female). Pilot study is useful when the researchers want to identify any potential problems that may exist in the instruments (Mazlan 2012). In additional, pilot study was conducted to assess the reliability of the questionnaire since the questionnaires was adopted from the other researchers work. The pilot study was conducted in UTP's Virtual Reality Lab.

The reliability analysis was performed by using SPSS v20. The Cronbach Alpha value is 0.853. According to Sekaran (2006) and Coakes et al. (2006), an instrument is deemed reliable when the Cronbach Alpha value is above 0.70. Thus this result indicates that the instrument is reliable and internally consistent to be distributed to a larger audience.

35.3.2.4 Procedure

Approximately 75 min were allocated for the session. 5 min were allocated to brief the participants on the objectives of the study and the serious game, 30 min were allocated for them to explore the serious game by themselves and 40 min were gives to participants to answer the serious game usability questionnaire. All participants were allowed to communicate with each other while playing my-CEN serious game.

35.4 Result and Discussion

As mentioned earlier, there were five (5) items measured in the observational analysis; completion time, number of moves to complete the tasks, percentage of correct moves, and total number of events occurred as well as user experience. The next section will discuss on the findings found from the observational analysis.

35.4.1 Findings from Observational Analysis

This section will present the findings obtained from the observational analysis namely the time taken, total number of moves, events occurred and user-experience.

35.4.1.1 Time Taken

According to Table 35.4, the mean value of time taken to complete all six tasks was about 25.61 min in length. The completion time recommended by my-CEN serious game developer was 30 min; thus being able to complete all tasks in less than 30 min shows that my-CEN serious game is considered to have sufficient level of usability. Additionally, all participants managed to complete all tasks given to them which indicate that my-CEN serious game is simple and easy to understand.

35.4.1.2 Total Number of Moves

From Table 35.4, on average, 45 moves were taken by the participants to complete all tasks assigned to them. The total moves proposed by the serious game developer were 36 steps. The result suggests that participants need 9 additional moves or approximately 25 % more moves to finish the task as compared to the number of moves suggested by the serious game developer. This value is within the usability pass criteria recommended by (Sivaji et al. (2011), hence it shows that my-CEN serious game surpasses the usability testing.

Further mode analysis was conducted on the number of moves (as illustrated in Table 35.5). The number of moves taken by the participants were categorized and labeled as low (0–2 moves), medium (3–5 moves) and high (6–8 moves). Later, the number of moves was compared with the bench mark values proposed by the serious game developer.

From Table 35.5, it shows that majority of participants able to performed not more than six additional moves when performing any of the tasks, which is indicates as ‘Low’ and ‘Medium’ in the table. These results suggest that the flow of the serious game, layout, content and functionality of my-CEN is acceptable hence the usability level of my-CEN serious game is sufficient.

Table 35.4 Mean value of completion time and number of moves

No	Item	Mean value	Bench mark value
1	Completion time (complete all tasks)	25.61 mins	30 mins
2	Number of moves to complete all tasks	45 moves	36 moves

Table 35.5 Mode analysis of number or moves

Category	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6
	%	%	%	%	%	%
Low	80	80	60	80	80	80
Medium	20	20	40	20	20	20
High	0	0	0	0	0	0

Table 35.6 Top five events encountered by participants and its spread value

Rank	Events	Type	Frequency	Spread value
1	Technical error on the screen when performing actions	Technical error	39	5
2	No sound effect upon player actions	Layout/User interface	33	5
3	Serious game characters redundancy	Technical error	28	5
4	Flickering serious game objective screen	Functionality	15	3
5	Mouse clicking accuracy	Functionality	8	2

35.4.1.3 Events Occured

Table 35.6 illustrates the frequency and spread value based on the events identified by the evaluators. The spread value refers to number of participants faced similar problem. This table shows the top five (5) events encountered by the participants during the serious game testing.

The most errors encountered by participants were the technical errors that appeared on the screen during the serious game play. This event was tagged 39 times; hence this error received the highest rank and must be corrected by the serious game developer.

The second in the rank is layout or user interface issue, this includes no sound effect provided upon their actions in the serious game. This issue happened 33 times to all participants. Thus, the serious game developer needs to rectify this problem before my-CEN serious game could be used in the effectiveness study.

Additionally, all participants also complaint about redundancy of serious game characters in the serious game environment. In some occasions, the serious game characters were doubled and caused confusion to the participants. This issue happened 28 times during the testing session, therefore this issue rank number 3.

Additionally, in Table 35.6, it also portrays the spread value of each event. Spread values refers to the number of participants encountered the events. From this table, the first top three (3) events were faced by all participants (spread value=5). Meanwhile only three participants encountered flickering screen and only two participants encountered mouse accuracy issue.

From the analysis of events, it shows that the serious game needs some modification and changes prior to the effectiveness study. Based on the analysis, the changes were minor and did not affect the overall serious gameplay design.

35.4.1.4 User Experience

Table 35.7 shows the user-related statistics recorded by evaluators during the observational analysis. Participants demonstrate higher positive reactions during the interaction with the serious game. Positive reactions outperformed the negative

Table 35.7 Statistics of user-related events

User-related events		Frequency	Total
Negative	Frustrated	23	57
	Annoyed	6	
	Confused	28	
Positive	Learning	15	107
	Reflecting	23	
	Satisfied/exciting	52	
	Pleasantly frustrated	17	

reactions. 52 tags were related to satisfied or exciting event type, while 23 tags were related to reflecting. Pleasantly frustrated was tagged 17 times as compared to learning event which happened 17 times throughout the observation session. In total, positive reactions were tagged 107 times.

From Table 35.7, it also shows that there were 28 tags on confused events and 23 tags were related to frustrate and the remaining 6 tags were annoyed events. In summary, a total of 57 events were related to negative emotions. At the end of the observation, all evaluators will consolidate the data collected from each tester. The outcome of this session will be a task list of improvement. The list will act as the basis of changes and improvement to my-CEN serious game.

Based on the analysis of user-related events, it clearly shows that positive events outperformed the negative events, which indicate majority of the participants demonstrate positive reactions when they interact with my-CEN serious game. These positive reactions indicate that participants were satisfied and excited about the serious game. Therefore, it could be inferred that my-CEN serious game meets the usability criteria.

35.4.2 Findings from Survey-Based Approach

Figure 35.1 depicts the mean scores for all usability elements of my-CEN serious game. The mean score for playability is high which is 4.07 (out of 5). High playability mean score indicates that the serious game able to motivate participants to continue playing; through manifestation of good graphics, sound effect, appropriate serious game complexity and difficulty. Hence, it can be inferred that participants enjoyed and had great time playing my-CEN serious game.

The mean score for learning content element is also high which is 4.00 (out of 5). From this result, it was learnt that my-CEN serious game provides sufficient overview of malicious code attack as well as all participants perceived that they could learn computer security principles by playing this serious game.

The mean score for serious game mechanic is 3.48 (out of 5). The result indicates that generally, the serious game rules are clear and the serious game flow is fluent.

The mean score of interface is above average which is 3.40 (out of 5). The result shows that the serious game's control mechanism and serious game interface are

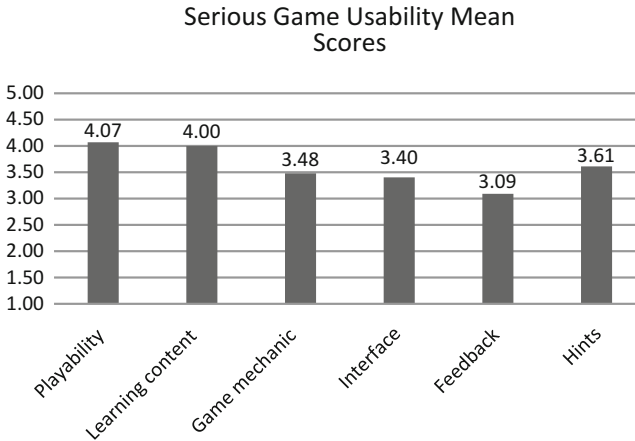


Fig. 35.1 My-CEN serious game usability mean scores

consistent. Meanwhile, the in-serious game feedback mean score was rated 3.09 while hints were rated 3.61 (out of 5 points).

In summary, it shows that the mean score for all elements were above average and ranged between 3 (neutral) and 4 (agree). The in-serious game feedbacks element was rated the lowest while serious game's playability was rated the highest by the participants. Generally, it could be inferred that my-CEN has passed the serious game usability level, however strong conclusion could not be made due to all mean scores do not have finite values. Hence, further mode analysis was performed for each element, as suggested by Sekaran (2006). The responses were analyzed by combining 'strongly disagree' and 'disagree' responses as 'disagree', and 'agree' and 'strongly agree' responses as 'agree'. Researchers such as Mazlan (2012), Ahmad Sobari et al. (2014) and Ibrahim et al. (2011) used this method when investigating student's attitude and perception towards the use of technology for learning.

Table 35.8 shows mode analysis result for all usability elements. From the table, 79.00 % of the participants agree that the serious game is simple and easy to play, while 17.00 % were neutral and only 4.00 % thought that the serious game is complex. This result shows that my-CEN serious game has sufficient visual and sound effects. In additional, the result also indicates that participants were satisfied with the realism of the serious game environment. Hence, it reflects that the level of playability of my-CEN serious game is sufficient.

Participants were also asked on the learning content presented in my-CEN serious game. 75.00 % agreed that the learning content provided in my-CEN serious game is adequate and appropriate. 16 % were neither agree nor disagree while only 9.00 % were disagreed that my-CEN serious game covers sufficient overview of malicious code attack. High percentage of agreement on the learning content element depicts that my-CEN serious game provides sufficient overview on malicious code attack.

Table 35.8 Mode analysis of my-CEN usability elements

Elements	Agree (%)	Neutral (%)	Disagree (%)
Playability	79.00	17.00	4.00
Learning content	75.00	16.00	9.00
Game mechanic	48.40	42.00	9.60
Interface	58.00	35.50	6.50
Feedback	46.20	34.40	19.40
Hints	55.90	23.70	20.40

Majority of participants agreed that the serious game has good serious game mechanic (48.40 %). Nearly 42.00 % neither agreed nor disagreed and only 9.60 % disagreed on this element. This result indicates that participants agreed the serious game interactions are smooth and the serious game rules are clear. Smooth interactions between serious game and users are vital as it is to ensure participants could control and learn from serious game, attract the participants and encourage them to advance to the next level. Hence it can be assumed that the serious game mechanic of my-CEN successfully passed the serious game usability requirement.

In addition, majority of participants agreed that the serious game's interface was good (58.00 %). Only 6.50 % thought the serious game's interface was bad while the remaining 35.50 % could not determine whether the serious game's interface was good or not. High percentage on agreement on serious game's interface element indicates that the serious game's interface was efficient, highly good looking and non-intrusive to participants. Thus, it can be concluded that the serious game successfully creates a compelling experience to participants and consequently bring positive effect on overall quality and success of a serious game.

Almost half of the participants agreed that the serious game provide sufficient in-game feedbacks (46.20 %). 34.40 % were undecided on the in-game feedbacks element and the remaining 19.40 % were disagreed. High percentage on in-game feedbacks element shows that participants were able to obtain requested information on time and guide them to apply information accurately in order to avoid any wrong understanding. This result support the result obtained from the mean value analysis hence a conclusion can be made that my-CEN serious game provides sufficient feedback to participants.

The result showed that my-CEN serious game passed the usability requirements as the mean scores of all measured serious game usability elements were higher than the mean of Likert-scale 3.00 and mode analysis result shows that majority of participants agree that my-CEN serious game had passed the usability testing for serious game.

35.5 Conclusion

As a conclusion, my-CEN serious game had passed the serious game usability criteria. The positive findings obtained from the observational analysis suggest that participants able to complete the given tasks in lesser than the recommended time as

well as able to perform all tasks within the usability range. Additionally, participants demonstrated more positive than negative reactions during the serious game playing session which suggests that the participants enjoyed their experience playing my-CEN serious game.

Additionally, the result found from the survey-based approach suggests that my-CEN serious game is easy to play and learn as well as the serious game mechanic is smooth and the game interactions is fluent. This result was supported by positive responses and high mean value on the playability, learning content, game mechanic, interface, in-game feedback and hints.

Both results obtained from the observational analysis and survey-based approach demonstrated that my-CEN serious game had passed the usability testing and meets the serious game usability requirement. Hence, further effectiveness study will be conducted to determine the effectiveness of my-CEN serious game to improve knowledge acquisition.

References

- Ahmad Sobri, H., Wan Fatimah, W. A., Shahrina, M. N., & Azizah, J. (2014). Usability Study of MobileSchool System for Secondary Schools in Malaysia. In Proceedings from i-USER 2014: The International Conference on User Science and Engineering (pp. 198–203). IEEE.
- Chen, H. (2005). *A formative evaluation of the training effectiveness of a computer game* (p. 68). Retrieved from <http://dl.acm.org/citation.cfm?id=1104417>
- Coakes, S., Steed, L., & Price, J. (2006). *SPSS: Analysis without anguish; version 16.0 for Windows*. New Delhi: Wiley.
- De Freitas, S., & Oliver, M. (2006). How can exploratory learning with games and simulations within the curriculum be most effectively evaluated? *Computers & Education*, 46(3), 249–264. doi:10.1016/j.compedu.2005.11.007.
- Froschauer, J., Seidel, I., Gartner, M., Berger, H., & Merkl, D. (2010). Design and evaluation of a Serious Game for immersive cultural training. *2010 16th international conference on virtual systems and multimedia* (pp. 253–260). doi:10.1109/VSMM.2010.5665978
- Fujimoto, R. (2010). *Designing an educational alternate reality game*. Shoyu Learning Solutions.
- Ibrahim, R., Samsudin, W., Rasimah, C. M. Y., Khalili, K., & Azizah, J. (2011). Students perceptions of educational games in higher education: An empirical study. *Issues in Information Systems*, XII(1), 120–133.
- Macleod, M., & Rengger, R. (1993). The development of DRUM: A software tool for video-assisted usability evaluation. In *Proceedings of the 5th international conference on human-computer interaction (HCI '93)* (pp. 1–13).
- Mazan, M. (2012). *Students' Perception of Motivation to Learn: Does an Avatar Motivate?*. Durham University. Retrieved from <http://theses.dur.ac.uk/3367/>
- Moreno-Ger, P., & Torrente, J. (2012). Usability testing for serious games: Making informed design decisions with user data. *Advances in Human-Computer Interaction*, 2012, 1–13. doi:10.1155/2012/369637.
- O'Neil, H., Wainess, R., & Baker, E. (2005). Classification of learning outcomes: Evidence from the computer games literature. *Curriculum Journal*, 16(4), 455–474. Retrieved from <http://www.tandfonline.com/doi/abs/10.1080/09585170500384529>
- Pinelle, D., Wong, N., & Stach, T. (2008a). Heuristic evaluation for games: Usability principles for video game design. In *Proceedings of the SIGCHI conference* (pp. 1453–1462). doi:10.1145/1357054.1357282

- Pinelle, D., Wong, N., & Stach, T. (2008b). Using genres to customize usability evaluations of video games. In *Proceedings of the 2008 conference on future play: Research, play, share* (pp. 129–136). doi:<http://doi.acm.org/10.1145/1496984.1497006>
- Sekaran, U. (2006). *Research method of business: A skill-building approach* (4th ed.). New York: Wiley.
- Sivaji, A., Downe, A., Muhammad Fahmi, M., Soo, S., & Azween, A. (2011). Importance of Incorporating fundamental usability with social & trust elements for E-commerce website. In *Proceedings of international conference on business, engineering and industrial applications* (pp. 221–226). doi:<http://doi.acm.org/10.1145/1496984.1497006>
- Yue, W. S., & Zin, N. A. M. (2009). Usability evaluation for history educational games. In *Proceedings of the 2nd international conference on interaction sciences information technology, culture and human – ICIS'09* (pp. 1019–1025). doi:[10.1145/1655925.1656110](https://doi.org/10.1145/1655925.1656110)
- Zin, N. A. M., & Yue, W. S. Y. W. S. (2009). History educational games design. In *2009 International Conference on Electrical Engineering and Informatics* (Vol. 01). doi:[10.1109/ICEEI.2009.5254775](https://doi.org/10.1109/ICEEI.2009.5254775)

Chapter 36

Organizational Innovativeness as Predictors to Organizational Performance of Public Universities in Malaysia

Norashikin Hussein, Safiah Omar, Fauziah Noordin,
and Noormala Amir Ishak

Abstract The transformation of Public Institutions of Higher Education (PIHE) in Malaysia to become competitive at the international level brings up the need to improve the organizational performance level among the academicians. This comes together with the development and implementation of organizational innovativeness in the education industry. This article firstly assessed the level of organizational performance and organizational innovativeness among the academicians in Malaysian PIHEs. Secondly, organizational innovativeness is assessed whether it may have any influence on organizational performance using correlation and multiple regression analyses. Using samples of 88 academicians taken from various public universities in Peninsular Malaysia, the level assessment found that both variables are moderate. The highest correlation was found between organizational innovativeness with development target and characteristics. The highest Beta value in multiple regressions was also found between organizational innovativeness with development target and characteristics followed by curriculum planning, and reputation. Implications and further research suggestions are discussed in this paper.

Keywords Organizational innovativeness • Organizational performance • PIHE

N. Hussein (✉) • S. Omar
Faculty of Business Management, Universiti Teknologi MARA,
400450 Shah Alam, Selangor, Malaysia
e-mail: shikin6320@salam.uitm.edu.my; omar.safiah@gmail.com

F. Noordin
Centre for Postgraduate and Professional Studies, Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
e-mail: fauziah716@salam.uitm.edu.my

N.A. Ishak
Arsyad Ayub Graduate Business School, Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
e-mail: noormala317@salam.uitm.edu.my

36.1 Introduction

The intense competitions in the education industry demanded the higher learning institutions to measure their organizational performance, specifically in evaluating whether the main objectives of the university achieve the targeted annual performance indicators (Chen et al. 2009). Indeed, the rapid establishment of private higher learning institutions in Malaysia under the enactment of the Private Higher Education Institution Act (PHEIA) (Wan 2007) has able more private higher education institutions to enter the Malaysian market. As a result, the public institutions of higher learning (PIHEs) are no longer the exclusive delivery centres for higher education in Malaysia. This further lead to the education industry being more competitive and thus makes educational quality among PIHEs becoming more critical than ever.

Having said all this, it is important for the academic institutions in Malaysia to not only have consistent performance but also established performance measurements in order to maintain the quality of services at par as required by the stakeholders (Chen et al. 2009). The factors that may impact the organizational performance varies according to the specific core functions of the particular organization (Chen et al. 2009). As PIHEs core functions are to educate students, teaching, seek academic development, embarking on research and scholarships, and calibrate with industrial development demands (Johnes and Taylor 1990; Tang and Zairi 1998), it is interesting to explore one of the factors that might influence organizational performance namely, organizational innovativeness. Organizational innovativeness is indeed an important construct for PIHEs in order to ‘manufacture innovations’ by facilitating innovative work outputs that will further contribute to competitive advantage for the institutions.

Thus, the aims of this study specifically are to: (1) determine the level of organizational innovativeness and organizational performance; and (2) to investigate whether organizational innovativeness has any influence on the constructs of organizational performance.

36.2 Literature Review

36.2.1 *Organizational Innovativeness*

The term organizational innovativeness (OI) derived from the word ‘innovate’ which consists of openness to new ideas as an aspect of firm culture (Rogers 1995). Innovativeness is referred to the innovative capability and for the purpose of this study, organizational innovativeness consist of the capability to initiate, develop and/or implementing new ideas, products, or technologies (Lin 2006). Indeed, findings and conceptualization on innovation among PIHEs is still lacking (Kieser and Koch 2008). The context in which organizational innovativeness is used in this study is the willingness of the organization to encourage and support the innovation

among the employees by providing the development of new knowledge and insights (Hult et al. 2004; Hurley and Hult 1998). Apart from being implemented in research agencies, it is suggested that organizational innovativeness should be implemented in PIHEs as they are also responsible in ‘manufacturing’ innovations (Nordin et al. 2013; Siti Norezam et al. 2014). The context of organizational innovativeness in this study includes the whole organization and not referring to any specific department such as marketing or research development.

36.2.2 Organizational Performance

Performance is normally measured by the extent of specific objectives achieved (Shieh 2011). As there is no definite definition for organizational performance, it is important to note that organizational performance has been measured in different ways according to its respective context (Stainer 1999; Stankard 2002). Organizational performance is indeed the product of interactions of different components or units in the organization (Stainer 1999). The highly need for competitive quality education in academic institutions bringing up the need for the institutions to come up with ways for improvement in such areas (Lawrence and McCullough 2001). This is related to the development for performance measurement indicators which are used to assess the performance level of the academic institutions (Sukboonyasatit and Thanapaisarn 2011). Thus, the development of performance measurement indicators that is specific to be used in academic institution is vital.

In this study, organizational performance refers to the outcomes of various educational related processes which occur in the course of its daily operations (Hussein et al. 2013). Since there is limited literature on what consist of organizational performance in the context of PIHEs in Malaysia, it is proposed that organizational performance is represented by various dimensions such as school reputation, quality of students, research results curriculum planning and community involvement (Chen et al. 2009). The concern derive at the establishment of specific organization performance indicators for universities because most current evaluation indicators in the literature unable to measure the specific educational types of performance (Sukboonyasatit and Thanapaisarn 2011; Yang and Chen 2004). Thus, the establishment of the specific performance indicator (Chen et al. 2009) enable this study to capture the current Malaysian PIHEs’ organizational performance as it represents system performance of a PIHE as a whole (Spee and Bormans 1992).

36.2.3 Organizational Innovativeness with Organizational Performance

Organizational innovativeness was previously found to have association with organizational performance (Armour and Teece 1978; Salge and Vera 2009; Subramanian and Nilakanta 1996; Walker 2005). The results however are rather conflicting where

the usual positive relationship (Subramanian and Nilakanta 1996) found between the two constructs were also found to be indifferences (Damanpour and Evan 1984). The more conflicting results found that those who late in adopting technologies were found to have higher performances compares to those early adopters (Antonelli 1993). Thus, this study explores the potential relationships that might be significant between the two constructs. Specifically, this study is predicting that the higher level of organizational innovativeness will increase the level of organizational performance among in Malaysia.

36.3 Method

The quantitative method is used in this study in order to assess the level of study variables and to explore whether there are relationships existed between learning organization and organizational innovativeness with organizational performance. It also aimed to measure the relationship (if any) based on past researches that has been established in the west which reported on the existence of this particular relationship.

36.3.1 Respondents

The sample of the study consists of 88 academicians from various public universities in Peninsular Malaysia. There were 60.5 % of females and 39.5 of percent males. Majority of the academicians who participated in this study are holding DM/DS45 position level (50 %) followed by DM/DS52 (25.6 %). Most of the respondents are also attached to faculty (63.5 %) followed by those who are attached to the faculty with responsibility in the administration work (28.4 %).

36.3.2 Measures

Far too little instruments available that assessed on the educational organization aspects in terms of organizational performance. Despite that, the instrument was adapted from Chen et al. (2009) whom suggested that academic setting performance measurement indicators should cover several aspects. Several importance aspects identified in educational institution for this study are reputation, social/community involvement, student's quality, innovation, faculty's resources, teaching activities, research activities, development target and characteristics, and curriculum planning. The coefficient alpha for reliability analyses ranging from 0.76 to 0.93. Finally, organizational innovativeness' assessment instrument was adapted from Lin (2006) but originally was taken from Hurley and Hult (1998). The instrument has 14-items and the reliability coefficient alpha was 0.95.

36.3.3 Data Analysis

There were 88 questionnaire distributed among the academicians in a public institution of higher education in peninsular Malaysia. The data were collected using drop-off/pick-up method. The questionnaires were self-administered by the respondents.

Descriptive types of analyses were used in this study. The analyses began with the assessment of internal consistencies. The coefficient alpha was tested and those variables must achieved above 0.60 (Nunnally 1967). Then, the frequencies of the data were examined by generating the means and standard deviation of the items as well as the respondents' demographic information. Correlation analysis (bivariate) was conducted next in order to determine the existence of the relationships between all the variables assessed. Finally, multiple regressions analyses were conducted as to identify whether the there was significance impact existed between the independent variables which is organizational innovativeness with the dependant variable which is organizational performance.

36.4 Results

36.4.1 Descriptive Analysis

Referring to Table 36.1, total means for organizational innovativeness ($M=4.84$; $SD=0.84$), and organizational performance ($M=4.89$; $SD=1.02$) were at moderate level.

The social/community involvement constructs scored the highest mean at 5.52 ($SD=1.01$) for the constructs of organizational performance. The mean score for research activities was the lowest ($M=4.48$; $SD=1.07$) followed by innovation ($M=4.63$; $SD=1.04$). The respondents regarded their universities as having lower research activities while higher in having activities with social/community involvement.

36.4.2 Correlation Analysis

Referring to Table 36.2, organizational innovativeness scored high correlations with all organizational performance constructs but the lowest score was for social/community involvement ($r=0.449$; $p\leq 0.01$). Highest correlations found between organizational innovativeness with development target and characteristics ($r=0.745$; $p\leq 0.01$). This result indicates that as compare to other organizational performance, social community involvement has the lowest impact from organizational innovativeness whereas development target and characteristics influence the most by the existence of organizational innovativeness in the PIHE. The associations also found

Table 36.1 Mean score for learning organization, organizational innovativeness, and organization performance

Dimensions	Mean	Std. deviation
<i>Organizational performance</i>		
Reputation	4.57	1.11
Social/community involvement	5.52	1.01
Student's quality	4.90	0.89
Innovation	4.63	1.04
Faculty's resources	4.77	1.00
Teaching activities	5.16	0.93
Research activities	4.48	1.07
Development target and characteristics	4.96	1.09
Curriculum planning	5.03	1.07
Total for organizational performance	4.89	1.02
Organizational innovativeness	4.84	0.84

Note: 1.00–3.99 = low; 4.00–4.99 = low-moderate; 5.00–5.99 = moderate-high; 6.00–7.00 = high

between organizational innovativeness with other constructs of organizational performance such as curriculum planning ($r=0.671$; $p \leq 0.01$) followed by research activities ($r=0.668$; $p \leq 0.01$), innovation ($r=0.634$; $p \leq 0.02$), reputation ($r=0.615$; $p \leq 0.01$), faculty's resources ($r=0.565$; $p \leq 0.01$), student's quality ($r=0.554$; $p \leq 0.01$), and teaching activities ($r=0.543$; $p \leq 0.01$).

36.4.3 Multiple Regressions

Multiple regression analyses were conducted in order to assess whether the relationships exist between organizational innovativeness with organizational performance are significance. Linear multiple regressions were used in order to identify the constructs that have any relationships with the constructs in organizational performance. In Table 36.3, organizational innovativeness was related to almost all the constructs of organizational performance except *social/community involvement*. The highest B coefficient value is found between organizational innovativeness and development target and characteristics ($B=0.678$; $p \leq 0.001$). There are 62.3 % of variances for development target and characteristic explained by organizational innovativeness with the R-square value of 0.623. The Beta for curriculum planning was 0.671 ($p \leq 0.001$) with the R-square of 0.450 which means that 45 % of its variance was explained by organizational innovativeness. On a similar note, with the R-square value of 0.474 between organizational innovativeness and research activities showed the importance influence that innovation brings in enhancing research experiences among the academicians.

Table 36.2 Correlations analysis for organizational innovativeness and organizational performance

Variable	1	2	3	4	5	6	7	8	9	10
1. Reputation	1									
2. Social community involvement	.387**	1								
3. Students quality	.572**	.387**	1							
4. Innovation	.642**	.464**	.532**	1						
5. Faculty's resources	.572**	.382**	.762**	.659**	1					
6. Teaching activities	.539**	.610**	.771**	.544**	.689**	1				
7. Research activities	.632**	.417**	.599**	.728**	.750**	.686**	1			
8. Development target and characteristics	.576**	.445**	.573**	.556**	.592**	.647**	.751**	1		
9. Curriculum planning	.502**	.540**	.590**	.538**	.569**	.787**	.694**	.750**	1	
10. Organizational innovativeness	.615**	.449**	.554**	.634**	.565**	.543**	.668**	.745**	.671**	1

** . Correlation is significant at the 0.01 level (2-tailed)

Table 36.3 Multiple regression analyses for learning organization and organizational innovativeness with organizational performance

Organizational performance	R ²	F-value/sig	Independent variable	B	T-value/sig
Reputation	0.378	52.362/0.000	Organizational innovativeness	0.615	7.236/0.000
Student's quality	0.307	38.075/0.000	Organizational innovativeness	0.554	6.170/0.000
Innovation	0.437	32.996/0.000	Organizational innovativeness	0.484	4.633/0.000
Faculty's resources	0.319	40.340/0.000	Organizational innovativeness	0.565	6.351/0.000
Teaching activities	0.330	20.962/0.000	Organizational innovativeness	0.429	4.127/0.000
Research activities	0.474	38.314/0.000	Organizational innovativeness	0.537	5.407/0.000
Development target and characteristics	0.623	46.288/0.000	Organizational innovativeness	0.678	8.281/0.000
Curriculum planning	0.450	70.528/0.000	Organizational innovativeness	0.671	8.383/0.000

36.5 Discussions

This study firstly intended to assess the level of organizational innovativeness and organizational performances. Secondly, the correlations between organizational innovativeness and the constructs of organizational performance were tested, and finally the relationships were tested whether they were significance using multiple regressions. The existence of organizational innovativeness within organizations, specifically for academic institutions among public higher learning institutions may improve the level of certain organizational performance constructs.

Using descriptive statistics, the means for all constructs were at moderate level where social/community involvement score the highest mean within organizational performance constructs. However, social/community involvement has the lowest correlation with organizational innovativeness and there was no significance relationship existed between the two constructs in regressions analysis. The result infers that the emphasise of innovativeness culture in PIHE would not contribute to the level of social responsibility among the academics.

On a different note, the existence of organizational innovativeness highly influenced the level of development target and characteristics as well as the curriculum planning of the public universities. This somehow confirmed previous findings on the influence of organizational innovativeness on organizational performances (Armour and Teece 1978; Damanpour and Evan 1984; Salge and Vera 2009;

Subramanian and Nilakanta 1996). In academic institutions, the relationship between the organizational innovativeness and organizational performance is important. This is because the challenges that the academic world is facing far too great with the influence of information and communication technology (ICT) which include the existing of social media that become partly important among the current students in PIHEs. The impact that organizational innovativeness bring on the development target and characteristic conclude that strategic planning of a university can be in better position with innovation. This can also be supported by the strong relationships found between organizational innovativeness with curriculum planning. Innovativeness culture in the academic institutions highly influence the direction of a particular university is heading either for the specific area such as departments and/or units as well as the direction for the whole institution as a one entity.

The findings also found that organizational innovativeness have great influence on research activities among the academicians. This is very important because the enhancement for greater research activities within academic industry can further extend the credibility of the academics (Siti Norezam et al. 2014). There were about 47 % of research activities proportionate of variance explained by organizational innovativeness. This showed that the contribution that the academics bring in research activities can be greater when the innovativeness culture is emphasize further by an educational institution.

36.6 Conclusions and Recommendation(s)

The priority must be identified within PIHEs in Malaysia because being innovative can contribute to many aspects of PIHEs' performances. Although academic institutions are related to knowledge acquiring, the adoption of innovation culture are still limited. The findings of this study, provide evidence that the existence of organizational innovativeness in organization particularly in public institution of higher education in Malaysia can influence the total performances of the PIHEs towards better development. The implementation of bringing the innovative culture among the academicians are now depends on the decision of the academic management of whether to see innovation as a strong and/or weak influence over education quality within the higher education institutions. Next, further studies should look into expanding the sample sizes so that higher version of analysis can be conducted such as partial least square and/or structural equation modelling in order to obtain comprehensive results. Finally, longitudinal and comparative studies also can be conducted in order to look at the differences between private and public institutions of higher educations. The performances measurement indicators can be varies between the two types of learning institutions and thus, worth to be investigated.

References

- Antonelli, C. (1993). Investment and adoption in advanced telecommunications. *Journal of Economic Behaviour and Organization*, 20, 227–245.
- Armour, H. O., & Teece, G. J. (1978). Organizational structure and economic performance: A test of the multidivisional hypothesis. *The Bell Journal of Economics and Management Studies*, 9, 106–122.
- Chen, S.-H., Wang, H.-H., & Yang, K.-J. (2009). Establishment and application of performance measure indicators for universities. *The TQM Magazine*, 21(3), 220–235.
- Damanpour, F., & Evan, W. M. (1984). Organizational innovation and performance: The problem of organizational lag. *Administrative Science Quarterly*, 29, 392–409.
- Hult, G. T., Hurley, R. F., & Knight, G. A. (2004). Innovativeness: Its antecedents and impact on business performance. *Industrial Marketing Management*, 33, 429–438.
- Hurley, R. F., & Hult, G. T. (1998). Innovation, market orientation and organizational learning: An integration and empirical examination. *The Journal of Marketing*, 62, 42–54.
- Hussein, N., Mohamad, A., Fauziah, N., & Ishak, N. A. (2013, December 3–5). *Learning organization and its effect on organizational performance and organizational innovativeness: A proposed framework for Malaysian Public Institutions of Higher Education*. Paper presented at the international conference on Marketing and Retailing, Selangor, Malaysia.
- Johnes, J., & Taylor, J. (1990). *Performance indicators in higher education*: Buckingham. Buckingham: The Society for Research into Higher Education & Open University.
- Kieser, A., & Koch, I. (2008). Bounded rationality and organizational learning based on rule changes. *Management Learning*, 39(3), 329–347. doi:10.1177/1350507608090880.
- Lawrence, J. J., & McCullough, M. A. (2001). A conceptual framework for guaranteeing higher education. *Quality Assurance in Education*, 9(3), 139–152.
- Lin, Y.-Y. (2006). *An examination of the relationships between organizational learning culture, structure, organizational innovativeness and effectiveness: Evidence from Taiwanese organizations*. Unpublished doctoral dissertation, University of Minnesota, USA.
- Nordin, A. R. M., Fauziah, W., Rohana, I., & Norlina, U. (2013). A comprehensive innovation management model for Malaysian public higher learning institutions. *International Journal of Software Engineering and Its Applications*, 7(1), 44–55.
- Nunnally, J. C. (1967). *Psychometric theory*. New York: McGraw Hill.
- Rogers, E. (1995). *Diffusion of innovations*. New York: Free Press.
- Salge, T. O., & Vera, A. (2009). Hospital innovativeness and organizational performance: Evidence from English public acute care. *Health Care Management Revision*, 34(1), 54–67. doi:10.1097/01.HMR.0000342978.84307.80.
- Shieh, C.-J. (2011). Study on the relations among the customer knowledge management, learning organization, and organizational performance. *The Service Industries Journal*, 31(5), 791–807.
- Siti Norezam, O., Noorulsadiqin Azbiya, Y., Fadhilah, M. Y., & Risyawati, M. I. (2014). Innovation culture among academicians in biotechnology R&D in Malaysian Research University. *Journal of Technology Management and Business*, 1(1), 83–96.
- Spee, A., & Bormans, R. (1992). Performance indicators in government institutional relations: The conceptual framework. *Higher Education Management*, 4(2), 139–155.
- Stainer, A. (1999). Productivity, performance and paradise. *Management Services*, 43(6), 8–11.
- Stankard, M. F. (2002). *Management systems and organizational performance: The search for excellence beyond ISO9000*. Westport: Greenwood Publishing Group.
- Subramanian, A., & Nilakanta, S. (1996). Organizational innovativeness: Exploring the relationship between organizational determinants of innovation, types of innovation, and measures of organizational performance. *Omega International Journal Management Science*, 24(6), 631–647.
- Sukboonyasatit, K., & Thanapaisarn, C. (2011). Key performance indicators of public universities based on quality assessment criteria in Thailand. *Contemporary Issues in Education Research*, 9(9), 9–17.

- Tang, K. H., & Zairi, M. (1998). Benchmarking quality implementation in a service context: A comparative analysis of financial services and institutions of higher education: Part II. *Total Quality Management*, 9(7), 539–552.
- Walker, R. M. (2005). Innovation and organizational performance: A critical review of the evidence and a research agenda. *Academy Management Proceeding*, August(1), 1–6. doi:[10.5465/AMBPP.2005.18783338](https://doi.org/10.5465/AMBPP.2005.18783338)
- Wan, C. D. (2007). Public and private higher education institutions in Malaysia: Competing, complementary or crossbreeds as education providers. *Kajian Malaysia*, XXV(1), 1–14.
- Yang, C., & Chen, S. -H. (2004). *The establishment of performance indicators for the evaluation of higher education* Paper presented at the conference on Chinese Society for Quality, Kao-Hosing.

Chapter 37

Excellent Teachers' Perceptions on the Causes of Disciplinary Problems Among Secondary School Students

Rosilawati Sueb and Munirah Mohd Izam

Abstract This study investigates the Excellent Teachers' (Guru Cemerlang) perceptions regarding the causes of disciplinary problems among secondary school students. Excellent Teachers are school teachers deemed as exemplary teachers and awarded with the title "Guru Cemerlang" on a promotional basis. The method of data collection employed are semi-structured in-depth interviews and email interviews. The participants of this study are nine Malay Muslim Excellent Teachers; seven females and two males, from nine school districts within Selangor. The Excellent Teachers' range of ages is from thirty seven (37) to fifty three (53) years old. All of the Excellent Teachers teaching experiences in secondary schools are ranging from ten to thirty one (31) years. The data analysis revealed five categories of causes of disciplinary problems among students as explained by the Excellent Teachers which are; personal factors, family factors, teacher factors, peer factor and physical environment factors. Personal factors are characterized by self-limitation and lack of motivation. Family factors are characterized by lack of support from home and responsibilities to support the family. Teacher factors are characterized by teacher inefficiency and unmotivated teachers. Peer factor is characterized by peer influence and, physical environment factors are characterized by classroom, home, and technology.

Keywords Classroom discipline • Classroom management • Classroom misbehaviour • Teacher management

R. Sueb (✉) • M.M. Izam
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: rosil334@salam.uitm.edu.my; munirah406@salam.uitm.edu.my

37.1 Introduction

Dinkmeyer and Dinkmeyer (1976 in Hardin 2008) stress that to effectively work with students, teachers need to understand the students' behaviour goals. Students coming to class must have either positive or negative goals. Students with positive goals will have the motivation to learn, meanwhile students with negative goals or, perhaps unknown goals, may create non-conducive learning atmosphere for themselves and others. Thus, it is imperative for teachers to know the root of the problem to identify the key to the solution (Yuan and Che 2012). A teacher's reaction to a particular misbehaviour should be guided by the goal for the behaviour. Knowledge of the source of students' discipline problems can influence teacher's choices of intervention strategies. Behaviour in the classroom is usually triggered either intrinsically or extrinsically and is, therefore, within or beyond a student's self control. Hence, if teachers' interpretation of misbehaviour is not based on clear knowledge of the root course of the misbehaviour, the teacher would probably choose the wrong strategy which may worsen the discipline problems (Irwin et al. 2005).

There are various causes of misbehaviour in the classroom. Leffingwell (2001) advocates anxiety as one of the causes to maladaptive behaviour. The anxious behaviour may be triggered by test anxiety, public speaking, or the students being assessed for certain activities. The students may display behaviours like "pulling or twisting hair, shaking of hands, feet and legs as if suffering from a palsy" or "protesting in non-verbal behaviours such as forgetting needed material, being consistently late, [and] excessive absenteeism" (p. 361). He further suggests that, much misbehaviour that occurs in the classroom were due to students reacting to their own forms of failure. The students could not seek for alternatives to overcome their problems, which consequently led them to create discipline problems. This would further increase their probability of failure in their study and life. Ho (2004) investigates teachers' causal attributions for student behaviour comparing between Australian and Chinese teachers. Four causes of misbehaviour were selected as the variable of attributional factors, which were ability, effort, family, and teacher. 204 Australian teachers and 269 Chinese teachers were asked to rate the factors. The result showed that both Australian and Chinese teachers attribute students' misbehaviours mostly to student effort and the least is on teacher factors. The study also revealed that Chinese teachers focused more on family factors in contrast to Australian teachers who placed more emphasis on ability. This study indicates the apparent influence of cultural factors on teachers' beliefs of classroom misbehaviour (Ho 2004).

Erbas et al. (2010) investigate the causes of students' problematic behaviours from the perspectives of Turkish (Muslim Eurasian) teachers. A majority of the teachers believe that "the causes of problem behaviours might be influenced by their educational backgrounds, experiences, and cultural beliefs and values" (p. 116). A study by Ametepei (2002 as cited in Irwin et al. 2005) on Ghanaian students has identified excessive punishment meted out to students and low academic achievement as causes to classroom misbehaviour among students. However, Ayensua-Mensah (1984 as cited in Irwin 2005) found out from the cultural perspective that a

large family size plays important role in contributing to students' deviant behaviour primarily because they cannot afford the school fees, school uniforms, and books. Habibah and Nooreen (2011) interviewed 113 at risk students in 25 secondary schools in Malaysia. The result of their study indicated that the students reported having family troubles. The problems were in the form of being deprived of parents' attention, difficulties in communication and bad relationship between parents.

Alfie Kohn (1995) argues that students create problems in the classroom because they are bored and it is a way of passing time. Torff and Sessions (2005) contend that "the most common perceived causes of teacher ineffectiveness concerned three of the four components of pedagogical knowledge – classroom management skills, lesson-implementation skills, and rapport with students." (p. 535). They claimed that teachers are not well prepared for the learning session or too much time is given to certain uninteresting activities that students look for alternatives to fill in their time. It is also due to teachers who focus too much attention on subject-matter preparation and not in discipline management (Smith 2001). It may also be the case, that, to some degree, teachers' responses to misbehaviour in the classroom may be mediated by their beliefs about themselves, their efficacy in dealing with the misbehaviour, and their beliefs about the causes of the students' misbehaviour (Martin et al. 1999). In this situation, it is suggested that, when classroom misbehaviour occur, teachers may be the problem Wasicsko and Ross, 1994).

Tilestone asserts that students' behaviour most commonly recognised as behaviour problems in the classroom are actually off-task behaviour. Students may not see the relevance of learning, are constantly bored (Alfie Kohn 1995) and have anxiety over the in-class activities so they tend to avoid them. She further states that "all discipline situations have three variables: the teacher, the problem student, and the rest of the class" (p. 20). Among the three variables that a teacher can control is the teacher themselves (DeBruyn 2015). An effective teacher knows when to change classroom strategy so that behaviour problems can be prevented, hence entailing the teacher as the primary adjuster. However, Tilestone also pointed out that not all behaviour problems in the classroom due to off-task behaviour are minor problems, there are also some major causes of misbehaviour which are; the need for attention, power, revenge, and self-confidence. These causes of misbehaviour are exhibited in various types and forms of disciplinary problems. However, these are merely a display of superficial reasons. Further investigation by the teacher would reveal the real causes of misbehaviour such as problems with the family, teacher, learning environment, the society, and others.

Another cause of misbehaviour in the classroom is due to developmental differences. Arcia (2007, as cited in Evans and Lester 2010), pointed out that middle school students have higher probability that is four times more to be suspended than elementary school students. Suspension and expulsion rates have also risen in middle schools. This phenomenon suggests that the increase in misbehaviour in middle school is due to students' difficulties in adapting to the transition from elementary school. Walsh (2004) states that changes in the brain during adolescence can contribute to troublesome behaviours, probably due to the incomplete development of

pre-frontal cortex that involves human planning and impulse control. This immature brain region could lead teenagers into wrong doings if there is a lack of proper guidance from family, schools, and society.

Yuan and Che (2012) assert that there is an obvious relationship between learning difficulties and misbehaviours in the classroom. Students with learning difficulties may experience constant failures in academic that would concurrently affect their self-esteem. Since the students could not perform well in academic, they might spend time doing other things such as talking with their classmates, playing paper balls and other non-academic activities. The frequent failures in academic achievement will inadvertently led the students to negative feelings about classroom work and the school. Ameen et al. (2012) carried out a large survey on Jordanian secondary school students, of approximately 6700 students. One of the variables that the study investigated was on the relationship between academic achievement and student misbehaviour. The study revealed that students with lower academic achievements are more likely to be involved in behaviour problems compared to students with higher academic achievements, suggesting low academic attainment as a probable factor contributing to student misbehaviours in classroom. Accordingly, students who are fond of misbehaving in the classroom such as not paying attention to teachers teaching and not completing the coursework will consequently receive poor academic results. As a whole, the correlation between student misbehaviour and low academic attainment is twofold. It can be either the low academic performance which prompts students to misbehave in order to express their dissatisfaction and frustration in the classroom or it can be prior misbehaviour and frequent distraction from class which results in poor grades (Ameen Mohammed et al. 2012, p. 127).

In short, the causes of misbehaviour are diversified; resulting from external influence such as family situations, peer relationships, or from within the classroom environment such as the physical environment and seating arrangements, the teacher, student-teacher interaction, the lesson-plan delivery, and also the student's self performance. The consequences of misbehaviour have impact on both the students and the teacher. An absence of proper strategies to overcome the students' misbehaviours would lead to high possibilities of school failure. Students with problematic behaviours such as task avoidance, unable to focus on the classroom activities, hyperactivity, and aggression have high possibilities of school failure because these behaviours interfere with their learning abilities (Thompson and Webber 2010). Meanwhile, the impact on the teacher exhibits that even small disruptive behaviours may lead teachers to increased feeling of burnout and stress, and drain teachers' energy. Manning pointed out that it is essential to identify the causes of misbehaviour. The teacher will have better preparation for classroom situation and by finding out the causes, put effort in eliminating the causes of misbehaviours rather than focusing on corrective measure (Manning and Bucher 2007) and this could enhance learning and instruction.

The previous Deputy Minister of Education, Datuk Dr. Wee Kah Siong reported that according to the Ministry of Education's record, a total of 111,484 students of whom 72,557 were secondary schools students and 38,927 primary school students

were involved in a variety of disciplinary problems in 2010. He elaborated that 17,595 students were involved in crime, 19,545 involved in truancy, 18,346 involved in behaving inappropriately, 21,384 involved in improper appearance, 17,808 did not concern with time, 3031 involved in obscenity, 5212 cases of vandalism, and 8563 cases of mischievousness (“Masalah pelajar masih terkawal,” 2010). Stealing, destroying property, truancy, and gangsterism among others have been around for many years but now students are more daring and the occurrence are more rampant. “Their minds and hearts have not changed, but they become bolder” (Vijandren 2010). Nonetheless the negative situations in school need to be addressed so that teachers and students are able to teach and learn in a more conducive environment.

This study is carried out to investigate, adopting the qualitative study approach, the causes of discipline problems in the classroom as experienced by Excellent Teachers in the context of secondary schools in the district of Selangor. This is due to the overwhelming numbers of classroom misbehaviours and the necessity in understanding the causes of these misbehaviours, so that appropriate measures can be suggested and taken. This study hopes to contribute to the body of knowledge that addresses problems of classroom discipline management in Malaysian secondary schools. The ability to manage the classroom is crucial in order to bring about effective teaching and learning environments both for teachers and students.

37.2 Methodology

The study adopted the qualitative research approach through a basic interpretive qualitative study (Merriam 2009). Semi-structured in-depth interview of Excellent teachers was the primary source of research instrument in this study. This research focuses on “Guru Cemerlang” or Excellent Teachers (ET) who teach in secondary schools in the state of Selangor. In this study, Guru Cemerlang (Excellent Teachers) are teachers who received the title “Guru Cemerlang” due to promotional exercise. These are teachers who are deemed experts in their teaching and have shown high qualities in their personality and leadership as well as vast teaching experience. Their expertise and excellence are reflected through the assessment of personal excellence, excellence in knowledge and skills, excellent work, excellent communication and excellent potential (Kementerian Pendidikan Malaysia, Guru Cemerlang, Borang Permohonan Guru Cemerlang, n.d).

37.2.1 Participants

The participants of this study consist of nine (9) ETs who are attached to secondary schools located in nine different school districts in Selangor – Gombak, Kuala Langat, Petaling Perdana, Petaling Utama, Hulu Langat, Klang, Sabak Bernam, Sepang, and Kuala Selangor. Pseudonyms were given to each participant. The ETs’

schools comprised of two (2) schools from the vicinity of urban areas, four (4) schools located in the suburban areas, and three (3) schools located in the rural areas. The ETs' age ranged from 38 to 54 years old. Two (2) of the ETs are male teachers, and the remaining seven (7) are female teachers, which is considered reasonable since the majority of ETs and school teachers are female. All of them have accumulated vast work experience ranging from 10 to 31 years and all are Malay and Muslim teachers. Most of the selected ETs have been in tenure as "Guru Cemerlang" (Excellent Teacher) for about 4 years except for ET6 with 7 years tenure. Two (2) of them have Master's degree, and one ET is completing her Master's degree, while the remaining ETs have their first degree in education. The ETs specialise in different disciplines. ET1 teaches "Pengajian Am," ET3 teaches "Bahasa Melayu," ET4 teaches English, ET2 and ET5 teach Science subjects, ET6 teaches "Pendidikan Islam," ET8 teaches Accounting, and lastly, ET7 and ET9 teach History. These ETs are a considerable heterogeneous samples for this study and reflect the maximum variation strategy which could contribute robustness to the findings. Member checks and peer examination were conducted for trustworthiness. The transcripts of the interviews were transcribed and coded. An analysis using constant comparison method were employed which utilised the open coding and axial coding to arrive at the themes. The lowest levels of analysis are codes representing concepts that are formed directly from the data. These are concepts that emerged from the meaning of the data as it was analysed comparatively and other concepts are "in-vivo codes" that is the concept that were taken from the words of the participants. The concepts are then linked together based on their similarities and differences and form categories (Strauss and Corbin 1998).

37.3 Result

The major categories in the causes of misbehaviours were based on the ETs' feedback of their personal observations on the reasons of misbehaviours in the classroom. The Excellent Teachers, through their years of experiences in handling students' problems in school, perceived that there are various reasons that contribute to the increase in students' disciplinary problems in the classroom. Based on the analysis, the researcher categorised the causes of misbehaviours into five categories: personal factors, family factors, teacher factors, peer factor, and physical environment factors.

37.3.1 *Personal Factors*

The first category in the causes of misbehaviour is personal factors, involving problematic behaviours in the classroom that resulted from the student himself or herself. The *personal factors* category emerged from two sub-categories which are 'self-limitation' and 'lack of motivation.'

- (a) 'Self-limitation' is defined as certain limitations that the students possessed which could lead to misbehaviours in the classroom. Lacking in language proficiency in a language classroom has the potential to cause misbehaviour in the classroom. According to ET1, she once had a student with difficulties in communicating using the main medium of instruction in the classroom. This limitation caused the student to experience a high level of inferiority affecting her focus in lessons and she would consequently disregard the lessons. Meanwhile ET5 reported that some students could not read nor write despite being in the secondary school "Another thing is that (they) cannot learn. (They) are unable to write or read" (ET5). However, there are students who were not illiterate but they have difficulties in understanding and thinking critically on the reading assignments. Another problem that the ETs faced are students who have poor abilities in grasping academic subjects despite performing well in skill-related subjects. The aforementioned situations led these students into committing discipline problems because they have difficulties and a lack of interest in learning. Besides learning related problems, another factor contributing to discipline problems was in the form of immature thinking. ET6 reported that some students might react and behave disorderly in the classroom because they lack the maturity. The students' reactions and behaviour assumed childish like behaviour such as impulsiveness and selfishness.

Extremely immature...too emotional, impulsive. The raging temper too. They want everything to be their way, this means immaturity, childlike thinking, but that is what we need to correct. (ET6)

Another important aspect to proper conduct in the classroom, but may be lacking in some students, is religious knowledge. According to ET9, some students do not perform their obligatory prayers (solat) and do not possess strong religious background. The understandings of what is right or wrong are present superficially in the students' personality, thus this suggests the understanding of proper conduct may not be properly internalized.

- (b) 'Lack of motivation'. The second sub-category relevant to the personal factor theme is identified as 'lack of motivation'. 'Lack of motivation' refers to students who lack motivation and enthusiasm to pursue learning in the class. ET2 reported that problematic students showed no interest to study and possess no motivation to learn and they spend their learning time doing non-useful behaviour and interrupting others.

But he lacks motivation, there is no drive for him to attend school. He lacks ambition. He would just go to school, go back home, go to school and go back home, that's just it. He is unable to sit still in class, not even for 5 minutes, there will be warnings, reprimands, but he would repeat the same behaviour... disturbing other students maybe as time-fillers... most probably because he is unable to follow the TnL, so he disturbs his friends. (ET3)

ET3 further claimed that these students attended school just because their parents asked them to or otherwise their parents will scold them. "He is just fulfilling his parents' wishes. His reason is; my mother told me to go to school. My father told me to go to school. My mother will cause chaos if I don't go to school" (ET3). ET9

added that these students attended school because they need the pocket money from their parents. These students may have vague ideas of the objectives of attending school. They failed to understand the reasons for schooling and have no future visions.

To me these kids lack objectives, no visions, making them problematic. They do not know the reasons for attending school. (ET9)

ET9 also mentioned that the problematic students do not have long-range visions, and their immediate concerns are merely to fulfill their desires at the present time with the little money they have.

37.3.2 *Family Factors*

The second category in the causes of misbehaviour is the *family factors* theme. Family factors emerged from two sub-categories; 'lack of support from home' and 'student supports family'.

(a) 'Lack of support from family' means that the students did not receive the necessary support and attention concerning their studies and daily life either from their parents or family members. The majority of the Excellent Teachers agreed that many students assigned to the poor performance classes and with disciplinary problems also come from problematic home background. One of the Excellent Teachers, ET2 mentioned that when the students' parents were divorced, a few of the students ended up staying with their grandparents or other siblings, which suggested that they are separated from their parents and are deprived of proper love attention from their parents.

Those are among the students lacking in attention. Quite a majority of my students, those in the last classes. When properly surveyed, more than half of them have home troubles... cases of divorced parents, living with their grandparents, staying with a sibling. We can deduce that they belong to those lacking proper care and attention. (ET2)

ET8 mentioned that students belonging to broken families also experienced being yelled at, at home which somewhat influenced their negative behaviours in the classroom.

Sometimes there are those from broken families. Without love and proper attention. Those being yelled at, at home. So, they will emulate the same behaviour when in school. (ET8)

Due to the fact that these students are already facing family problems at home, there is an absence of the necessary guidance and support from the family. ET1 claimed that there is no support for the students in terms of learning despite not hailing from poor families. The parents would leave some money for their children and left their children to manage for themselves. There was no quality time in the family. ET9 reported that students did not get the necessary religious guidance because their own parents did not emphasize on and perform the obligatory religious practices such as the prayers (solat) and fasting during the month of Ramadhan.

The parents failed to perform the prayers. Hah. The children then obviously do not pray as well. The problem is that when 100 students are asked about praying, almost 90 do not perform the prayers... and there is a PPRT. Perumahan Rakyat Termiskin (Housing for the poor). When the majority of the students hail from the housing area, most of them are lacking in terms of their religious values. Because the parents are lacking as well. There was once when a teacher went to one of the student's home because of exam matter. Because the students failed to turn up in school. [They replied] that SPM is in the fasting month. The student's mother was <...>, was kneading some dough, etc... They don't really fast. (ET9)

As students in the secondary school and in the process of growing up, undivided attention and love are essential factors for mental and emotional developments. However, many of these students are lacking in these aspects. ET6 said that the problematic students do not have the necessary attention from their parents because both parents are busy making an earning for the family. The parents may not have realised whether their children are actually attending school or are playing truant. Some parents rarely see their children for the whole day because of the working hours.

If we were to investigate the students from the problematic classes, most of them come from such backgrounds. The mother is never home, the father is not at home as well, because of work. They are not able to monitor their children's whereabouts, are they outside the home? in school or not in school?... I am at work; I don't know where my child is. Sometimes when we give the mother a ring, the mother is sleeping after her work shift. She returned home just to sleep. She doesn't know whether or not her child is attending school. That is for most of them. The percentage of students living such lifestyles outnumbered the rest. (ET6)

ET7 reported that most of her students come from poor families with both parents working as fishermen. Their parents would return home late and would sleep in the next day, hence the students are not provided with breakfast and they also did not get to see their parents before leaving for school. The students have been attending school on empty stomachs.

First, they do have parents but are from poor families, e.g. with both parents as fishermen. The parents would go out to make a living on a daily basis; no attention is paid on the children, not enough time for that... sometimes I would ask the students whether their mothers have prepared them breakfast, sometimes I would keep track... the children would be in school while the mothers are still sleeping... How can the mothers be up at breakfast if she were to return at 1 or 2 in the morning... they are sleepy. The children would go to school on empty stomachs... when we ask them 'did you kiss your mother's hands? Did you hug her?' 'No...' (ET7)

ET2 stated that some parents failed to place high consideration on their children's learning materials and scolded the teacher for asking for contributions. ET7 said that these type of parents probably did not understand the importance of education for their children.

The family belongs to an uneducated environment, no proper education. So they do not understand the importance of education. (ET7)

(b) 'Student supports family' The second sub-category of family factor is 'student supports family.' This sub-category is defined as the responsibilities that the stu-

dents have to uphold to support the family. The large responsibilities as a student and a child and also battling time constraint resulted in some students being involved in disciplinary problems in school such as not turning in homeworks, sleeping in class, or coming in late to class. Due to poor family conditions, some students have to help their parents by working alongside their parents. ET1 mentioned that some students have to help their parents either in the morning before school or after school or sometime at both times.

They would have to help their parents after school. Some students just help the fathers at the morning market. There is one that helps his father at the market in the morning before school, and helps his mother in the saloon in the evening. There is no time for rest. (ET1)

ET2 mentioned that some students work at night slaughtering chickens and that some students skipped school to look after their siblings. ET4 reported that some students work because he/she needed to support the family because the father is absent.

So those playing truant is most probably because of family problems. Looking after siblings at home. (ET2)

37.3.3 *Teacher Factors*

The third category in the causes of misbehaviours is ‘teacher factors’. ‘Teacher factors’ is formed from two sub-categories, which are: ‘teacher incompetency’ and ‘teacher not motivated.’

(a) ‘Teacher incompetency’ is about teachers who are unable to perform efficiently and effectively in teaching and educating the students. The first element here is when teachers constantly talk about their personal lives. According to ET4, some teachers do minimal teaching and include unrelated matters to their lessons such as talking about their personal lives in the classroom.

and then, mind you, there’re also teachers who will tell the students all about their personal life, and this student.... ‘teacher, teacher you know or not... Just now hah... This teacher said, her daughter lah, her children lah’. (ET4)

ET4 also said that there are teachers who failed to make an effort at remembering their students’ name.

Without that... I mean, if you don’t know their names, how are you going to address them? Eh you! Eh you! Eh you here! Eh you there! They are not being appreciated. They have names. Hah! So, I think that’s one of the ways on how I work hard. (ET4)

In some cases, ET4 reported that some teachers have sets of rules prescribed to their students, however the teacher did not reinforce the rules when rules were broken. ET4 also pointed out that ICT (Information and Communication Technology) could be beneficial to the process of instruction and learning in the classroom.

However, some teachers are too engrossed in preparing for the use of ICT; to set up the equipment such as the computer and projector may take up some time and occasionally the equipment would malfunction. Unfortunately, the teachers tend to ignore the students, who would start feeling restless waiting for the teacher to begin teaching. According to ET1, some teachers are inconsiderate in terms of acknowledging that students are assigned with many assignments from other teachers too and would demand the students to fulfil all his/her requirements.

Because I do know one or two teachers known to put too much pressure on students in class. You must do this, that, this so many things. (ET1)

ET1 also reported that some teachers gave inconsistent and unclear instructions which could create confusion for the students and as a consequence, the students were not able to complete their work.

And these teachers would be inconsistent in giving out instructions, today one thing is right. The next day, another thing is right. So the students tasks are unsettled. The students get stressed out. (ET1)

ET5 recalled that some teachers tend to focus on certain groups of students and not others in the classroom, in which the teachers failed to give equal attention to all students.

So that is necessary... teachers like that... when a teacher is focused only on a particular group of students in class, the rest is neglected... haaa. That is very common. (ET5)

ET5 also commented that teachers are given too many tasks to perform affecting them in performing effectively, as a consequence aspects of students' discipline in the classroom are taken lightly.

But, that is it...when one has too many tasks at hand; they have no time to consult with the Principal. Upon posting, hah, one is burdened with a mountain of work. Now we have the online SAT. Teachers must do this, do that...a teacher's role is too diversified; attending the sick students, and as such. Too many tasks to handle, too much burden. So sometime, disciplinary problems are not attended to. (ET5)

(b) 'Teacher not motivated' is about teachers who could not perform their best in teaching and educating because they do not have the motivation and enthusiasm to teach. These teachers just seemed not to care and not to bother. ET4 recalled that there are teachers who have no concern about their own students.

They just couldn't be bothered if the student greet them.. If the students don't, if the student...how the students talk to them. They just couldn't be bothered. (ET4)

ET4 added that some teachers thought they have fulfilled their commitments by just teaching in class but in actuality, the teachers did properly teach and educate the students.

They feel that.. Okay, it's okay, my job here is just to teach you. But then, sorry to say, they didn't even teach. Hah!. They not..not.. They teach. They didn't even educate. (ET4)

37.3.4 Peer Factor

The fourth category in causes of students' disciplinary problems in the classroom is 'peer factor'. Peer factor is defined as in how peers can bring about negative influence onto students and, hence tamper with their learning process in the classroom. ET9 reported that some students like to stay out late nights with their friends.

They would return home late, out loitering. There are two categories, kak. There are those that do not have to work but spend their time loitering up until 2am, 3am. They would always sleep in class. (ET9)

ET9 also reported that some students are occupied with non-beneficial activities at the cybercafes such as in playing computer games.

But they are also heavily influenced by the entertainment world. Going to the cybercafes. Kids, they can sit there for 8 hours and skipped school. (ET9)

ET5 pointed out that flocking together in students' own race can also lead to problems because these students have a tendency to flock among themselves, immersed in their own activities, and ignored teachers' presence.

The cause to extreme noisiness is when the students flock according to race...Malays, Chinese and Indians. Sitting down in groups talking at the top of their voices. They would disregard the presence of teachers. (ET5)

ET5 also reported that some students have their friends signalling and calling them out from class. These students would exit the class without permission from the teacher. ET9 stated that some students work because they wanted to have the extra money so they can be part of the group.

Another problem here is...The students here love to work. Some are due to poor parents and some are just for fun. Just like earning their own income. To top-up their handset, to purchase personal items. Working as a profession. (ET9)

37.3.5 Physical Environment Factors

The fifth category in causes of disciplinary problems in the classroom is from the physical environment factors. Physical environment includes: classrooms, computer technology, and also homes that the students resided in.

ET8 said that dirty, stuffy and chaotic classrooms are not conducive for learning.

The classroom itself. The classroom must not be chaotic, stuffy and uncomfortable, and littered with thrash. (ET8)

ET9 expressed her sadness that students are too engrossed in Internet and Facebook. The students are mostly influenced into committing immoral activities from improper Internet sites.

But beyond the other reasons, our students...outside influences. There are so many things on the Internet. Too influential. The students are easily influenced. With the Western cultures. That's it. And now the Facebook. Ya Allah. There is everything on Facebook. The language use is deploring. Language is helter skelter. These are the causes. Causing their behaviours. Too much entertainment. They find it difficult to learn, a darkness. Their souls, their religions. (ET9)

ET9 also pointed out that the physical aspects of the students' homes are also a contributing factor to students' discipline problems. Most of the students are deprived of a comfortable surrounding to live and study in because their houses would only have two rooms to share between the parents and many siblings.

Now there are a lot of the low-cost. With only 2 rooms. No renovations. 2 rooms. And many children. That is disturbing. Their houses. (ET9)

37.4 Conclusion and Recommendations

From the analysis, the data revealed that there are five categories in the causes of disciplinary problems among students as explained by Excellent Teachers which are; personal factors, family factors, teacher factors, peer factor, and physical environment factors. Personal factors revolve around the issues of self-limitation that the students possessed such as being illiterate, lack of language proficiency, lack of religious knowledge and impulsive behaviour. This is supported by Walsh (2004), in which he claims that many adolescents behave impulsively, have low self-esteem, and have sensitive feeling that somehow could contribute to students' misbehaviour in the classroom. Meanwhile Kyriacou (2001) asserts that student who have learning difficulties are more prone to misbehaviour because it threatens the student's self-esteem. Having minimal religious knowledge also contributes to discipline problems in the classroom, as religious knowledge is deemed important in moulding one's attitudes and personality. Besides self-limitation as a cause of misbehaviour, lack of motivation also caused students to engage in disciplinary problems. This can be seen when the students slept, and committed non-useful behaviours such as disturbing other students while their friends are learning. ET3 stated that there are students who attended school just because they need to fulfil their parents' orders, and not because of their own motivation to learn. They came to school because they needed the pocket money. Otherwise, they would not have any financial means as they are fully supported by their parents. On top of everything, the students themselves could not properly identify the goals or objectives of schooling.

The 'personal factors' as the causes of disciplinary problems is closely related to 'family factors', which is the second factor. The theme 'family factors' emerged from 2 lower categories; lack of home support and the students having to support their family. Habibah and Noreen (2011) in their study revealed that students misbehaving in school is in relation to family problems, as in the students lacking atten-

tion from parents and minimal interactions within the family institution. Many of the students, as reported by the ETs, hailed from low-income families. As previously discussed, students who lack motivation to learn or have vague ideas of the objectives of schooling, due to improper guidance and attention from their parents, are also those hailing from problematic families such as one with divorced parents. Meanwhile, students with their parents still together did not receive the fullest of attention from their parents as the parents are busy working to make ends meet. The students are provided with financial and/or material supports but not love and attention, and left to manage for themselves. Some students attended school in the morning without greeting their parents because their parents are still sleeping in while the children leave for school. There are those who did not see their parents before or after school because their parents are already at work. While some students from poor families have parents that are unable to provide material support for their children. There are students who came to school on empty stomachs, and could not buy food in school because their wallet was empty as reported by ET7. They reacted impulsively or showed no interest in learning because they lacked the energy. Some of these problematic students have to work to support their family either by working outside or by looking after their many siblings while their parents are out to work. As a consequence, they are constantly tired and could not concentrate in class resulting into a habit of sleeping in class and incomplete class tasks. Religion wise, the students lacking religious knowledge and values are indirectly from non-practising parents. This clearly indicate that parents are direct role models for the students' behaviours and motivation.

The third factor in influencing students' misbehaviour in school is the 'teacher factors'. This refers to a group of teachers that are deemed incompetent in their work and the teachers that lack motivation to teach. One of a teacher's responsibilities is to teach the subject matter but there are teachers abusing the class hours narrating their personal life stories to the students. Besides that, there are also teachers that did not put in much effort in remembering their students' names. Implementation of class rules is extremely crucial but some teachers failed to practise a steadiness in implementing the rules and consequences accordingly. Many proofs are seen in the benefits of implementing ICT in the classroom. However, some teachers are too occupied with the system's technicalities that actual learning time ended up sacrificed. Another important reason in teachers as the cause for students' misbehaviour is the fact that teachers are overloaded with clerical work causing them to, sometimes, ignore the students' well being. Alfie Kohn (1995) contends that misbehaviour occurs in the classroom because students are bored and turn to creating disciplinary problems as a way of passing time.

Peers or schoolmates are discovered as another strong factor in student's behavioural problems in schools. Problematic students have a tendency to stay out all day and/or night loitering in groups causing them not only sleepiness in class but also a tendency to get left behind. The influence of the computer, significantly the Internet has largely impacted students' behaviour and interest into coming to school. Students would play truant as a result of an addiction to the Internet and computer games due to hours spent in the cybercafes. Peer pressures also exist in terms of

disturbance and signalling for students to skip class as well as to earn money to keep up with personal expenditure and a sense of belonging to groups.

The final reason in students misbehaving, according to the ETs, are the physical surrounding such as dirty and stuffy classrooms. Students find it almost impossible to pay attention to lessons when classrooms are not conducive for learning. This factor also indicates that some teachers hold no concern over the cleanliness and the students' welfare in class.

To conclude, the ETs perceived that it is crucial to have an understanding of why students behave the way they do. Knowing the source of students' discipline problems would help teachers to decide on the appropriate intervention strategies. Knowing the personal background of a student will have an effect on how teachers react to the student's misbehaviour. For example, if it is known that a student is having serious problems at home with parents or guardians, then a teacher will most likely be a little more lenient in the handling the behaviour problem. For future studies, an emphasis on researching the strategies teachers use to overcome the disciplinary problems in school should be looked into. It is also important to investigate how teachers obtain knowledge of said strategies.

References

- Ameen Mohammed, M. M., Sharifah, M. N., Abdul Rahman, B. M. A., Nur Surayyah, M. A., Bahaman, A. S. (2012). Misbehavior in Jordanian secondary schools. *Asian Social Science*, 8(6), 121–131.
- DeBruyn, R. L. (2015). *Every discipline problem has three variables*. Retrieved September 15, 2015, from <http://blog.masterteacher.com/every-discipline-problem-has-three-variables/>
- Erbas, D., Turan, Y., Aslan, Y. G., & Dunlap, G. (2010). Attributions for problem behavior as described by Turkish teachers of special education. *Remedial and Special Education*, 31(2), 116–125.
- Evans, K., & Lester, J. (2010). Classroom management and discipline: Responding to the needs of young adolescents. *Middle School Journal*, 41(3), 56–64.
- Habibah, E., & Nooreen, N. (2011). The influence of parents in adolescents' misbehavior. *Journal of Social Sciences*, 7(3), 423–427.
- Hardin, C. J. (2008). *Effective classroom management* (2nd ed.). Upper Saddle River: Pearson.
- Ho, I. T. (2004). A comparison of Australian and Chinese teachers' attributions for student problem behaviors. *Educational Psychology*, 24(3), 376–391.
- Irwin, L. H., Anamuah-Menseh, J., Aboagye, K. K., & Addison, A. K. (2005). Teachers' perceptions of classroom discipline in Ghana, West Africa. *International Education*, 34(2), 46–63.
- Kementerian Pendidikan Malaysia. (n.d.). *Definisi Guru Cemerlang*. Retrieved <http://www.moe.gov.my/v/definisisiguru-cemerlang>
- Kohn, A. (1995). Discipline is the problem – Not the solution. *Learning Magazine*. Retrieved from <http://www.alfiekohn.org/teaching/ditpnts.htm>
- Kyriacou, C. (2001). *Effective teaching in schools: Theory and practice*. Cheltenham: Nelson Thornes Ltd.
- Leffingwell, R. J. (2001). Misbehavior in the classroom – Anxiety, a possible cause. *Education*, 97(4), 360–363.
- Manning, M. L., & Bucher, K. T. (2007). *Classroom management: Models, applications, and cases* (2nd ed.). Upper Saddle River: Pearson Education.

- Martin, A. J., Linfoot, K., & Stephenson, J. (1999). How teachers respond to and concerns about misbehavior in their classroom. *Psychology in School*, 36(4), 340–358.
- Merriam, S. B. (2009). *Qualitative research: Guide to design and implementation*. San Francisco, CA: Wiley.
- Smith, C. J. (2001). *School discipline and classroom management: A must for improved*. Retrieved January 10, 2013, from http://waldenpdk.org/newsletter/Smith_SchoolDiscipline.html
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.
- Thompson, A. M., & Webber, K. C. (2010). Realignment student and teacher perceptions of school rules: A behaviour management strategy for students with challenging behaviours. *Children and Schools*, 32(2), 71–80.
- Torff, B., & Sessions, D. N. (2005). Principals' perceptions of the causes of teacher ineffectiveness. *Journal of Educational Psychology*, 97(4), 530–537.
- Vijajindren, A. (2010). Teachers too soft on students? *New Straits Times*. Retrieved from <http://www.nst.com.my/nst/articles/01avschool/Article/#ixzz1DLuP9wYe>
- Walsh, D. (2004). *Why do they act that way? A survival guide to the adolescent brain for you and your teen*. New York: Free Press.
- Wasicsko, M. M., & Ross, S. M. (1994). How to create discipline problems. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 67(5), 248–251.
- Yuan, X., & Che, L. (2012). How to deal with student's misbehavior in the classroom. *Journal of Educational and Developmental Psychology*, 2(1), 143–150.

Chapter 38

A Study on the Interpersonal Behaviours of Trainee Teachers with Their Students During Teaching Practicum

Ahmad Irfan bin Jailani and Marina Mohd Arif

Abstract This study investigated the interpersonal behaviours of 85 trainee teachers from the Faculty of Education, UiTM towards their students during their teaching practicum. Questionnaire on Teacher Interaction (QTI) was used to determine the frequency of the eight identified behaviours exhibited by the respondents. Analysis of the acquired data showed that the trainee teachers from the Faculty of Education, UiTM frequently showed behaviours which indicate understanding, friendliness and leadership qualities. The pattern of all the eight interpersonal behaviours combined indicates that the respondents were tolerant and authoritative towards their students. The analysed data also indicate that the respondents from different programmes have different interpersonal behaviours from one another. From the results of this study, it is suggested that further steps be taken to improve the quality of interpersonal behaviours portrayed by trainee teachers.

Keywords Interpersonal behaviours • Trainee teachers • Teacher education

38.1 Introduction

The relationship that the teacher and students shared has been delicately discussed and researched for the betterment of the society. In some studies, the interpersonal behaviour that the teacher exhibits to his/her students is said to be the focal point of their relationship and this has been said to influence the children's motivation, achievement as well as their interest to participate in a particular subject.

In the case of trainee teachers, before the start of their teaching practicum, each trainee teacher would already have a set of beliefs and theories on how they should approach their students. Trainee teachers are encouraged to build rapport through positive interpersonal behaviour with their students as it yields great benefit to the

A.I. bin Jailani (✉) • M.M. Arif
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: ahmadirfanj@gmail.com; mmohdarif@yahoo.com

students' interest in the subject (den Brok et al. 2005b) and motivation to participate in class (Henderson et al. 1994). According to Rideout (2006), trainee teachers tended to be more or less humanistic in their Pupil Control Ideology. This type of ideology will result in more interaction between the trainee teachers with their students. In addition, Gibson (2006) concluded that students who report receiving more teacher support also report less disruptive behavior that later result in an increase in academic efficacy. These positive findings are also observed from a research by Barile et al. (2012) where it was stated that students who view their relationships with their teachers positively tend to stay in school more rather than dropping out, showcasing the importance for a thoughtful interpersonal relationship between teachers and students. Students are also seen to cooperate more when teachers display positive interpersonal behaviours as highlighted by Scrivner (2009). Thus, looking further into the complex interpersonal behaviours of the trainee teacher towards their students would provide valuable insights for future trainee teachers on the type of relationship that they should strive for.

This study intends to look at the interpersonal behaviours portrayed by 85 trainee teachers during their teaching practicum and it is governed by the following questions:

1. What are the least and most common interpersonal behaviours exhibited by the trainee teachers from the Faculty of Education UiTM during their practicum period?
2. How much proximity was allowed and influence was given by trainee teacher from the Faculty of Education UiTM with their students during their practicum period?
3. How do the interpersonal behaviours developed by the trainee teachers from the different programmes in the Faculty of Education UiTM differ from one another?

38.2 Literature Review

This study examines the interpersonal behaviours of trainee teachers using the eight identified patterns of interpersonal behaviours based from the Leary Model for Interpersonal Teacher Behaviour (MITB) (1957) which are Leadership, Helpful/Friendly, Understanding, Student Responsibility and Freedom, Uncertain, Dissatisfied, Admonishing and Strict behaviour. These behaviours if portrayed by trainee teachers with their students, depending on whether frequently or rarely will have an impact on their relationship.

Wei et al. (2009) indicate that students prefer their teachers to exhibit more positive interpersonal behaviors such as demonstrating leadership behaviours, being friendly and promoting student freedom as much as possible. In their study, lower scores were received for behaviours that have negative connotations for example dissatisfaction, admonishment and strictness. Positive relationship shared between students and their teachers is said to benefit greatly on the students' attitudes towards

the subject. Through the use of the questionnaire on teacher interaction (QTI) based on the Model of Interpersonal Teacher Behaviour (MITB), it has been found that teacher-student interpersonal behaviour correlates with the students' attitude towards the subject taught (den Brok et al. 2005b). In addition, it is also highlighted that the level of influence and proximity provided by teachers has a great influence on moulding positive attitude towards a subject (den Brok et al. 2005b). Moulding a positive relationship based on these two factors leads to better view on the subjects taught by the teacher (den Brok et al. 2005b). It is believed that forging such relationship between teachers and students will result in better understanding of the subject taught as well as a decrease in misbehaviour.

Interpersonal behaviours of teachers also affect students' view of the classroom. "In classes where the students perceived greater leadership, understanding and helping/friendly behaviour in their teachers, there was a more favourable attitude towards the class and laboratory work" (Henderson et al. 1994, pg. 12). This is also confirmed by den Brok et al. (2005a) in which they state that an interpersonal behaviour where the teacher is seen as dominant and cooperative would lead to more efforts given by the students on a subject. On the other hand, teachers who exhibit admonishment, strictness and dissatisfaction in their behaviours are seen as the least ideal teacher (Wei et al. 2009) and teachers who overuse or even abuse their power and authority are seen as less favourable by their students (Koutrouba et al. 2012). It is also predicted that such misuse of power may lead to even more misbehaviour.

38.2.1 Questionnaire on Teacher Interaction (QTI)

In measuring the interpersonal behaviour of the trainee teacher, the study employed the use of Questionnaire on Teacher Interaction (QTI). The questionnaire was constructed by Wubbels et al. (1991) centred on the Model for Interpersonal Teacher Behaviour (MITB) in order to gauge the interpersonal behaviour of the teachers by considering the teachers' behaviours in their relationship with their students. Based on the amount for each of the eight interpersonal behaviours, the amount of proximity and influence exerted by a teacher can be determined as well.

Figure 38.1 shows the different types of behaviours that can be used to address and gauge the interpersonal behaviour of teachers using the QTI. QTI has been used extensively in studies on interpersonal behaviour at various countries like Kashmir (den Brok et al. 2005b), China (Wei et al. 2009), Singapore (Goh and Fraser 1998), and Brunei (den Brok et al. 2005c). The use of QTI is said to benefit students as well as teachers (Fisher et al. 1995). Results from QTI would reveal students' perceptions of their teachers and also their thoughts and beliefs on what is considered as an ideal teacher. Information such as this is very useful and can be reviewed by trainee teachers who have no previous experience in teaching. Because the QTI can also be administered to teachers, they would learn of their own interpretation of what a good and bad teacher is and determine whether they are close or still far from that desired idea.

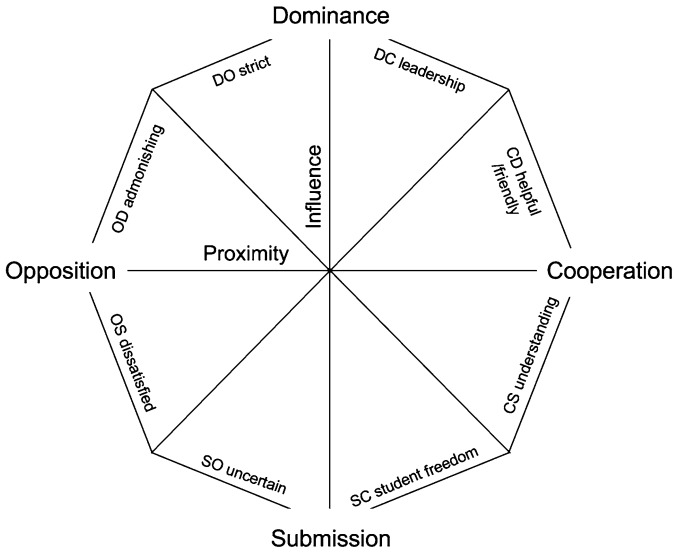


Fig. 38.1 Leary model for interpersonal behaviour (Source: Wubbels and Levy (1993))

38.3 Methodology

38.3.1 Research Design

This study employs a quantitative design where the aforementioned Questionnaire on Teacher Interaction (QTI) was used as the main instrument to collect data for the study. QTI was administered to the trainee teachers to identify and provide a scale to the different types of interpersonal behaviour exhibited between them and their students. The questionnaire measures the interpersonal behaviour of the trainee teacher by determining how frequently they were portrayed. There are eight identified interpersonal behaviours based on the Leary model which are leadership, helpful/friendly, understanding, students' responsibility and freedom, uncertainty, dissatisfaction, admonishment and strict behaviour. The QTI consists of 48 short statements on the kind of relationship the trainee teachers had with their students, and answered by using a 5-point Likert scales. Each statement represents a specific interpersonal behaviour and the samples were required to determine how frequent they portrayed it to their students with one end of the scale representing never and the other representing always. The degree of which a behaviour was practiced is determined from the sum on the Likert scale of all six items representing it.

The collected data of all eight characteristics would then be mapped on the Leary model to reveal the pattern and the amount for proximity and influence given by the trainee teacher. The acquired data then were used to compare the interpersonal behaviours of trainee teachers among the different programmes. This was made possible by comparing the mean average of each programme on the eight different types of interpersonal behaviour.

38.3.2 Respondents

This study employed purposive sampling method whereby the researcher selected the samples based on the specific needs of the study. The number of respondents selected for this study was 85, almost half of the total number of population.

Eighty-five trainee teachers were selected as the samples of the study. From these 85 trainee teachers, 43 were from the TESL programme, 7 were from Arts Education programme, 7 were from Physical Education Programme, 9 were from Science Education Programme and 24 were from Mathematics Education Programme.

38.4 Findings and Discussions

38.4.1 Level of Interpersonal Behaviours

The scores were calculated according to the respective type of behaviour (Leadership, Helpful/Friendly, Understanding, Student Responsibility and Freedom, Uncertainty, Dissatisfaction, Admonishment and Strictness) represented by six items in the questionnaire. The sum of all six items was calculated across all samples to identify the mean average that represents the levels of different behaviours from the trainee teachers. They were converted to percentage and categorized according to how frequent they were practiced with 1–20 % being very rare, 20–40 % rare, 40–60 % sometimes, 60–80 % common, and 80–100 % very common.

All of the interpersonal behaviours of the respondents are summarized in Fig. 38.2.

The bar chart in Fig. 38.2 shows that the commonly practiced behaviours were those that indicate understanding and friendliness towards the students. Leadership behaviours were also common among the respondents. Behaviours that promote students' responsibility and freedom were sometimes exhibited by the trainee teachers during their practicum. Similarly, behaviours that indicate strictness were also sometimes shown by the respondents. Admonishing, uncertainty, and dissatisfied behaviours were rarely observed among the respondents.

38.4.2 Level of Proximity and Influence

In order to look at the level of proximity and influence shown by the trainee teachers to their students during practicum, the data collected from the first research question were cross referenced with the Wubbels and Levy (1993) model for interpersonal teacher behaviour. Figure 38.3 is a visual representation of the amount of influence and proximity given by the respondents during their practicum.

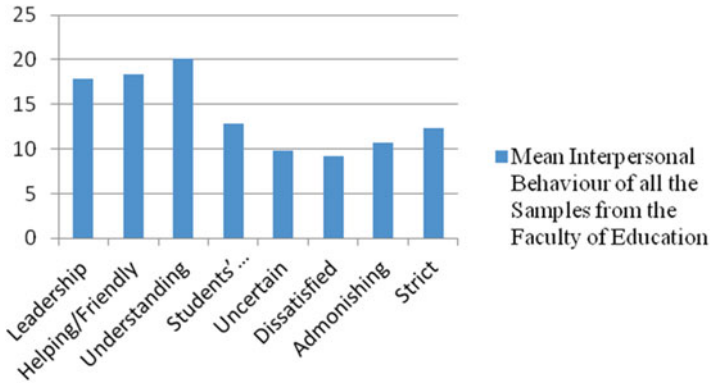


Fig. 38.2 Mean interpersonal behaviour of all the trainee teachers

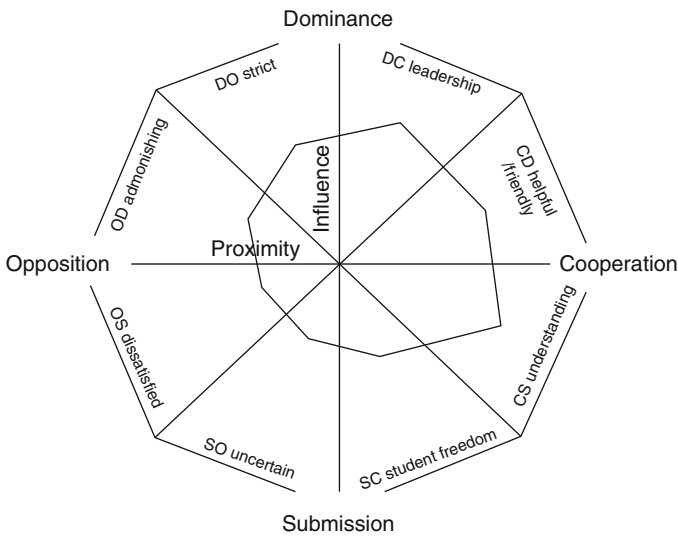


Fig. 38.3 Visual representation of the amount of proximity and influence exerted by the trainee teachers

Leadership	17.90
Helping/friendly	18.31
Understanding	20.18
Students' responsibility and freedom	12.90
Uncertain	9.82
Dissatisfied	9.17
Admonishing	10.69
Strict	12.28

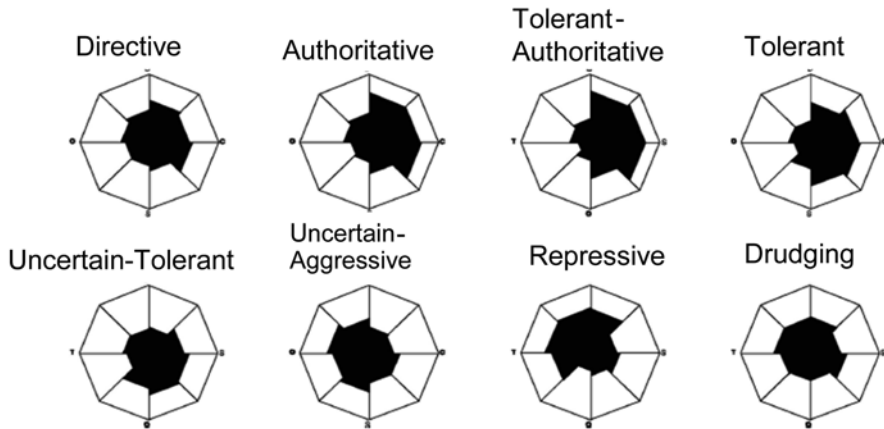


Fig. 38.4 A representation of the eight types of pattern of interpersonal relationships

Figure 38.3 shows that the four types of behaviour that stand for cooperation is 69.29/120 compared to those that represent opposition which is 41.96/120. Therefore, the trainee teachers in this study were more cooperative than distant to their students during practicum.

For the amount of influence given by the trainee teachers to their students, being dominant is recorded at 59.18/120 and being submissive is identified at 52.07/120. Although dominance is higher than submissive, the amount is negligible enough to indicate that the influence the trainee teachers had on their students is neither high nor low. In summary, the respondents had an equal influence to the students whereby they were not too dominant or submissive to their students' needs.

By comparing the findings in Fig. 38.3 to the graphic representation of the eight types of pattern of interpersonal relationships in Fig. 38.4, it can be concluded that the trainee teachers from the Faculty of Education UiTM is closest to the model that indicates Tolerant Authoritative behaviour.

38.4.3 *Level of Interpersonal Behaviours Practiced According to Programmes*

After identifying the interpersonal behaviours of all the samples as a whole unit of trainee teachers from the Faculty of Education UiTM, the next step is to identify whether trainee teachers from different programmes behave differently from one another with their students. By labelling each programme from the Faculty of Education UiTM as independent variable and the eight different types of interpersonal behaviour as dependent variable, the mean average according to the different programmes was identified.

Table 38.1 Mean Average of Interpersonal behaviours of samples according to programmes

Programme	Lea	Und	Unc	Adm	HFrQ	SReQ	Dis	Str
TESL	17.55	19.50	9.89	10.74	18.36	12.08	8.53	12.00
Mathematics	17.62	19.54	9.54	9.21	18.47	12.72	9.31	12.27
Sciences	18.66	20.56	10.35	9.55	18.34	12.55	10.00	11.66
Arts	18.00	18.28	10.14	12.72	16.71	10.71	10.29	12.56
Physical education	19.29	21.72	9.15	11.85	19.00	11.86	10.99	14.43

Table 38.1, it shows that Physical Education trainee teachers portrayed the most leader-like and understanding behaviours with their students. The data also confirms that they were helpful and friendly, however at the same time, they were not afraid to be strict and to show dissatisfaction in their approach. For interpersonal behaviours that indicate admonishment, it is most frequently practiced by trainee teachers from the Arts Education programme. Trainee teachers from Mathematics Education programme on the other hand were identified to entrust their students with the most responsibility and freedom.

38.5 Discussion

The analyzed data suggest that the trainee teachers from the Faculty of Education UiTM were friendly and understanding to their students. This is expected due to the respondents' position as trainee teachers. Rideout (2006) states that beginner trainee teachers are more flexible in their approach to their students. It is important for the trainee teachers to practice friendly and understanding behaviours because it is positively related to the students' achievement (Scrivner 2009). Hence, this suggests that the respondents were right in practicing these behaviours frequently. Furthermore, these behaviours could have also been reinforced because of the lack of experience that the trainee teachers have.

However, data from the study also show that behaviours indicating leadership were also commonly practiced by the trainee teachers. The high score received for leadership seems to indicate that the respondents knew how to balance their approach between being friendly and being a leader to the students. Data from the study also indicate that behaving strictly was sometimes displayed by the respondents towards their students. Negative related behaviours like admonishment, uncertainty and dissatisfaction were all recorded as rarely occurring behaviours among the trainee teachers. This is a good indication since such behaviours are known to encourage misbehaviours from the students.

The trainee teachers in this study were also seen as showing positive degree of proximity towards their students as they tend to be more cooperative rather than uncooperative with their students. This is an indication that the respondents were cooperative and submissive in the nature of their relationship according to the Leary model of Interpersonal Behaviour. However, this contradicts the finding where the

respondents also scored well on leadership behaviour. Hence, after comparing with the eight types of pattern of interpersonal relationships (Rickards et al. 2005), it can be concluded that the trainee teachers from the Faculty of Education UiTM practiced tolerant authoritative behaviours.

The trainee teachers from the Faculty of Education UiTM were also found to be friendly and understanding but did not provide enough freedom and responsibility for the students and opted to be the sole person in charge, the leader. This could be an indicator that trainee teachers were afraid that they would lose control of their students or appear weak once they provide them with freedom for them to explore. Being a good leader is important but it is also important to take note of how students react negatively to excessive control exerted by their teachers (Koutrouba et al. 2012)

Trainee teachers from the Physical Education programme scored the highest for leadership, understanding, friendly, strict and dissatisfied behaviours. This may be due to the fact that almost all of the respondents except for one from the Physical Education programme were males. This is supported by Petegem et al. 2005 where findings from his study indicated that male teachers with no job security tend to be more dominant by scoring high in the domain of leadership and friendly and understanding behaviours. This is similar to the male Physical Education programme respondents because as trainee teachers, the job is only considered as training and temporary hence no actual job security.

The data analyzed also indicate that respondents from the Science Education programme were the most uncertain in their behaviours. Being uncertain is an indication of lack of practice or nervousness which may be perceived as a weakness from the students. Hence, steps need to be taken to reduce such behaviours from Science Education trainee teachers as these behaviours may affect the trainee teachers' quality of teaching.

Art Education trainee teachers on the other hand were seen to be the most admonishing in their behaviour with their students. Such behaviours should be reduced in the interpersonal relationship between teachers and students because of its negative correlation to the students' achievement and enjoyment of the lesson (Wei et al. 2009).

Behaviours that indicate responsibility and freedom were mostly seen from trainee teachers from the Mathematics Education programme. Quek et al. (2007) suggested that promoting responsibility and freedom has no effect on students' enjoyment of the projects in the lesson. It should also be noted that Wei et al. (2009) state that in order to provide freedom, the teacher must also sometimes be strict in his or her behaviours.

38.6 Conclusion

The findings from this study suggest that the trainee teachers from the Faculty of Education UiTM were tolerant and authoritative in their pattern of behaviour. Nevertheless, there is still a need for trainee teachers to try and develop more on all

eight aspects of the interpersonal behaviour as having the optimal amount exhibited for each behaviour would mean better results and outcomes to the teaching and learning experience. A focus or a course on how trainee teachers should act around students could be the key in producing valuable workforce and teachers in the future.

References

- Barile, J. P., Donohue, D. K., Anthony, E. R., Baker, A. M., Weaver, S. R., & Henrich, C. C. (2012). Teacher-student relationship climate and school outcomes: Implications for educational policy initiatives. *J Youth Adolescence, 41*, 256–267.
- den Brok, P., Levy, J., Brekelmans, M., & Wubbels, T. (2005a). The effect of teacher interpersonal behaviour on students' subject-specific motivation. *The Journal of Classroom Interaction, 40*(2), 20–33.
- den Brok, P., Fisher, D., & Koul, R. (2005b). The importance of teacher interpersonal behaviour for secondary science students' attitudes in Kashmir, India. *The Journal of Classroom Interaction, 40*(2), 5–19.
- den Brok, P., Fisher, D., & Scott, R. (2005c). The importance of teacher interpersonal behavior for student attitudes in Brunei primary science classes. *International Journal of Science Education, 27*, 765–779.
- Fisher, D. L., Fraser, B. J., & Cresswell, J. (1995). Using the "Questionnaire on Teacher Interaction" in the professional development of teachers. *Australian Journal of Teacher Education, 20*(1), 8–18.
- Gibson, D (2006). *The association of students academic efficacy, achievement, goal orientation, and teacher rapport with disruptive behaviour in the classroom*. Unpublished doctoral dissertation, St. John's University, New York. (UMI no. 3229029)
- Goh, S. C., & Fraser, B. J. (1998). Teacher interpersonal behaviour, classroom environment and student outcomes in primary mathematics in Singapore. *Learning Environments Research, 1*, 199–229.
- Henderson, D. G., Fisher, D. L. & Fraser, B. J. (1994). *Learning environments and student outcomes in senior high school biology classes*. Paper presented at annual meeting of National Association for Research in Science Teaching, Anaheim, CA.
- Koutrouba, K., Baxevanou, E., & Koutroumpas, A. (2012). High school students' perceptions of and attitudes towards teacher power in the classroom. *International Education Studies, 5*(5), 185–198.
- Petegem, K. V., Creemers, B. P. M., Rossel, Y., & Aelterman, A. (2005). Relationships between teacher characteristics, interpersonal teacher behaviour and teacher wellbeing. *The Journal of Classroom Interaction, Winter 2005, 40*(2), 34–43.
- Quek, C. L., Wong, A. F. L., Divaharan, S., Liu, W. C., Peer, J., & Williams, M. D. (2007). Secondary school students' perceptions of teacher– Student interaction and students' attitudes towards project work. *Learning Environments Research, 10*, 177–187.
- Rickards, T., den Brok, P., & Fisher, D. (2005). The Australian science teacher: A typology of teacher–student interpersonal behaviour in Australian science classes. *Learning Environments Research, 8*, 267–287.
- Rideout, G. (2006). *An examination of the predictive power of demographic, experiential and philosophical orientation variable clusters in relation to change and stability of pre-service teachers' pupil control ideology*. Electronic theses and dissertations, Paper 1040. <http://scholar.uwindsor.ca/etd/1040>
- Scrivner, C. M. (2009). *The relationship between student achievement and teacher attitude: A correlational study*. Unpublished doctoral dissertation, Northcentral University, Arizona (UMI 3351416)

- Wei, M., den Brok, P., & Zhou, Y. (2009). Teacher interpersonal behaviour and student achievement in English as a Foreign Language classrooms in China. *Learning Environments Research*, 12, 157–174.
- Wubbels, T., & Levy, J. (1993). *Do you know what you look like? Interpersonal relationships in education* (pp. 103–112). London: Falmer.
- Wubbels, T., Brekelmans, M., & Hooymayers, H. (1991). Interpersonal teacher behavior in the classroom. In B. J. Fraser & H. J. Walberg (Eds.), *Educational environments: Evaluation, antecedents and consequences* (pp. 141–160). Oxford: Pergamon Press.

Chapter 39

Enhancing E-Learning Using Smart Mobile English Learning Tool (SMELT)

Nnaekwe Uchenna Kingsley, Norlia Mustaffa, Pantea Keikhosrokiani,
and Keyvan Azimi

Abstract With the recent advancement in the technological world and the adult learners' growing desire to have flexibility with their learning tool, such that it allows them to learn even while on the move and while they play games, hence the need for mobile devices that enhances teaching and learning in a virtual classroom environment. Mobile devices can be used in both online setting and in the brick-and-mortar (traditional setting). Different people are able to learn in different ways. People tend to learn better, when they are made to discover learning themselves. In line with this, a design of a mobile app known as Smart Mobile English Learning Tool (SMELT) for adult learners is presented here. This application is intended to help second language speakers to improve their English communication ability. It will also be useful for adults looking for job placements or moving up the corporate ladder in their workplaces. In order to develop SMELT, we have conducted a preliminary study and illustrated the results in this paper. The preliminary study enable us to determine the need of such a learning tool that will aid learners improve their English, even while on the move. Based on these results, a conceptual model on the proposed SMELT application to enhance E-Education is described here. The proposed application hopefully can improve the efficiency, robustness, and reliability of E-Education for the adult learners to improve their English communication ability.

Keywords Mobile device • Location-based services • Mobile learning (M-learning) • E-learning

N.U. Kingsley • N. Mustaffa • P. Keikhosrokiani (✉)
School of Computer Sciences, Universiti Sains Malaysia,
11800 Gelugor, Pulau Pinang, Malaysia
e-mail: kingaguobu@gmail.com; norlia@cs.usm.my; pantea.kia@gmail.com

K. Azimi
School of Electrical Engineering, Universiti Sains Malaysia,
11800 Gelugor, Pulau Pinang, Malaysia
e-mail: keyvan.azimi.64@gmail.com

39.1 Introduction

Since its conception, mobile learning has been directly tied to online education as the platform for both types of education is rooted in the ability to learn beyond the confines of a classroom. As the world continues to change and evolve rapidly, Malaysia should not be left behind. English is the international language, both in reality and cyber world, the language of the cinema, TV, pop music and even the computer, as such it should be embraced by all. The English subject is one of the compulsory subjects in the Malaysian education syllabus, however many still face difficulty in learning and using the language for various reasons, ranging from low usage to being shy when asked to speak the language in public. Thus we aim to design a mobile app known as Smart Mobile English Learning Tool (SMELT) for adult learners. This application when fully developed will help non native or English as a second language speakers improve their English communication ability. It will also be useful for adults looking for job placements or moving up the corporate ladder in their workplaces by improving their communication. The who will be able to access the English learning modules. There are three levels of learner modules i.e. the beginner, the intermediate and the advanced learner module. Each of these modules is further broken down into bundles for easy understanding.

SMELT is a mobile English learning application that will be developed using the Android operating system as well as Java programming software.

In order to develop SMELT, we have conducted a preliminary study and the results are illustrated in Sect. 39.4. The preliminary study enable us to determine the need of such a learning tool that will assist the learners to improve their English, even while on the move. Consequently, we will describe how the proposed SMELT will enhance E-Education in order to improve user's English ability.

This paper is organized in the following way: first section is on introduction about the proposed SMELT tool; the need of mobile device in e-learning as well as the necessity of m-learning are described in section two and three respectively. Section four will discuss on the preliminary study that have been conducted in order to determine the need of such learning tool that will aid learners improve their English. Section five and six described the details of the proposed SMELT tool as well as the application development methodology. The description of the application is laid out in section seven followed by the conclusion of the paper in section eight.

39.2 Mobile Device and E-Learning

According to Wickremaratne et al. (2008), online learning encourages users to have more of a control over themselves with the lessons to be learnt. However, in designing materials for online learning one has to find one's own way to suit the goals of both the teacher and the program, the needs of the students and the technology available (Wickremaratne et al. 2008).

With the recent advancement in the technological world and the adult learners' growing desire to have flexibility with their learning tool, such that the tool allows them to learn even while on the move and while they play games, hence there is a need for mobile devices that enhances teaching and learning in a virtual classroom environment. Mobile devices can be used in both online setting and in the brick-and-mortar (traditional setting). For mobile devices to be effective in basic delivery and technical support, the following is required:

- WiFi that enables instructors and learners access contents through the use of the internet.
- 3GP for compression and the delivery of mobile based audiovisuals.
- Cloud computing that enhances file sharing and storage.
- GPRS mobile data service, supports high speed connection and data transfer rate.
- Mobile web and mobile apps for dominant content formats for smart phones.

A mobile learning tool to enhance the e-learning should be smart, easy to use, and user-centered. Considering the current challenges faced by adult learners, in their daily life, as they seek better job opportunities, engage in international business collaboration, pass driving test and seek English qualification to study abroad, we intend to develop a mobile application called SMELT. This tool will be a flexible and user friendly tool to address some of the challenges facing adult learners. In order to develop SMELT, a preliminary survey on the need for the product was conducted beforehand. The results of this survey together with reviews on similar work, help us in designing a conceptual framework for the development of this application. We hope this tool will take care of the users' learning needs, even while on a train, bus, work place and just at anywhere and anytime.

39.3 The Need of M-Learning

Many study points to the need for a learner-centered systems to improve teaching and learning and the findings of these studies indicate that when learners take control of their learning instructions, the learning exercise becomes easier and enjoyable for such learners. The need for learners to discover learning themselves and develop language skills independently through the use of hand held devices cannot be over emphasized. Neo (2003) identified this fact and argued that because learning a second language could be frightful, there is the need for a learner-centered learning activity whereby learning shifts from the conventional teacher-centered system in which knowledge of the language skills are transmitted by the teacher in class alone, to one that allows for learner to discover learning themselves and develop language skills independently through the use of hand held devices. The variety of platforms allow learners to learn using the best multimedia that suits their own learning styles and taste. Motivating learning in an online learning environment has been identified as an impediment to the successes of the system, as learners feel

bored and isolated while learning online. The use of mobile application for learning a new language, makes learning more exciting, as the boredom and isolation of learners in an online environment, tends to be eliminated, or reduced, as the mobile system will make the learning exercise, a fun-filled experience for the learners (Neo 2003).

39.4 Preliminary Study on the Need of Smelt

The preliminary study was conducted through online method and the target population is the respondents who are willing to participate in the study. The total number of respondents that have participated in this study is 51 whose age ranging between 21 and 55 years old.

The findings from the preliminary study have fulfilled the objectives that have been set for this study:

- The result of the findings indicates that there is a need for this learning tool.
- Respondents need tools (English Language Learning Tool) to improve their English based on the levels of learning progress.
- The services that need to be included in SMELT are determined from this study
- The findings serve as a basis for proposed conceptual framework of SMELT

39.5 Proposed Smart Mobile English Learning (SMELT) Tool

Many researchers argue that the growth of pervasive, ubiquitous, computing will have a large impact on learning (Patten et al. 2006). Suitable devices for mobile learning include digital media players, smart phones, and personal digital assistants or PDAs. Ktoridou and Eteokleous (2005) defined m-learning as e-learning using mobile devices and handheld IT devices, such as PDAs (Personal Digital Assistants), mobile phones, laptops and tablet PCs (Ktoridou and Eteokleous 2005). One of the key benefits of these devices is that they allow learners vary their study location and to study “on the move”. Sandberg et al. (2011) indicate that using a mobile device in a learning context allows a learner to learn at anywhere and at anytime. M-learning with handheld devices eradicated geographical borders, enabling co-operative learning environments which have individual and group interaction (Sandberg et al. 2011).

In view of the foregoing scenario, SMELT is introduced based on the problem statement highlighted earlier (in Sect. 39.3) in order to help learners achieve their aims of seeking alternative ways of improving their English ability, for the purpose of getting job placements, helping their children on homework, and at the same time not being bored or isolated while they learn. Though learning a new language could

be difficult and strange to a second language learner, it can become more difficult if the platform for learning, is equally as difficult as the content itself. SMELT is an easy to use mobile tool, whereby learning the language will be more eventful and enjoyable for the learner. The mobile application will give the learner much more flexibility to how he learns, and with regards to the place and time he chooses to learn. The learner does not need to worry, if there is an internet facility or not as he can learn using already downloaded packs on his mobile phone. With all the portability that a smart phone offers, he/she will always have fun learning, and watching games while playing music on his/her mobile phone. The e-community feature allows users to interact with support staff, and also interact with other users on the platform. The other important benefit of the new system is in its free practice packs for all the three levels of learning as this is aimed at introducing to the learners what to expect in the complete module for each level. It also comes with evaluation test questions and answers for each of the modules where the learners will be expected to try out the evaluation test questions. Once the learners score a grade of 70 % from the evaluation they can be automatically promoted to the next level of learning thus this is a major feature of the system. Once installed on a learner's mobile application like Android supported Smart phones, Ipad, Ipod, etc., the learner can learn with it irrespective of having an access to internet facility or not. Learning can actually take place at anywhere, at anytime of the day.

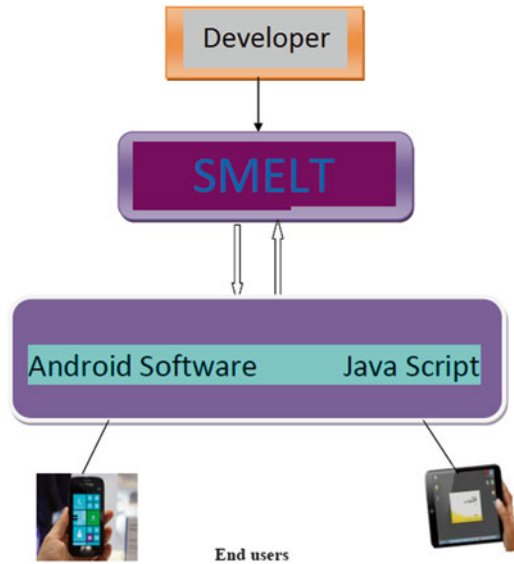
39.5.1 Technology and Product Development

English as a second language (ESL) has continued to play a vital role in our lives in so many ways for example in businesses, workplaces, international friendship, collaboration and as a medium of instruction around the world, hence its importance cannot be over emphasized. Though many still find the language difficult to comprehend, as such, it is imperative that a mobile system could help accelerate the level of understanding of this important language. A more robust environment, coupled with an easy to use tool, will be needed to improve the learning outcome of learners. In designing such a tool, the need of individual learners should be adequately considered first.

Generally, SMELT is a mobile English Learning using the Android operating system as well as Java programming software for the development of the product. Our mobile app will be developed and written in the Java programming language using the Android Software Development Kit (SDK), because of its wider reach and coverage.

The Android Software Development Kit (SDK) includes a comprehensive set of development tools (“Tools Overview”. Android Developers. 21 July 2009). These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, Windows XP or later; for the moment we will develop our application on

Fig. 39.1 Mobile application overview



Android itself by using [AIDE – Android IDE – Java, C++] app and [Android Java editor] app.

Google Play, formerly the Android Market, is a digital distribution platform for applications for the Android operating system and an online electronics and digital media store, operated by Google. This service allows intending users to browse and download our applications developed with the Android SDK (Software Development Kit) and published through Google (“Features”. Google.com. Retrieved 1 May 2012). SMELT application will be made available through the Google Play store. All users need is to create gmail account on their Android applications and download the SMELT application on the Android Google play store. Afterwards users can choose the learning package they are interested in, and follow up with the practice questions and then the test questions. After the introductory part of the package, learners will have option of extension of access to each learning pack, starting with the beginner to the intermediate and advanced level as it suits each individual learner.

After successfully passing the test questions in the chosen pack by scoring a predefined score, the system is capable of promoting the learner automatically to the next level of learning based on the users’ performances on the test exercise.

39.5.2 Overview of System Module

Figure 39.1 illustrates the overview of the mobile application module for SMELT. Basically, the main service rendered by SMELT is the learning of the English language via the use of mobile learning tool. The tool makes it easier for

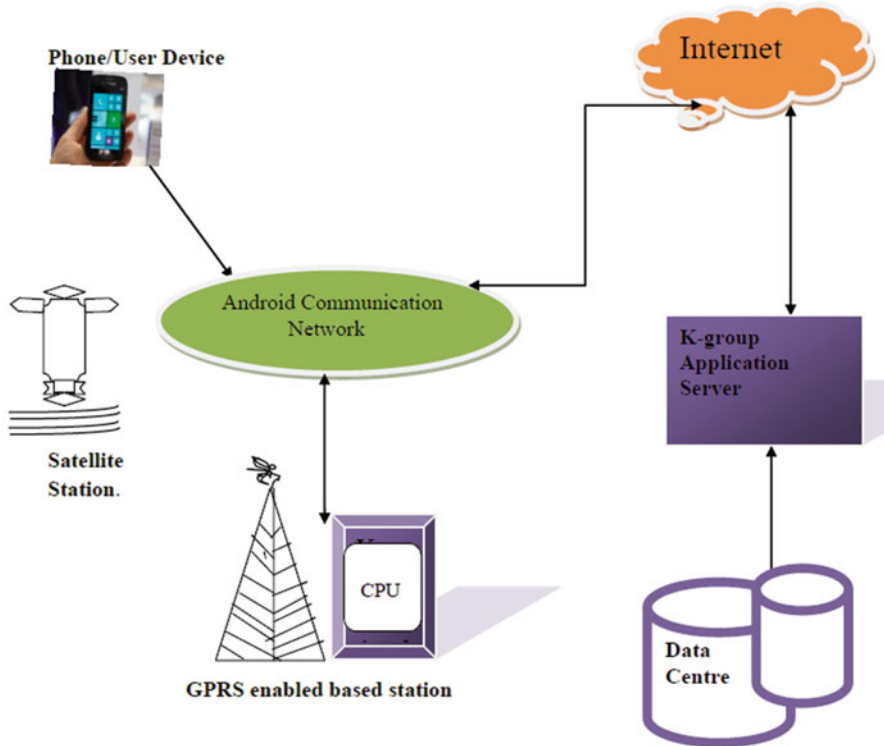


Fig. 39.2 SMELT’s system architecture

adult learners who wish to improve their English ability. Our target is any adult that wished to improve their English ability for reasons ranging from seeking job placements to passing professional exams. All the learner need to do is just download our free learning app from the Google Play store and choose the level of learning they wish to enroll in and the practice class, as well as the evaluation session begins.

39.5.3 Proposed System Architecture

Figure 39.2 shows the proposed system architecture for SMELT. The components are made up of communication network, in this case Android, which need to be logged in via the internet facility by the users of this application. Once a user is logged and downloads this app into their mobile system, data about them are generated from the server and stored in our database. Information about the user is tracked using the GPRS system, which allows the user to carry out transactions using our app, wherever they might be, all day.

The system's ease to use feature allows users unhindered access to the learning materials at anytime and anywhere. Information about downloads are generated via the Android Network and stored in the database as well.

39.6 Product Development Methodology

After the initial survey that has been conducted on the need for having SMELT, a prototype of the application that we wish to develop is accomplished and is shown to its potential users by demonstrating to them how the new system will work and the benefits of using such a system. Inputs received from potential users, and their requirements, will help in the final prototype design of the application. The continuous system upgrade will be done to meet the needs and requirements of intended users of the application. But before this prototype was developed, a lot of steps were embarked upon so as to give the users the best product available.

Prototyping is an iterative (repeatedly) approach where the process of building an experimental system quickly and inexpensively for easy demonstration and evaluation is conducted iteratively. Prototyping is normally used as a template for the eventual system that will be produced. We have adopted prototyping as the application development methodology because it is less expensive and it is easy to use and it allows developers the opportunity to continue its system upgrade till the "finish line", which is when the finished product is achieved, this approved prototype will serve as a template for the final system. The process of developing a prototype can be broken down into four steps as listed below:

- Step 1. Identify basic requirements
- Step 2. Develop a working prototype
- Step 3. Use the prototype, but if user not satisfied then
- Step 4. Revise and enhance prototype

Figure 39.3 below illustrates the four main steps for system development approach using the prototyping methodology. In explaining these steps, we first, define what a prototype is. A prototype is a preliminary working version of an information system for demonstration and evaluation purposes. The process of building the system will be repeated over and over again until the operational prototype is built.

Step 1 Identifying basic requirement; Establishing a basic requirement before embarking on developing such a system is a sure way of avoiding a system failure in the future and high cost of developing the system. Identifying what is needed, by who, when, where and how, and also been able to define the aim of the new system, which is to develop a learner-centered, Mobile based learning tool for English language learning.

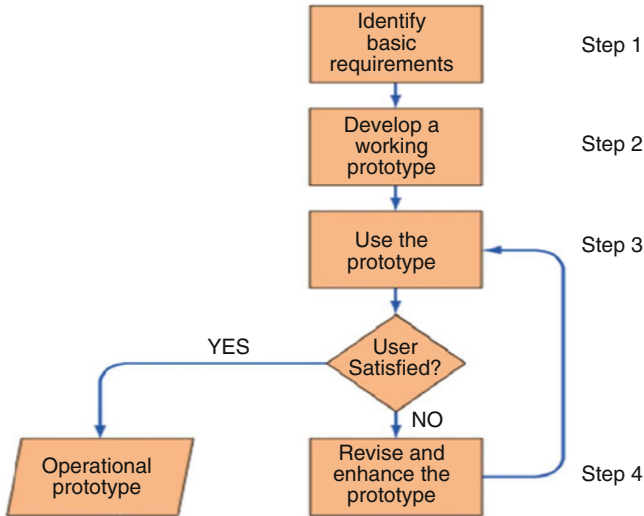


Fig. 39.3 Prototyping methodology

By identifying users' own basic needs, this will help the researcher and IT designer in gathering useful requirements, and in turn makes the end user feel more involved in the application development. As such the users are more committed and satisfied with the application after the final adoption.

Step 2 Develop a working prototype; This will enable cost saving in the application development and developing such a template within a reasonable time frame. Having a working prototype gives all stakeholders a virtual picture of what is being expected from the finished product.

Step 3 Use the prototype; After showing the proposed prototype to the potential users, they can try it out in order to see if it meets their learning needs or not. And with their approval, this will be used as a benchmark for its proposed application. The benchmark will be used in producing the final application. It is hoped that users will patronize this application and use them as well, if after usage the users are satisfied with the application then the prototype will be adopted as the final copy of the application. Hence the prototype will become the final copy in operation, but in case the product is rejected then we will embark on a system upgrade and/or revision. This will lead us to the next step.

Step 4 Revise and enhance the prototype: This is the outcome of the rejection of the initial prototype by end user. This can occur if the users are not comfortable about the usability of the application, or if they find anything that will hinder the smooth running of the application. We will be obliged to revise and enhance the product for greater efficiency, and whenever all stakeholders agree on the final product, it will be adopted by all as the final application.

39.7 Product Description

39.7.1 *SMELT Mobile Interface*

SMELT will be able to be accessed by all users of Android smartphones and any adult interested in improving their English learning, they have the opportunity to do so through the use of their mobile phones by downloading the application on Google play store. The learning app will be introduced on the home page and users can hit each of the buttons to avail themselves of any of the services. The application has three levels of English learning module, i.e. elementary, intermediate and advanced levels where each learner is expected to choose their level of learning after having experienced with free download of the app on Google play store.

39.7.2 *Relevant Features of the System*

Ability to Learn Offline The system could be accessed by learners, even while offline. The moment the application is downloaded and learning modules are accessible, the need for online is automatically eliminated as the learner will only need to learn from the modules downloaded on the mobile interface. Because we are aware most learners might have difficulty gaining unhindered access to the internet, hence our desire to make the app to be internet free after first download.

Online Placement Test One of the very useful adaptive features of the system is in its ability to assess and determine the appropriate level of learning for each new learner. This is done by administering an 'entrance' exam for new users where if a user scores the predetermined score of 70 % and above on their first attempt on the beginners' pack then the user will be moved automatically to the intermediate level of learning.

Adaptive Feature A very useful feature of this tool is in its adaptive capability. The system is able to allow learners graduate automatically to the next level of learning after scoring a predetermined score of 70 % in its evaluation test question. Whereby a learner fails to attain this grade point after three attempts the systems allows them to be promoted anyway. According to Shute and Towle (2003), other important information that needs mentioning is that every adaptive system should have the following features (Shute and Towle 2003):

Firstly, all activities that are presented to the learner should involve the creation and manipulation of representations. If the learner requires mental models that correspond to the representation, then he should be involved actively in those creations and representations. Secondly, content should be designed with multiple representations as a rule to help learners drive down what they learn. When this is done, it

helps the adaptive engine to provide the student with the single representation that best matches the students' aptitude profile, while also giving the engine additional representations (text vs graphics, or graphical representation of some concepts), and also different styles of conceptual explanation. Thirdly, the learner should be provided with a final learning activity which encourages reflection and integration of the knowledge learned. Finally such a system should incorporate enough support, that will help the learner in concentrating on learning the content and not the system itself. This will enable the learner channels most of his cognitive efforts into learning the material and not the system.

Below are some of the screenshots of SMELT which is designed specifically to meet the needs of twenty-first century learners who are desirous to improve their written and spoken English, anywhere and at any time. The screenshots are not the final version of SMELT but they are an overview of the expected final product.

User Rating Users could rate the services rendered by the developer as this feedback will form part of the ongoing upgrading activity of the application.

39.7.3 Explanation of Learning Levels in SMELT

The contents of SMELT are basically made up of three different learning levels, the first is the Beginner/Elementary Level. The major contents of this level are the introductory parts of the language, evaluation questions that make up this bundle are the grammar; simple present, present continuous, simple past, going to, can, can't, could, nouns, I'd like etc. The second bundle is the Intermediate Level where this resembles like the mid-point between the beginner level and the advanced level, the practice and evaluation questions here are drawn from such areas like sentence building with possibility (must, can't, maybe, will), past (should have, might have, could), uncountable nouns, adjectives, adverbs, articles with countable and uncountable nouns. The the next level is the Advanced Level stage, here the learner has matured in his ability to use the language effectively, as such future sentence building will be practiced with simple past, past continuous, past perfect continuous, used to, future continuous, future perfect continuous, present perfect continuous, conditionals, used to etc.

Home Page A well structured home page of an online application helps to serve as a leeway to know the needs and behavior of customers. Keywords that appeal to both users and search engines are sure ways of increasing traffic accessing the application online. Figure 39.4 depicts the home page of SMELT.

The screenshots illustrated in Fig. 39.5 shows SMELT's practice levels for elementary, intermediate and advance learner categories. Learners are expected to choose a level that suits their learning needs and will be able to access to these learning materials.

Fig. 39.4 Home page of SMELT



Fig. 39.5 SMELT's pack of three levels of learning

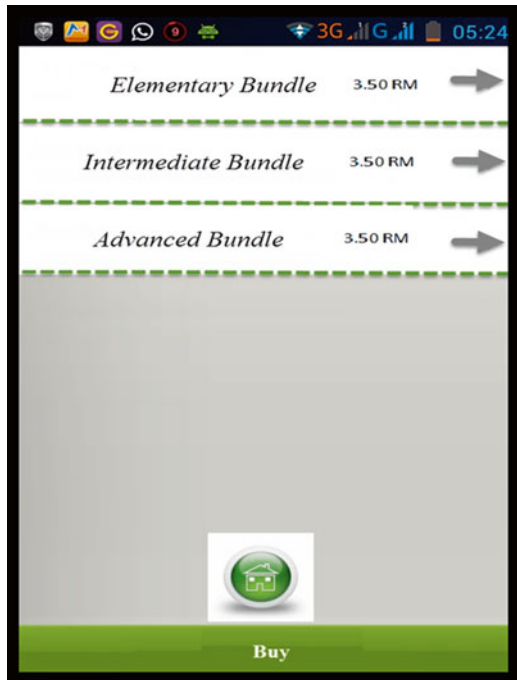


Fig. 39.6 SMELT's sample of evaluation test pack for three levels of learning



Screenshots of Evaluation Test Pack for Three Levels of Learning Figure 39.6 presents the screenshot of SMELT's score of evaluation test questions that have been attempted for every level of learning.

Screenshots of Elementary/Beginners' Pack Figure 39.7 illustrates a screenshot of SMELT beginners' pack. All users need to do is click on this pack to answer practice questions on the elementary pack. This pack also contains audio/video questions that learners are expected to answer after listening to a conversation or an audio sound.

Results from Evaluation Test Figure 39.8 shows the screenshots that show the evaluation score for elementary learners. The learner has an opportunity to try out two more time before the learner can move to the next level of learning.

Intermediate Learner Pack Learners have the opportunity of learning with the visual aids, in this case a picture. They need to fill in the correct answer to complete the sentence in the past perfect as shown in Fig. 39.9.

39.8 Implementation and Recommendation

Software Development Life Cycle (SDLC) gives the platform for software analyst, designers, and engineers to develop the software in a well defined phase that starts from requirement gathering till its deployment phase. These phases are linked

Fig. 39.7 SMELT's sample of elementary/ beginners' pack

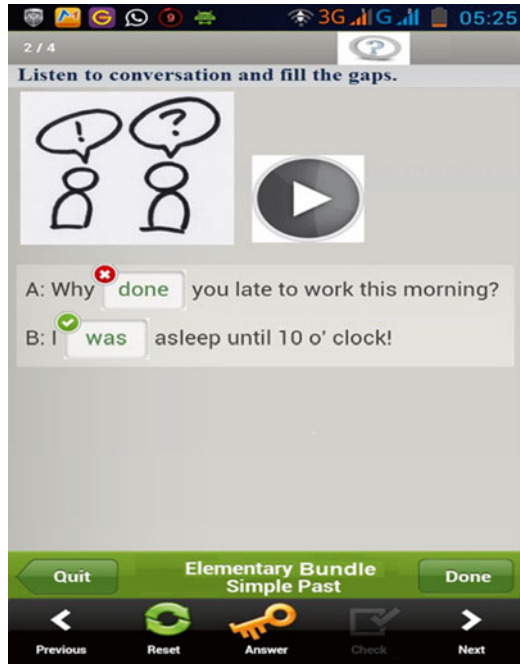
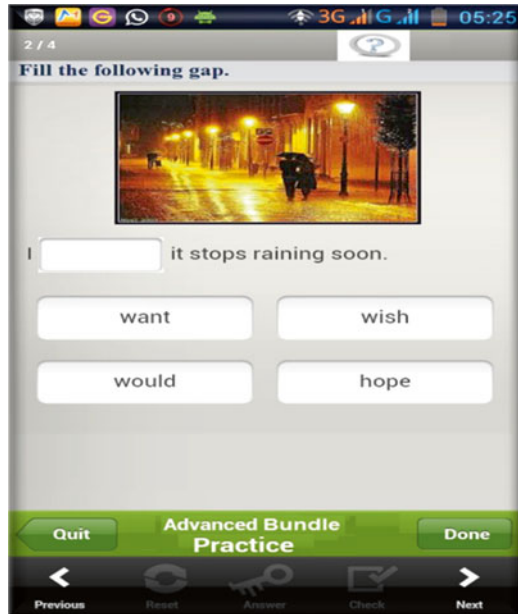


Fig. 39.8 Screenshot of sample evaluation test results



Fig. 39.9 Screenshot of sample intermediate pack



together to form a chain or cycle that never ends throughout the life cycle of the software evolution. Through these phases the software evolution goes through requirement gathering, software product design and documentation with design patterns, implementation and importantly testing before the prototype is ready to be deployed (Easton 1980).

Depending upon the complexity of SDLC methodology, SDLC have many models such as incremental, spiral, waterfall, agile and prototyping etc. We have selected incremental model for our research project that suits requirement and type of software. Incremental model starts from the requirement gathering phase, proceed with design of the software and then move towards the implementation and testing phase. On each phase of the model, it gets incremented following the incremental model as shown in Fig. 39.10.

When one phase gets completed then the process is incremented to the next phase where the iteration is based on the phases like inception (project scope), elaboration (design and architecture), construction (fills in the building blocks) and transition (operation and deployment). Architects and analysts work on iteration ahead of developers and testers to keep their work-product backlog full.

In our initial stage project life cycle, we will use Java platform for the application middleware between the server database management architecture and the mobile client. The database management system will be mySQL which is free and open source and can handle well more than thousand users simultaneously.

Software testing following the quality of assurance criteria is one of the crucial phases of project development in which the software attributes and functionalities

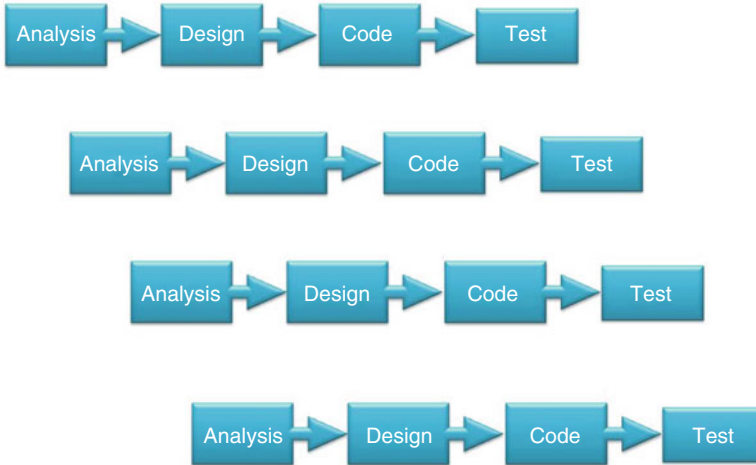


Fig. 39.10 Software increment model for SMELT

are compared with the software requirement specifications and then tested in a simulated real time environment. The application developers do white box testing where they debug the code and then verify the data values in variables and importantly test the application based on the API testing, code coverage, fault injection methods, mutation testing methods etc. On later stage, the software is retested by quality assurance engineer using black box testing method where on real time scenario they produce bugs of different severity with methods includes equivalence partitioning, boundary value analysis, all-pairs testing, traceability matrix and importantly specification-based testing.

39.9 Conclusion

Adult learners have different learning styles that differ from that of young learners. This group of learners requires flexibility, and always likes to be in control of their learning process. In view of this fact, a tool for English learning called SMELT on the mobile platform for adult learners who owned smartphones is proposed here. SMELT when launched eventually, it will help the working class, foreigners, housewives, and non-native speakers improve their English ability at the comfort of their homes. Based on the responses and findings from the preliminary study, it is clear that there is a need for this application for the potential users. A research on the conceptual framework on SMELT in order to assist the design and development of this application also has been conducted. The model is adapted based on framework by (Huanglingzi et al. 2008), due to its completeness in addressing the basic factors that need to be considered in developing a mobile application. SMELT is feasible to

be used by potential users based on the preliminary study that had been conducted and research on the proposed conceptual framework which will assist in the design of the prototype for SMELT in the future.

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References

- Easton, M. (1980). Batch throughput efficiency of ADCCP/HDLC/SDLC selective reject protocols. *Communications, IEEE Transactions on*, 28(2), 187–195.
- Huanglingzi, L., Ronghuai, H., Salomaa, J., & Ding, M. (2008, March 23–26). *An activity-oriented design framework for mobile learning experience*. Paper presented at the Wireless, Mobile, and Ubiquitous Technology in Education, 2008. WMUTE 2008. Fifth IEEE International Conference on.
- Ktoridou, D., & Etekleous, N. (2005). Adaptive m-learning: Technological and pedagogical aspects to be considered in Cyprus tertiary education. *Recent Research Developments in Learning Technologies*, 676–683.
- Neo, M. (2003). Developing a collaborative learning environment using a web-based design. *Journal of Computer Assisted Learning*, 19, 462–473.
- Patten, B., Arnedillo Sánchez, I., & Tangney, B. (2006). Designing collaborative, constructionist and contextual applications for handheld devices. *Computers & Education*, 46(3), 294–308.
- Sandberg, J., Maris, M., & de Geus, K. (2011). Mobile English learning: An evidence-based study with fifth graders. *Computers & Education*, 57(1), 1334–1347.
- Shute, V., & Towle, B. (2003). Adaptive e-learning. *Educational Psychologist*, 38(2), 105–114.
- Wickremaratne, J., Wimalaratne, G., & Goonetilleke, V. (2008). *A blend of adaptive and digital learning towards language proficiency*. Paper presented at the Information and Automation for Sustainability, 2008. ICIAFS 2008. 4th International Conference on.

Chapter 40

Does One Size Fit All? The Academic Writing Needs of Undergraduates Across Disciplines

Shireena Basree Abdul Rahman and Siti Ruqayyah As-Sadiq Abdul Rahim

Abstract Academic writing is an integral part of tertiary education. Undergraduates are expected to have the necessary linguistic skills to be able to produce writing products that adhere to the different genres, courses and disciplines. This study investigates the academic writing needs of undergraduates from three various disciplines (TESL, Art and Science) of one faculty at a public university. This is the only public university in Malaysia with a language policy where English is the medium of teaching and learning. This study reports the findings of a quantitative data analysis generated from third year undergraduate students (n=196). Data are derived from the needs analysis instrument used to obtain undergraduates' self-rated response to academic writing tasks statements. The findings inform that although all three program disciplines are under the same faculty, their academic writing needs are distinctively different. This study proceeds to discuss the implications of these findings for improved future practice in the area of learning and teaching of academic writing.

Keywords Academic writing • ESL learner • Genre writing • Needs analysis

40.1 Introduction

Studies on the written work of Malaysian ESL learners have found that their writing displayed a lack of vivid or interesting elaboration with frequent language mistakes (Parilah et al. 2011). While there are many students who may understand grammar rules, Giridharan and Robson (2011) found that for these students, they themselves

S.B. Abdul Rahman

Faculty of Education, Asian Centre for Research on University Learning and Teaching,
Universiti Teknologi MARA, Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: shire417@salam.uitm.edu.my

S.R.A.-S. Abdul Rahim (✉)

English Language Unit, General Studies Department, Politeknik Sultan Haji Ahmad Shah,
Semambu, 25350 Kuantan, Pahang Darul Makmur, Malaysia
e-mail: assadiq@polisas.edu.my

are unaware of their own academic writing (AW) ability. Few are able to meet the demands and level expected in academic writing in higher education (Musa et al. 2012). Language proficiency has been identified as one of the reasons for the nation's graduate unemployment (Ismail et al. 2011). The critical state of graduates' language proficiency has required the government to allocate funding for remediating graduates' language proficiency through retraining programs (G. Nair et al. 2012) and employability enhancement programs. This action in itself highlights the state and quality of graduates which universities are producing. While this situation persists to be a concern, many would question where the fault lies; whether is it in the course, the students themselves or the system (N Z Shah 2008). However, few have looked into addressing the core of the problem which is in identifying the needs of ESL students' academic discourse in tertiary education. This study proposes that universities take preventative measures in addressing the core of the problem instead of remediating it. This study seeks to understand students' academic writing (AW) needs with the hope that this information could perhaps offer suggestions to universities on how these academic writing needs can be addressed with appropriate writing support and resources.

40.2 Literature Review

Writing in the higher education requires students to put forth their ideas within a framework of domains or discipline knowledge and engage the reader in academic discourse (Giridharan and Robson 2011). Within the academic communities there are genre differences. Hyland (2008) explains that disciplinary genre variation represents the writer's intention to display familiarity and attempts to anticipate possible negative reaction to their views and establish their claims. By doing this, Hyland (2008) explains that it allows writers to galvanise support, express collegiality, resolve difficulties, and negotiate disagreement through rhetorical choices that ties their text with their disciplines. Hyland (2008) categorizes communities of disciplines to spread between the continuum of 'hard knowledge' sciences and 'softer' humanities as shown in Table 40.1.

The table of continuum of academic knowledge (Hyland (2006) cited in Hyland (2008) visually explains how in practice, different disciplines value different kinds of ideas of what communication entails, how it can be communicated, what readers are likely to know, how they value different kinds of argument and different writing tasks in order to be persuaded. Hyland (2008) argues that while this highlights the variations that exist, it does not mean that students writing needs must be generalized in this way as same genre labels may hide rhetorical patterns; therefore, there is a need to research in our students' target contexts. This has been affirmed by Hillary Nesi and Sheena Gardner (2012) as writing demands in university will vary according to different higher education systems.

Table 40.1 Continuum of academic knowledge (Hyland 2006) cited in Hyland (2008)

Sciences	Social sciences	Humanities
Empirical and objective		Explicitly interpretive
Linear and cumulative growth		Dispersed knowledge
Experimental methods		Discursive argument
Quantitative		Qualitative
More concentrated readership		More varied readership
Highly structured genres		More fluid discourses



40.3 Objectives

As the demand and participation in English-medium higher education increases, so is the expectation for students to have academic literacy skills (Hillary Nesi and Sheena Gardner 2012); hence, an understanding of the academic writing needs of undergraduates in their discipline is integral in enabling the right provision to be given to empower them as writers. Hyland (2008) explains that in the context of writing, needs analyses function to ensure that learning to write is seen both in the context in which it occurs and the contexts in which these skills will be used: it is the means of establishing the 'how' and 'what' of a course. Hyland (2008) highly insisted that students take part in the process of assessing their options; this ensures that the needs analyses support learners in taking active responsibility for their learning. Thus, this study reports the findings of an empirical survey to examine the academic writing needs of third year undergraduate students (n=196). The academic writing needs analysis represents an attempt to understand the academic writing needs of undergraduates in a faculty which has three varying disciplines, TESL, Art and Science.

40.4 Methodology

This study was conducted in one of the largest public university in Malaysia, in terms of size and student enrolment. There are two factors behind the choice of the university selected for this study. First, the university chosen is the only public university in Malaysia that has a language policy where the medium of learning and instruction for all courses are conducted in English. Second, the data from this study is collected from the faculty of education, which is home to seven different programmes and three different disciplines. The number of targeted sample of the respondents were determined using Krejcie and Morgan (1970) and Chua (2012) sample size determination table. The table below shows the number of population of students in the programmes offered by the Faculty of Education, the number of targeted sample of respondents, and the number of returned questionnaires. (Table 40.2).

This study adapted Rosenfeld et al. (2004) Inventory of college level writing and thinking tasks survey instrument for obtaining numerical data. Rosenfeld et al. (2004) developed the 44-item instrument in order to identify the writing tasks important for academic success at the undergraduate and graduate levels across six fields of study. This instrument was modified to reflect the university context where the data was collected. A pilot study was done to ensure reliability and validity. Using the Cronbach's alpha internal consistency reliability method, the instrument was found to have reliability coefficient value of 0.95. This reliability value is strong and shows that all the items in the instrument are reliable. Face validity and content validity checks were done during the pilot study based on feedbacks from three experts and pilot participants. Based on their input, relevance of item, purpose of the questionnaire, wording of instructions were improved on for large-scale data collection

Table 40.2 Programmes offered by the Faculty of Education

Programmes offered by the faculty of education		P	TS	R
1. TESL	B Ed (Hons) Teaching English as a Second Language (ED220)	367	74	72
2. Art	B Ed (Hons) Art & Design Education (ED222)	59	12	17
3. Science	B Ed (Hons) Physical Education & Health Programme (ED226)	130	26	30
	B Ed Science (Hons) Biology (ED227)	79	16	18
	B Ed Science (Hons) Physics (ED228)	47	10	10
	B Ed Science (Hons) Mathematics (ED229)	111	23	42
	B Ed Science (Hons) Chemistry (ED230)	54	11	12
		847	172	201

P population, *TS* 20 % targeted sample of the respondents, *R* returned questionnaires

Table 40.3 Index mean rating

Index mean rating	
High rating	3.0 or higher
Low rating	Below 3.0

necessary for this study. The instrument used in this study has 36 task statements and each task statement reflects an operational definition of an academic writing skill.

Out of 201 returned questionnaires, a total of 196 responded surveys were statistically analysed using SPSS. The findings provide evidence to the specific writing task that students deem to be competent in performing within their discipline. The survey’s results revealed a list of the top most competent and least competent academic writing task. Respondents used a scale ranging from 0 to 5 (*0-I do not need to perform this task, 1-Slightly competent, 2- Moderately competent, 3- Competent, 4- Very competent, 5- Extremely competent*). A mean rating of 3.0 (important) is used as the cut-off point for the within-level comparison by fields of discipline. An overall mean rating of 3.0 or higher is considered as high rating, meanwhile an overall rating below 3.0 is considered as low rating. The following table shows the index mean rating used (Table 40.3).

40.5 Findings and Discussions

40.5.1 *The Needs of the Undergraduates in the TESL Discipline*

The survey results for the TESL discipline revealed that 29 out of 36 task statements (80.5 %) received overall mean rating of 3.0 or higher. The highest ranked task statement with an overall mean rating of 3.6 is to *express personal views regarding topics, situations, or issues*. There are only seven task statements with mean ratings below 3.0, with the lowest mean being 2.8 for the task #15, *Write appropriately for*

a generally well-informed and thoughtful audience (eg. maintain an appropriate tone, provide sufficient context or other information for readers to understand the points being made). The descriptive table shows the results of AW Tasks that (Tables 40.4 and 40.5).

40.5.2 The Needs of Undergraduates in the Art Education Discipline

The survey results for the Art Education discipline revealed that 9 out of 36 task statements (25 %) received overall mean ratings of 3.0 or higher. The highest ranked task statement with an overall mean rating of 3.2 is to *Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations, Use clear, efficient formats (eg. flow charts, bullet points, headings) to organize information and guide the reader (include document design), and 'Work collaboratively to plan and compose text.* There are twenty-seven task statements with mean ratings below 3.0. The lowest overall mean rating is 2.4, which is task #17, *Use analogy, metaphor or comparison to define or explain technical or abstract concepts for a general audience,* and task #21, *Credit sources appropriately (eg. Use attribution, footnotes or endnotes).* During data input for the Art Education discipline, there were a number of respondents who rated several of the task items at a scale of '0', this means, they identified the items as '*I do not need to perform this task*'. It appears that this has no direct effect on the finding results of the average mean ratings of the items, however it is important to note that for one, the Art Education discipline is the only respondent that used the scale of '0', and second, the fact that these few respondents had identified several of the academic writing task as not being useful in their field could point out to something more at large in their academic writing needs for students from the Art Education discipline (Tables 40.6 and 40.7).

40.5.3 The Needs of Undergraduates in the Science Education Discipline

The survey results for the Science Education discipline revealed that only 1 out of 36 task (2.2 %) statements received overall mean ratings of 3.0 or higher. The task statement with the highest overall mean rating is task #1, *Describe observations (eg. of an event, behaviour, place, object, or experiment).* There are thirty-five task statements with mean ratings below 3.0. The task statement with the lowest overall mean rating, 2.4, is task #17, *Use analogy, metaphor or comparison to define or explain technical or abstract concepts for a general audience* (Tables 40.8 and 40.9).

Table 40.4 TESL undergraduate high ranking AW tasks

Task #	Task	Mean ratings	Ranking #
4	Express personal views regarding topics, situations, or issues	3.6	1
35	Work independently to plan and compose text	3.4	2
19	Use clear, efficient formats (eg. flow charts, bullet points, headings) to organize information and guide the reader (include document design)	3.3	3
22	Clarify relationships among main and supporting ideas	3.3	4
24	Organize ideas and information coherently	3.3	5
32	Use grammar and syntax that follow the rules of standard written English, avoiding errors that distract the reader or disrupt meaning	3.3	6
33	Avoid errors in mechanics (eg. Spelling and punctuation)	3.3	7
36	Work collaboratively to plan and compose text	3.3	8
1	Describe observations (eg. of an event, behaviour, place, object, or experiment)	3.2	9
2	Explain how to perform a procedure (eg. For instructional materials or manuals)	3.2	10
13	Classify information according to categories or hierarchies (eg. in outlines or organizational charts)	3.2	11
14	Use the conventions of a particular genre (eg. a report, proposal, poem, or abstract)	3.2	12
20	Integrate quoted and referenced material appropriately into the students' own text	3.2	13
23	Develop a well-focused, well-supported discussion, using relevant reasons and examples	3.2	14
30	Express ideas in original or novel ways to hold the reader's interest	3.2	15
3	Abstract or summarize essential information (eg. From speeches, observations, or texts)	3.1	16
7	Predict consequences or outcomes by analysing information, patterns, processes, or findings	3.1	17
16	Present data and other information in a clear and logical manner, offering explanations that make the material understandable to a particular audience (includes tables and charts as well as text)	3.1	18
17	Use analogy, metaphor or comparison to define or explain technical or abstract concepts for a general audience	3.1	19
21	Credit sources appropriately (eg. Use attribution, footnotes or endnotes)	3.1	20
25	Write clearly, with smooth transitions from one thought to the next	3.1	21
26	Choose words effectively	3.1	22
31	Revise and edit text to improve its clarity, coherence and correctness	3.1	23

(continued)

Table 40.4 (continued)

Task #	Task	Mean ratings	Ranking #
6	Analyse and synthesize information from multiple sources (include comparison and contrast)	3	24
8	Write persuasively by constructing well-reasoned argument to support or refute a position	3	25
27	Write precisely and concisely, avoiding vague or empty phrases.	3	26
28	Write fluently, avoiding plodding or convoluted language	3	27
29	Vary sentence structure to communicate ideas effectively	3	28
34	Use word processing software to plan, create and present text	3	29

Table 40.5 TESL undergraduate low ranking AW tasks

Task #	Task	Mean ratings	Ranking #
9	Explore relationships among complex and possibly conflicting ideas	2.9	30
11	Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations	2.9	31
12	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	2.9	32
18	Use technical, content-specific vocabulary accurately and appropriately for a particular purpose and audience	2.9	33
5	Explain an event or occurrence using such evidence as historical accounts, data, or research findings	2.8	34
10	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	2.8	35
15	Write appropriately for a generally well-informed and thoughtful audience (eg. maintain an appropriate tone, provide sufficient context or other information for readers to understand the points being made)	2.8	36

In order to fully synthesize these findings, it is important to understand the commonalities and differences that these three varying disciplines in the faculty of education deal with. Despite the varying disciplines, students from the faculty of Education are required to take BEL 422/420-Report Writing and BEL 482-Business and Professional Communication, common subjects which are offered by the University's Language academy. Among other common subjects that these three disciplines share are Education code courses which requires them to deal with education related theories and skills. Students from these three disciplines would com-

Table 40.6 Art Education Undergraduate High Ranking AW Tasks

Task #	Task	Mean ratings	Ranking #
11	Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations	3.2	1
19	Use clear, efficient formats (eg. flow charts, bullet points, headings) to organize information and guide the reader (include document design)	3.2	2
36	Work collaboratively to plan and compose text	3.2	3
5	Explain an event or occurrence using such evidence as historical accounts, data, or research findings	3.1	4
12	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	3.1	5
33	Avoid errors in mechanics (eg. Spelling and punctuation)	3.1	6
34	Use word processing software to plan, create and present text	3.1	7
13	Classify information according to categories or hierarchies (eg. in outlines or organizational charts)	3	8
24	Organize ideas and information coherently	3	9

monly share classes for these subjects where much academic writing input is implicitly or explicitly received.

Based on the findings of high ranking AW skills, in comparison to other disciplines TESL students rate themselves rather highly competent in most AW skills compared to Art Education students and most drastically for Science Education students. TESL undergraduates identified themselves as having to produce on average 6 or more papers per semester and they also self-rated 29 out of 36 academic writing tasks as the academic writing task that they are competent in doing. For TESL Students, their self-assessed competency in the area of academic writing may stem from the fact that this is an area that is closely relevant to their field and content of their course. Hence their perception of their competence as writers and their confidence in AW may either stem from their competency or their expected competency.

Findings of low ranking AW skills across the three different disciplines, highlights areas of AW that requires more attention to be improved. Comparatively, it has been found that TESL undergraduates have the least number low ranking AW skills, only 7, compared to Art students, with 27 AW skills. Perhaps the most striking finding was that in comparison to the other two fields of discipline, the Science Education undergraduates identified 35 low ranking AW skills. The findings of this study show that there is a big difference between the AW skills needed for all three fields of study under the Faculty of Education. This reflects the varying nature of writing in the discipline that is required of them to produce.

An interesting point to note is that, Art Education students identified themselves to have more competency in 9 out of 36 academic writing tasks compared to the

Table 40.7 Art education undergraduate low ranking AW tasks

Task #	Task	Mean ratings	Ranking #
7	Predict consequences or outcomes by analysing information, patterns, processes, or findings	2.9	10
9	Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations	2.9	11
23	Develop a well-focused, well-supported discussion, using relevant reasons and examples	2.9	12
25	Write clearly, with smooth transitions from one thought to the next	2.9	13
31	Revise and edit text to improve its clarity, coherence and correctness	2.9	14
35	Work independently to plan and compose text	2.9	15
3	Abstract or summarize essential information (eg. From speeches, observations, or texts)	2.8	16
4	Express personal views regarding topics, situations, or issues	2.8	17
6	Analyse and synthesize information from multiple sources (include comparison and contrast)	2.8	18
8	Write persuasively by constructing well-reasoned argument to support or refute a position	2.8	19
20	Integrate quoted and referenced material appropriately into the students' own text	2.8	20
22	Clarify relationships among main and supporting ideas	2.8	21
27	Write precisely and concisely, avoiding vague or empty phrases.	2.8	22
29	Vary sentence structure to communicate ideas effectively	2.8	23
30	Express ideas in original or novel ways to hold the reader's interest	2.8	24
32	Use grammar and syntax that follow the rules of standard written English, avoiding errors that distract the reader or disrupt meaning	2.8	25
1	Describe observations (eg. of an event, behaviour, place, object, or experiment)	2.6	26
2	Explain how to perform a procedure (eg. For instructional materials or manuals)	2.6	27
10	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	2.6	28
14	Use the conventions of a particular genre (eg. a report, proposal, poem, or abstract)	2.6	29
16	Present data and other information in a clear and logical manner, offering explanations that make the material understandable to a particular audience (includes tables and charts as well as text)	2.6	30
18	Use technical, content-specific vocabulary accurately and appropriately for a particular purpose and audience	2.6	31

(continued)

Table 40.7 (continued)

Task #	Task	Mean ratings	Ranking #
26	Choose words effectively	2.6	32
28	Write fluently, avoiding plodding or convoluted language	2.6	33
15	Write appropriately for a generally well-informed and thoughtful audience (eg. maintain an appropriate tone, provide sufficient context or other information for readers to understand the points being made)	2.5	34
17	Use analogy, metaphor or comparison to define or explain technical or abstract concepts for a general audience	2.4	35
21	Credit sources appropriately (eg. Use attribution, footnotes or endnotes)	2.4	36

Table 40.8 Science education undergraduate high ranking AW tasks

Task #	Task	Mean ratings	Ranking #
1	Describe observations (eg. of an event, behaviour, place, object, or experiment)	3	1

Science Education students who only self-rated 1 out of 36 as their competent academic writing skill, despite the fact that the majority of Science Education students identified themselves to producing 4–5 papers per semester, which is more than the average papers identified to be produced by Art Education students, whom a majority of them have identified to produce only 2–3 papers in a semester. Science Education students’ production of writing is more to technical writing such as lab reports. Art Education students meanwhile deal with more art work production than with academic essays. TESL students on the other hand are required to produce a variety of academic essays.

40.6 Conclusion

Previous studies have shown that understanding the types of skills involved in writing and how such skills are involved in text analyses and text production is necessary in empowering students as writers in their area of discipline (Hyland 2007). This would allow for targeted support to be given to writers in dealing with academic or non-academic purpose writing (Butcher and Kintsch 2001; Hyland 2008). The quantitative analysis in this study functions as a needs analysis that allows the researcher to specifically identify, out of 36 academic writing skills, which of the academic writing skills do students in their respective discipline identify themselves to be most competent in doing and identified to be the most required skills in their field.

Table 40.9 Science education undergraduate low ranking AW tasks

Task #	Task	Mean ratings	Ranking #
2	Explain how to perform a procedure (eg. For instructional materials or manuals)	2.9	2
4	Express personal views regarding topics, situations, or issues	2.9	3
5	Explain an event or occurrence using such evidence as historical accounts, data, or research findings	2.9	4
6	Analyse and synthesize information from multiple sources (include comparison and contrast)	2.9	5
12	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	2.9	6
13	Classify information according to categories or hierarchies (eg. in outlines or organizational charts)	2.9	7
19	Use clear, efficient formats (eg. flow charts, bullet points, headings) to organize information and guide the reader (include document design)	2.9	8
3	Abstract or summarize essential information (eg. From speeches, observations, or texts)	2.8	9
7	Predict consequences or outcomes by analysing information, patterns, processes, or findings	2.8	10
16	Present data and other information in a clear and logical manner, offering explanations that make the material understandable to a particular audience (includes tables and charts as well as text)	2.8	11
26	Choose words effectively	2.8	12
34	Use word processing software to plan, create and present text	2.8	13
36	Work collaboratively to plan and compose text	2.8	14
9	Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations	2.7	15
20	Integrate quoted and referenced material appropriately into the students' own text	2.7	16
22	Clarify relationships among main and supporting ideas	2.7	17
23	Develop a well-focused, well-supported discussion, using relevant reasons and examples	2.7	18
24	Organize ideas and information coherently	2.7	19
31	Revise and edit text to improve its clarity, coherence and correctness	2.7	20
33	Avoid errors in mechanics (eg. Spelling and punctuation)	2.7	21
35	Work independently to plan and compose text	2.7	22
8	Write persuasively by constructing well-reasoned argument to support or refute a position	2.6	23

(continued)

Table 40.9 (continued)

Task #	Task	Mean ratings	Ranking #
10	Interpret data within a relevant framework by applying the findings to new situations, asking insightful questions, identifying the need for further information, or drawing conclusions	2.6	24
11	Identify problems in a proposed course of action or interpretation of events and propose solutions or alternative interpretations.	2.6	25
18	Use technical, content-specific vocabulary accurately and appropriately for a particular purpose and audience	2.6	26
21	Credit sources appropriately (eg. Use attribution, footnotes or endnotes)	2.6	27
25	Write clearly, with smooth transitions from one thought to the next	2.6	28
27	Write precisely and concisely, avoiding vague or empty phrases.	2.6	29
28	Write fluently, avoiding plodding or convoluted language	2.6	30
29	Vary sentence structure to communicate ideas effectively	2.6	31
30	Express ideas in original or novel ways to hold the reader’s interest	2.6	32
32	Use grammar and syntax that follow the rules of standard written English, avoiding errors that distract the reader or disrupt meaning	2.6	33
14	Use the conventions of a particular genre (eg. a report, proposal, poem, or abstract)	2.5	34
15	Write appropriately for a generally well-informed and thoughtful audience (eg. maintain an appropriate tone, provide sufficient context or other information for readers to understand the points being made)	2.5	35
17	Use analogy, metaphor or comparison to define or explain technical or abstract concepts for a general audience	2.4	36

The limitation of this study is that it only yields information about students’ academic writing needs based on self-rating. Future studies could run more statistical analyses to observe whether any other form of relationship between the disciplines exists. Another area to look into is the perspectives of educators and how they would rank the importance of these academic writing skills according to their disciplines and cross study with the students’ perspectives for a more wholesome needs analysis.

Findings from this study prove that although these students are from the same faculty, their academic writing needs are different according to their field of study. Consequently, the findings also suggest that there is a need to review the blanket approach of addressing these students writing needs as one entity. In higher education context, students’ academic success or academic failure is heavily determined by their ability to communicate using the academic writing discourse. Therefore, it is important that students’ academic writing needs are addressed to meet the requirements of the academic writing discourse relevant to their discipline.

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References

- Butcher, K. R., & Kintsch, W. (2001). Support of content and rhetorical processes of writing: Effects on the writing process and the written product. *Cognition and Instruction*, 19(3), 277–322.
- Chua, Y. P. (2012). *Mastering research methods*. Kuala Lumpur: McGraw Hill Education. SdnBhd.
- Giridharan, B., & Robson. (2011). *Identifying gaps in academic writing of ESL students*. Enhancing learning: Teaching and learning conference 2011.
- Hyland, K. (2006). Disciplinary differences: Language variation in academic discourses. In K. Hyland & M. Bondi (Eds.), *Academic discourse across disciplines* (pp. 17–45). Frankfurt: Peter Lang.
- Hyland. (2007). Genre pedagogy: Language, literacy and L2 writing instruction. *Journal of Second Language Writing*, 16(2007), 148–164. Science Direct, Elsevier Inc. doi:10.1016/j.jslw.2007.07.005.
- Hyland. (2008). Genre and academic writing in disciplines. *Language Teaching*, 41(4), 543–562. Plenary speeches biannual conference of the European association of the teaching of academic writing, held in Bochum. Germany, Cambridge University Press. doi:10.1017/S0261444808005235.
- Ismail, R., Yussof, I., & Sieng, L. W. (2011). Employers' perception on graduates in Malaysian services sector. *International Business Management*, 5, 184–193. doi:10.3923/ibm.2011.184.193.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 1970(30), 607–610.
- Musa, N. C., Koo, Y. L., & Azman, H. (2012, January). Exploring English language learning and teaching in Malaysia. *GEMA Online, Journal of Language Studies*, 12(1), Special section. http://journalarticle.ukm.my/3262/1/pp_35_51.pdf
- Nair, G.K.S. et al. (2012). Malaysian graduates English adequacy in the job sector. *Asian Social Science*, 8(4), 143–147. Retrieved from <http://www.ccsenet.org/journal/index.php/ass/article/view/15971>
- Nesi, H., & Gardner, S. (2012, February 23). *Genre across the disciplines: Student writing in higher education*. Cambridge Applied Linguistic, Cambridge University Press. ISBN-10: 0521149592.
- Parilah, M. S., Wan Mahmud, W. H., Din, R., Yusof, A., & Pardi, K. M. (2011). Self-efficacy in the writing of Malaysian ESL learners. *World Applied Sciences Journal*, 15, 8–11.
- Rosenfeld, et al. (2004, November). Identifying the writing tasks important for academic success at the undergraduate and graduate levels (GRE Board Research Report No. 00–04 R). Princeton: Educational Testing Service (ETS).
- Shah, N. Z. (2008). Are graduates to be blamed? Unemployment of Computer Science graduates in Malaysia. *Computer Science*, 2008. Retrieved from <http://aabss.org/Perspectives2008/AABSS2008Article6NORSHIMAZSHAH.pdf>

Chapter 41

Experiential Learning in the Wilderness: Outdoor Education Program Toward Enhancing College Students' Leadership Practices

Siti Fadhilah Abdul Hamid and Mawarni Mohamed

Abstract Lack of communication and leadership skills have become the main issues among graduates in Malaysia. The rapid changes of knowledge and technology require students to equip themselves with extra skills needed by global workplace to demonstrate the combination of soft skills together with a good degree. However, there are lacking of information, assessment and unclear program contents that can bring positive outcome toward the development of leadership skill. This study aims to examine an outdoor education program as one of the useful programs that higher education could use to identify the leadership practices among the students. It is done by comparing students who have participated in outdoor education program and those who did not participate. A total of 106 students from the Faculty of Sport Science and Recreation UiTM were involved in this study. The data was collected by using Students Leadership Practices Inventory questionnaire to measure two leadership practices namely 'Enable Others to Act' and 'Encourage the Heart'. Independent sample *t*-test was used in order to identify a significant difference of the two leadership practices between two groups of students. The results showed that there were significant differences in the leadership practices among the students who have participated in outdoor education program. Thus, this study has proposed that outdoor education program is one of the effective activities that could be offered to all students of higher education to equip them with leadership skills required for future employability.

Keywords Leadership • Outdoor education • Leadership practices • Student leadership

S.F.A. Hamid (✉)

Faculty of Sport Science and Recreation, Universiti Teknologi MARA Pahang, UiTM,
26400 Bandar Tun Abdul Razak Jengka, Pahang, Malaysia
e-mail: fadhilahamid69@gmail.com

M. Mohamed

Faculty of Education, Universiti Teknologi MARA, UiTM,
Campus Section 17, 40200, Shah Alam, Selangor, Malaysia
e-mail: mawarnim@salam.uitm.edu.my

41.1 Introduction

In order to remain competitive, most of the higher education institution now is more concerned to educate and equip their students with leadership skills (Langbein 2009; McNaboe 2011). Higher education plays a key role as an institution to develop the future leaders for the nation and as one of the suitable place to produce the future leader (Kuo 2008; Haber 2011) and most of the education institution strived to produce the successful leader for the nation. In view to that, availability of quality education as a foundation and character building through leadership trainings, embedded or in separate courses are seen as essential to develop highly potential future leaders. Furthermore, leadership skills can be learnt and taught in an academic surrounding and this situation has enhanced the leadership education program in education system especially in higher education institution. Previous researches have indicated that one of the most important skills that students should have after they graduated is leadership skill (Ahmad et al. 2007; Shahrom et al. 2007 and Norani and Noorashidi 2010). According to Sherman (2008), the leadership skill can be taught through activity and interaction outside the formal classroom such as in co-curricular activity and an outdoor education program. Similarly, Kolb (1984), indicated that students will learn something new through the activity that they involve in because experiential learning can bridge the gap between the classroom and the real world situation. Students will be more prepared to enter workforce world if they have experience in interacting with outside activity such as participated in co-curricular (Burton 2010).

Students who have participated in outdoor education program for example, feel themselves better change in beliefs, attitudes and perceptions towards the environment and their surroundings. Hence, outdoor education program is seen as one of many activities that could develop leadership skill among university students (Burridge 2004). So this study aims to identify only the perceived level of 'Enable Others to Act' and 'Encourage the Heart' leadership practices among university students by comparing those who have participated in an outdoor education program with those who did not participate.

In an effort to determine the leadership practices among the students, the following research questions were formulated:

1. What is the level of leadership practices perceived by university students who have participated in outdoor education program?
2. What is level of leadership practices perceived by university students who did not participate in outdoor education program?

The following hypotheses were examined in relation to two aspects of leadership practices:

H1 Students who have participated in the outdoor education program perceive themselves to engage more frequently in the leadership practice of 'enable others to act' than those who did not participate.

H1 Students who have participated in the outdoor education program perceive themselves to engage more frequently in the leadership practice of 'encourage the hearts' than those who did not participate.

In order to answer the research questions, descriptive statistics were used for all variables to find out the frequency, means, and standard deviation. Independent sample *t*-test was used in order to determine whether there is any significant difference in leadership practices of students who have participated in outdoor education program and those who did not participate.

'Enable Others to Act' is a leadership practice that promotes cooperative work among followers based on the leader's trust in sharing their power (Kouzes and Posner 2002). It is also about team effort whereby tasks are done in a cooperative situation (Cremer 2002). Without trust, cooperative relationship will not successful which is one important aspect in making any objectives in an outdoor activity a success. Therefore the participation in extra activities such as outdoor education program could help to foster students' engagement in cooperative relationship and build trust with each other to complete the activities in the program.

'Encourage the Heart' is the ability of a leader to encourage and motivate a team. This practice is chosen for this research as it is an important element that can ensure members in the team on track and keep on moving in whatever situations that comes along the way (Kouzes and Posner 2002). This ability is also important to avoid disagreements among team members especially when everything goes wrong and when their effort failed. 'Encourage the Heart' leadership practice recognize contribution of others and celebrate the accomplishment of the followers, one important aspect students need to acquire to be good leaders.

The two practices were chosen in this study because outdoor program usually requires members to work together, mostly with new even old members, juniors and seniors. In fact, more challenging activities demand strong encouragement and motivation to complete tasks.

41.2 Method

This study is a quantitative research design which uses questionnaires to collect data. The Student Leadership Practices Inventory by Kouzes and Posner (2002) was used to gather the data on leadership practices 'Enable Others to Act' and 'Encourage the Heart' of the students. They need to indicate the frequency of the behaviors and actions based on a Likert Scale ranging from 1- Rarely, 2- Once a while, 3- Sometimes, 4- Often and 5- Very Frequently. The target population for this study was students from the Faculty of Sport Science and Recreation, University Teknologi Mara (UiTM). There were two groups of semester four students participating in this study: Minor 1 and Minor 2 students. Minor 1 group consists of students who have participated in outdoor education program while the Minor 2 group consists of the students who did not participate in outdoor education program. These two groups of

Table 41.1 The population and sampling of respondents

Campus	Participated	Not participated	Total
Seremban	23	19	42
Arau	35	29	64
Total	58	48	106

Table 41.2 'Enable Others to Act' leadership practice perceived by students who have participated in outdoor education program

	N	Min	Max	Mean	Std. deviation
I foster cooperative rather than competitive relationship among people I work with	58	3	5	4.19	.634
I actively listen to diverse points of view	58	3	5	4.14	.605
I treat others with dignity and respect	58	3	5	4.33	.659
I support the decisions that other people in our organization make on their own	58	3	5	3.91	.629
I give others a great deal of freedom and choice in deciding how to do their work	58	3	5	4.07	.491
I provide opportunities for others to take on leadership responsibilities	58	3	5	4.14	.661

students were from UiTM Seremban, Negeri Sembilan campus and UiTM Arau, Perlis campus. The total of population and sampling in this study is 106 students where the division of the sampling is shown in Table 41.1.

Non probability sampling which is a convenience sampling was chosen for this study because the selected students are convenient accessibility (survey could be done within researcher time frame) and proximity for researcher to collect the data with the students.

41.3 Results and Discussion

Table 41.2 presented the mean scores for 'Enable others to Act' leadership practice perceived by students who have participated in outdoor education program. Result indicated that all five items on 'Enable others to Act' leadership practices showed high mean score (4.1–5.0). The highest item is "I treat others with dignity and respect" (M=4.33). For items "I support the decisions that other people in our organization make on their own" scored the lowest mean for 'Enable others to Act' leadership practices (M=3.91).

As indicated in Table 41.3, the respondents who did not participate in outdoor education program perceived low mean score in 'Enable Others to Act' leadership practice. The students' responses were typically low in their behaviors and actions

Table 41.3 ‘Enable Others to Act’ leadership practices perceived by students who did not participate in outdoor education program

	N	Min	Max	Mean	Std. deviation
I foster cooperative rather than competitive relationship among people I work with	48	2	3	2.75	.438
I actively listen to diverse points of view	48	1	4	2.85	.652
I treat others with dignity and respect	48	2	4	2.88	.489
I support the decisions that other people in our organization make on their own	48	1	4	2.81	.641
I give others a great deal of freedom and choice in deciding how to do their work	48	1	4	2.85	.652
I provide opportunities for others to take on leadership responsibilities	48	1	4	2.85	.652

in the items for the leadership practice. The highest item scored in ‘Enable Others to Act’ leadership practice is item “I treat others with dignity and respect” ($M=2.88$) and followed by item “I actively listen to diverse points”, “I give others a great deal of freedom and choice in deciding how to do their work” and “I provide opportunities for others to take on leadership responsibilities” ($M=2.85$) respectively. The lowest mean score is for item “I foster cooperative rather than competitive” ($M=2.75$).

The level of leadership practice ‘Enable Others to Act’ showed by university students who have participated in outdoor education was high ($M=4.13$) as compared to university students who did not participate in outdoor education program, with low ($M=2.83$) level of leadership practices for ‘Enable Others to Act’. The results indicated that outdoor education program has taught the participants to become a good and effective leader. Indirectly, participants learnt to act or react as a leader in order to accomplish the tasks given in the program. Findings showed that ‘Enable Others to Act’ scored higher mean level, it indicated that the students who have participated in outdoor education program were totally exposed with the cooperative situation where students were required to make decisions together and at the same time need to make sure teammates act in the right way to support the decision originally made for task completion (Higgins and Nicol 2002; Barfod 2010; Gurholt 2010). To fulfill this, the students need to trust their teammates to complete the tasks given.

There are several activities in outdoor education program that required the students to complete the tasks together as a team such as survival, kayaking, jungle trekking, management games, and others. Most of the activities cannot be accomplished by one person but requires collaboration among the teammates. However, in making sure that all members in a team do the tasks effectively can be a challenge if there is no one who can lead. So, a good leader is needed in coordinating and assigning tasks to the entire members in the team based on each individual ability and capability (Kouzes and Posner 2002).

Table 41.4 ‘Encourage the Heart’ leadership practices perceived by students who have participated in outdoor education program

	N	Min	Max	Mean	Std. deviation
I praise people for a well done job	58	3	5	4.14	.634
I encourage others as they work on activities and programs in our organization	58	3	5	3.83	.566
I give people in our organization support and express appreciation for their contributions	58	3	5	4.24	.630
I make it a point to publicly recognize people who show commitment to our values	58	3	5	4.00	.592
I find ways for us to celebrate accomplishments	58	3	5	4.12	.623
I make sure that people in our organization are creatively recognized for their contributions	58	3	5	4.34	.579

Table 41.5 ‘Encourage the Heart’ leadership practices perceived by students who did not participate in outdoor education program

	N	Min	Max	Mean	Std. deviation
I praise people for a well done job	48	2	4	2.88	.531
I encourage others as they work on activities and programs in our organization	48	1	4	2.69	.748
I give people in our organization support and express appreciation for their contributions	48	1	4	2.85	.545
I make it a point to publicly recognize people who show commitment to our values	48	1	4	2.71	.582
I find ways for us to celebrate accomplishments	48	2	4	2.81	.571
I make sure that people in our organization are creatively recognized for their contributions	48	1	4	2.79	.849

This implies that participation in outdoor education program could engage students in a cooperative situation and respect each other while completing their tasks in every activity. This showed that the students were engaged in ‘Enable Others to Act’ leadership practice.

Results in Table 41.4 indicated that most of the respondents who have participated in outdoor education program were engaged more frequently in five items in ‘Encourage the Heart’ leadership practice. Most of the respondents believed that “I make sure that people in our organization are creatively recognized for their contributions” (M=4.34), “I give people in our organization support and express appreciation for their contributions” (M=4.24), “I praise people for a well done job” (M=4.14), “I find ways for us to celebrate accomplishments” (M=4.12) and “I make it a point to publicly recognize people who show commitment to our values” (M=4.00). Respondents are less engaged with item “I encourage others as they work on activities and programs in our organization” (M=3.83).

Table 41.5 presented mean score for ‘Encourage the Heart’ leadership practice perceived by respondents who did not participate in outdoor education program.

Generally, the result indicated that the overall mean score for ‘Encourage the Heart’ was low (Less than 3.0). For item “I praise for well done job” ($M=2.88$) scored slightly higher compared to others five items in ‘Encourage the Heart’ leadership practice and for the lowest mean score is item “I encourage others as they work on activities and programs in our organization” ($M=2.69$). This indicated that the participants will only praise and encourage others in the team only when they feel like doing it.

Result indicated the level of leadership practice ‘Encourage the Heart’ perceived by students who have participated in outdoor education program was high ($M=4.11$). On the other hand, students who did not participate in outdoor education program perceived low level of leadership practice for ‘Encourage the Heart’ ($M=2.79$). Basically, all activities in outdoor education program would bring the excitement, satisfaction and challenge to the students. However, these activities may occasionally make students feel tired and frustrated (Johnson 2012). Every activity has its own goals and targets to be achieved by the students and this expectation can possibly create stress and pressure within limited time and restricted environment. In this situation, the students need encouragement and motivation and a leader plays an important role. In many situations, an effective leader is expected to be involved in and in touch with group members whenever the group feels down and demoralized. A leader enables them to act by providing technical assistance, emotional support and vision, thus makes a leader engaged in leadership practices.

As a leader, the ability to encourage and motivate the team is important to make sure that all team members are always on the right track. It is important to communicate this vision to members of the group, allowing them to respond and become part of the visioning process. Based on the findings of this study, ‘Encourage the Heart’ leadership practice scores a high mean. This revealed that participation and involvement in outdoor education program help to encourage the students to engage in leadership practices thus help them develop their leadership skills.

In the first hypothesis for leadership practice ‘Enable others to Act’, researchers have predicted students who participated in outdoor education program will engage in the leadership practice more frequently than those who did not participate in outdoor education program. The results indicated that there was a significant difference in leadership practice of enable others to act between the students who have participated in the outdoor education program and those who did not participate $t(106)=17.752$, $p\text{-value}=.000$ (Table 41.6). That is, the average score of leadership practices of enable others to act of university students who have participated in the outdoor education program ($M=4.13$, $SD=.367$) was significantly different from university students who did not participate in outdoor education program ($M=2.83$, $SD=.383$).

Table 41.6 Independent sample t test of enable others to act leadership practice

	Participated (Mean)	Not participate (Mean)	T test	p-value
Enable others to act	4.13	2.83	17.752	.000

Table 41.7 Independent sample *t* test of encourage the heart leadership practice

	Participated (Mean)	Not participate (Mean)	<i>T</i> test	p-value
Encourage the heart	4.11	2.79	15.870	.000

One example in engaging the ‘Enable Others to Act’ leadership practice in outdoor education program is in Camp Craft activity. This activity requires students to set up a proper campsite. It is important to deliver the task effectively within the time given. In this situation, students will learn how to become a good leader in enforcing power, divide the tasks and ensure the task accomplishment through process of planning, organizing, leading and controlling the situation. Therefore, university students who have participated in the outdoor education program were reported to engage more frequently in the leadership practice of enable others to act than those who did not participate.

In the second hypothesis, researchers predicted students who have participated in the outdoor education program would be engaged more frequently in the leadership practice of ‘Encourage the Heart’.

The independent samples *t*-test was run to determine the difference in leadership practice of ‘Encourage the Heart’ of the university students. The results indicated that there was a significant difference in leadership practice of ‘Encourage the Heart’ between the students who have participated in the outdoor education program and those who did not participate $t(106) = 15.870$, $p\text{-value} = .000$ (Table 41.7). That is, the average score of leadership practices of ‘Encourage the Heart’ among university students who have participated in the outdoor education program ($M = 4.11$, $SD = .400$) was significantly different from their friends who did not participate in outdoor education program ($M = 2.79$, $SD = .458$).

By encouraging each other in the group they are strengthening the relationship among the team members. This is one of the positive outcomes of involvement and participation in outdoor education program that they can bring back after completing the program (Lund 2013). Therefore, university students who have participated in the outdoor education program were reported to engage more frequently in the leadership practice of ‘Encourage the Heart’ than those who did not participate.

41.4 Conclusion

Findings of this study revealed that students who have participated in outdoor education program are more frequently engaged in ‘Enable Others to Act’ and ‘Encourage the Heart’ leadership practices. This revealed that participation in outdoor education program is able to give an experience to the students to work cooperatively among them and trust each other in order to deliver the tasks given. Besides, the involvement in outdoor education program also exposed the students

with situations where they need to praise their teammate for the job successfully delivered and encourage others in fulfilling the goals when team members are frustrated with a particular task. Leadership effectiveness is measured in terms of how successful the leader is in motivating behavior despite resistance. A leader must provide the encouragement to motivate members to carry on. Therefore, they will celebrate the success together with the satisfaction of what they have done in achieving the goal (Burnik and Mrak 2010).

These findings are supported with the theory of student's involvement and experiential learning. Students develop their personalities and skills during their university experiences (Nicoli 2011) and the involvement in activities at higher education gave an impact toward students learning and development (Astin 1993; Pascarella and Terenzini 2005). University students perceive that they develop the leadership skill through the engagement and experiences in activities and programs during their time at the universities. Therefore, through the involvement in outdoor education program, students have the opportunities to learn, observe and practice the leadership skills (Anderson 2012 and Astin 1993).

Outdoor education program is an experiential learning process where the students learn by doing through the exposure outside the classroom and the learning process involve between people and the natural resources (McLeod et al. 2008), as well as building relationship within the team members. This relationship helps students develop their interpersonal and intrapersonal skills where these skills are also important in order to develop leadership skills among students (Bailey 2003).

Some recommendations for the study may include the implementation of outdoor education and leadership development courses offered as a subject or embedded in the curriculum development. Higher education institution for instance can also establish cooperation with the Ministry of Youth and Sports which has a specific Recreation Department to provide experts in outdoor training for full time or part time basis. Besides that, the experts can act as mentors for knowledge transformation program for lecturers and staff.

Thus, this study is hoped to be the potential reference to provide a better understanding especially among the educators and university's administration regarding the significant roles and practices of outdoor education programs towards the development of leadership skills and practices among university students.

References

- Ahmad, E., Jailani, Y., & Noraini, K. (2007). Persepsi pensyarah terhadap penerapan kemahiran kepimpinan menerusi kokurikulum di politeknik. *1*(2), 50–61. Retrieved from <http://eprints.uthm.edu.my/2175/>
- Anderson, M. D. (2012). *The leader development of college students who participate in different levels of sport*. The Ohio State University, Thesis collection.
- Astin, A. W. (1993). Student involvement: A developmental theory for higher education. *Journal of College Student Development*, *41*, 518–529.

- Bailey, P. L. (2003). *Rekindling the spirit of adventure: Through participation in the expedition component of the Duke of Edinburgh's Award: The value of this challenge for the participant*. University of Wollongong thesis collections.
- Barfod, K. S. (2010). *Outdoor education in compulsory education, a European perspective*. Paper presented at the encountering, experiencing and exploring nature in education. In 10th conference's collection of papers.
- Burnik, S., & Mrak, I. (2010). *Mountaineering as an important part of outdoor education*. Paper presented at the encountering, experiencing and exploring nature in education. 10th conference's collection of papers.
- Burridge, P. (2004, July). *Do journey style education programs lead to change? – What the participants think*. International outdoor education research conference proceedings, La Trobe University, Bendigo, Vic, Australia.
- Burton, M. E. (2010). *Experiential education and social justice: Philosophical and methodological considerations for integrating experiential learning in educational leadership*. Doctoral dissertation. Available from ProQuest Dissertation and Theses database. (UMI Number: 3403675).
- Cremer, D. D. (2002). How do leaders promote cooperation? The effects of charisma and procedural fairness. *Journal of Applied Psychology*, 87(5), 858–866.
- Gurholt, K. P. (2010). *Concepts of nature in outdoor education*. Paper presented at the encountering, experiencing and exploring nature in education. 10th conference's collection of papers.
- Haber, P. (2011). *Perceptions of leadership: An analysis of college students' understandings of the concept of leadership*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI Number: 3475604).
- Higgins, P., & Nicol, R. (2002). *Outdoor education: Authentic learning in the context of landscapes* (Vol. 2).
- Johnson, J. W. (2012). *The effect of high school outdoor-based adventure leadership programs in independent schools on personal effectiveness and locus of control*. Master's thesis. Available from ProQuest dissertation and theses database. (UMI No. 1510668).
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs: Prentice-Hall.
- Kouzes, J. M., & Posner, B. J. (2002). *Leadership challenge* (3rd ed.). San Francisco: Jossey-Bass.
- Kuo, E. W. (2008). *The role of college in leadership development among Asian Pacific American and white students*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI No. 3347042).
- Langbein, M. L. (2009). *The effects of age and experience on levels of leadership practices of nontraditional undergraduate management students*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI Number 411037).
- Lund, B. L. (2013). *A comparison of leadership practices of collegiate student athletes and non-athlete peers: Seeking solutions to the leadership succession crisis in corporate America*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI No. 3563003).
- McLeod, B., & Craig, S. A. (2007). An evaluation of an experimental learning and outdoor education school program on the life effectiveness skills of middle schools boys. *Australian Journal of Outdoor Education*, 11(2).
- McNaboe, D. (2011). *A study of the relationship between participation in Marietta college's McDonough leadership program and the leadership development of college students*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI 3530534).
- Nicoli, G. T. (2011). *The impact of co-curricular involvement on college students' need for cognition*. Iowa: University of Iowa.
- Norani, M. N., & Noorashidi, B. (2010). Penerapan kemahiran generik dalam kurikulum di kalangan pelajar tahun akhir sarjana muda teknologi serta pendidikan. *UTM*, 1–9. Retrieved from <http://eprints.utm.my/10462/>

- Pascarella, E., & Terenzini, P. (2005). *How college affects students (vol. 2): A third decade of research*. San Francisco: Jossey-Bass.
- Shahrom, M. Z., Fatimah, S., Noor, E., Ahmad Basri, & Hassan, B. (2007). *Penilaian kemahiran insaniah dalam kursus sistem bioreaktor kw4113*. Paper presented at the seminar Pendidikan Kejuruteraan dan Alam Bina 2007.
- Sherman, W. (2008). *The effects of a formal leadership program on students' views and interactions with diverse others*. Doctoral dissertation. Available from ProQuest dissertation and theses database (UMI No. 3334652).

Chapter 42

Teachers' Perceptions on Ethics When Using Social Medias: A Preliminary Study

Hema Rosheny Mustafa and Noor Hidayah Ahmad

Abstract The rise of social media has given impact on the society at large and educators specifically. Educators today are encouraged and driven to include social medias in teaching and learning to accommodate and be at par with students who are literally more IT-savvy. The images and videos range from students' worksheet to students' behaviour in class are being shared on social media and some even become viral. However, to what extent are teachers aware of ethics in using social media in relation to the students' matter? This preliminary study was conducted among secondary school teachers in Malaysia using a survey. This paper discusses teachers' perceptions on codes of conduct/ethical codes and acceptable behaviour in relation to the use of social medias. Findings suggest there is a need to develop codes of conduct/ethical codes in relation to the use of social medias among teachers in Malaysia and incorporate ethics curriculum in the teacher training program.

Keywords Ethics • Teachers • Social medias

42.1 Introduction

The constant change of information and communication technology has not only affected the individuals but the society as a whole which is made up by those individuals. This change brings along ethical issues that have to be confronted both in the private life of the individuals as well as their professional life. These ethical issues call for ethical rules that mould and guide the individuals on how to behave and act in certain situations or conditions (Nicoli 2008). The behaviour and action of these

H.R. Mustafa (✉)

Faculty of Education, University of Tasmania, Newnham 7248, TAS, Australia

Language Academy, Universiti Teknologi Malaysia, Johor Bahru 81000, Johor, Malaysia

e-mail: hema.mustafa@utas.edu.au

N.H. Ahmad

Faculty of Education, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia

e-mail: hidayah7879@gmail.com

individuals will later reflect the group and organization that they are working with. Thus, ethics is a vital part of an individual's life in order for him/her to function in an organization and society as a whole. It is even more vital for educators to be aware of the ethics when logging into social medias. This paper identifies (i) teachers' perceptions on codes of conduct/ethical codes and (2) teachers' perception of acceptable behaviour or conduct in relation to the use of social medias. In order to achieve these objectives, the following research questions were constructed, (i) Are there codes of conduct/ethical codes for teachers in Malaysia?, (ii) How do teachers' perceive acceptable behaviour of teachers on social medias?, and (iii) Who and what is involved in developing code of conducts in social medias for teachers in Malaysia?

42.1.1 Ethics Education Among Teachers

The rise of the social media (Facebook, Twitter, Instagram and others) has impacted society all over the world. Despite the benefits of bringing people from different geographical location closer, they also create ethical issues. The information revolution is not merely technological; it is fundamentally social and ethical (Bynum and Rogerson 2004). This concerns even more for teachers as they are the agent of social change. The way teachers conduct activities online, particularly on social medias may have a social impact both on themselves and their profession. The lack of emphasis on ethical and moral dimensions in teacher education practise (Willemse et al. 2005) may be the reason of servicing teachers' privation of awareness of ethical issues particularly cyberethics. This is further supported by a study which indicated the less emphasis of ethics in education programs compared to other professional fields, such as medicine and law programs (Glanzer and Ream 2007) and this later will create a problem as educators face challenging ethical dilemmas just like any other other professions (Warnick and Silverman 2011). In view of this, more teacher training institutes start to incorporate ethics education in their teacher training programs. However, the other concern may have been on servicing teachers who had not have gone through ethics education (cyberethics) when doing their training.

42.1.2 Ethics in Using Social Medias

With the rapid increase in the use of social medias, teachers nowadays face another challenge of ethical dilemmas both in using social medias in the classroom and out of the classroom. Although it may seem that teachers' use of social medias out of the classroom is of their own personal responsibility, they are still governed by ethical conducts that oversee their profession. A dilemma arises when the regulatory codes of conduct meet emerging technologies that redefine heretofore well-established boundaries between private and public, personal and professional/student, and even leisure and school/work (Henderson et al. 2014, p. 2). This calls for code of conducts or ethical codes to be outlined in order to safeguard both teachers and students when

they conduct interactions online. A survey conducted among 2379 teachers in 24 countries (excluding Malaysia) shows that only 51 % said their school has a code of conduct for how teachers and students communicate with each other through social medias (Norton Online Family Report 2011). Perhaps the code of conducts should be directive from higher authorities such as Ministry of Education or Teachers Council. New Zealand Teachers Council, for example, has laid out guidelines for teachers when using social media,

“Before having one-on-one conversations using social media, consider ethical risks that could arise. Act the same way when using social media, as you would in a face to face setting”. (New Zealand Teachers Council 2015)

In view of this, it is perhaps paramount that teachers in Malaysia too have a guideline when it comes to conducting interactions online.

42.2 Method

To achieve the objectives of the study, a survey was used. The survey questionnaire was adapted from Questionnaire on Codes of Conduct for Primary School Teachers to 25 countries which do not have codes of conduct (IIEP-UNESCO 2009). Some of the questions were adapted to suit with the objectives of this study particularly the questions on teachers' perception on behaviours when using social medias.

42.2.1 Instrumentation

The survey comprised 9 questions; 8 questions required participants to tick the options given, and 1 open-ended question (Table 42.1). The survey was distributed in two secondary schools (one in Selangor and one in Johor). Twenty survey questionnaires were distributed and only 12 were returned. Question 1 and 2 were included to examine whether codes of conduct/ethical codes and other documents that guide and govern teachers' conduct exist in Malaysia. Question 3, 4 and 5 were designed to investigate teachers' perception on the acceptability of behaviour or conduct of using social medias and their experience. Question 6 and 7 asked for the person responsible in designing codes of conduct/ethical codes in relation to the use of social medias among teachers and its principal characteristics while Question 8 investigated teachers' awareness of Standard Guru Malaysia. Question 9 looked into the demographic data of the participants.

42.3 Results and Discussion

The results of the survey are shown in Table 42.1.

The demographic information of the respondents can be seen in Question 9. All the respondents were female teachers with 75 % ($N=9$) of them were in the 30–45

Table 42.1 Results of the survey

Questions	Results		
1. Does a code of conduct/ethical code for teachers exist in Malaysia?	Yes (12)		No (0)
2. Are there any other documents (laws, regulations, directives) to regulate teachers' conduct?	Yes (5)		No (5)
3. What is your opinion of the following attitudes of a teacher? <i>(one answer maximum per line)</i>	Acceptable	Not acceptable	Not at all acceptable
Digitally record students' misbehaviour in class	12		
Share digital recordings of students in class in social media	10		2
Share other people's digital recording of students in class through social media		9	3
Take photos of students without permission		12	
Share photos of students in social media	4	8	
Share other people's photos of students through social media		10	2
Share students' sloppy work with colleagues	4		8
Share students' sloppy work in social media		3	9
Share other people's students sloppy work through social media		4	8
4. Which of the above categories have you experienced? Do you think it is ethical? Please give a reason.	<i>Responses will be discussed below.</i>		
5. Do you think there should be a code of conduct/ethical code when it comes to the use of social media among teachers (especially concerning issues related to students)?	Yes	4	
	No	4	
	Most probably	4	
6. If Yes, who should be involved in developing a code of conduct in social media in Malaysia?	Yes	No	
Ministry of Education	4		
State of Education Dept.	4		
Teacher Union	3	1	
Schools	4		
Non-governmental Organisations (NGOs)		4	
If you answer <i>No</i> or <i>Most probably</i> for Question 6, please state a reason.			
7. How would you perceive the principal characteristics of a code of conduct in Malaysia in relation to the use of social media among teachers?	Yes	No	
It should be a legal document	8	4	
It should contain rules for administrative procedure	8	4	
It should describe rules for conduct	12		
It should describe ethical principles	12		
It should be formulated in a positive manner (what should be done...)	12		
It should be formulated in a negative manner (what should not be done...)	12		
It should be about teachers' duties	8	4	
It should be about teachers' rights	12		

(continued)

Table 42.1 (continued)

8. Are you aware of the existence of Standard Guru Malaysia (SGM)?		
Yes		4
No		0
Heard about it but not sure of the content		8
9. To conclude, please give us the following information about yourself: (one answer maximum per question)		
You are	Male	0
	Female	12
Age	Less than 30	3
	Between 30 - 45	9
	More than 45	0
Types of social media you usually used	Facebook	12
	Twitter	4
	Instagram	4
	Others:	
Frequency of using social media	2-3 hours a day	4
	More than 3 hours a day	8
	Less than 2 hours a day	

years of age. It could be deduced that most of them have at least 5 years of teaching experience if they were to graduate from teacher training program at the age of 25. The data also showed that all of them used Facebook and this could explain the 13.3 million Facebook users in Malaysia (Mahadi 2013). Only four of them used other types of social medias (Twitter and Instagram). The majority of the respondents used social medias more than 3 h a day.

The teaching experience that was deduced earlier could explain the response for Question 1 as all respondents were aware of the existence of codes of conduct/ethical codes for teachers in Malaysia. However, Question 2 received mixed responses from the respondents as illustrated in Table 42.1 that there were equal number of them who answered ‘Yes’ and ‘No’ while the other two respondents left it blank. Perhaps those two were not sure and this option is not given in the questionnaire. These mixed responses could indicate that these teachers were not in the know whether such documents that govern their conducts exist. Perhaps they were not exposed to it while they were in teacher training program. The teaching of moral and ethics is being neglected in teacher education whereas it should be given greater emphasis as teacher training program is the place to inform new teachers of the moral and ethical dimensions of the teaching profession (Campbell 2008). Since education is seen as a ‘changing agent’ to change people in certain ways involving personal and hierarchical relationships, therefore, teaching is a profession where ethical issues are central and ethics education is vital to support the code of professional conduct (Carr 2006; Snook 2003).

Question 3 investigated teachers’ perception on the acceptable behavior or conduct particularly in using the social medias. All respondents agreed that it was

acceptable to digitally record students' misbehavior in class. However, it was not known what was the purpose of digitally recording students' misbehavior in class. Perhaps if there was any issue such as fighting among the students, teachers were able to use the digital recording as a proof for further investigation. The following question showed 10 respondents felt that it was acceptable to share digital recordings of students in class in social medias while the majority felt it was unacceptable to share other people's digital recording of students in social medias. It could be deduced that teachers viewed sharing of digital recordings of their own students as a proper conduct but not of other people's students. It would be interesting to further investigate what kind of things that teachers digitally record of their students that they shared on social medias. Despite this, all respondents felt that it was not acceptable to take photos of students without their permission. This response contradicted with the earlier response that it was acceptable to digitally record students' misbehavior. Again the response of sharing photo of students in social medias and other peoples' students received a majority of not acceptable behaviour on the teachers' part. Perhaps respondents were aware of the ethics of sharing things on social medias as indicated in the terms of agreement, for example, in Facebook. The majority of respondents indicated that it was not at all acceptable to share students' sloppy work both with colleagues and in social media. Perhaps they viewed this conduct as a humiliation to the students and students' confidentiality was the teachers' responsibility. Similar view was reported by teachers in Australian schools in which confidentiality issue is one of the ethical dilemmas that includes "talking about students' personal/ family issues in a staff-room" but they believed that "school matters should be kept within school walls, particularly in cases of students at risk" (Boon 2011: p.84).

Question 4 is an open-ended question that received positive response from the respondents. Some of the responses showed that teachers used to have the experience of digitally recording and taking photos and sharing them in social media. They viewed these as acceptable conduct because their intention was to highlight students' achievement in class or school. These responses clearly justified their choice of the earlier questions (Question 3).

"Record/ take photos of students and post them in FB..I think it's ethical if we were to share something that is good such as the students' achievement and others".

"I posted photos of my students in FB especially during school events. It is ethical because I did not post something that is unethical online".

"I used to see people shared other people's students sloppy work through media. It's not ethical because if the students themselves get to know, It's an insult to them... it will most probably demotivate them to do any work given by the teacher in the future".

The last quotation from the respondent showed that there was repercussion if teachers were not aware of the good conduct that they were supposed to practice while logging onto social medias. The short-term or long-term repercussion could affect both the affected students and teachers, and perhaps the school in general.

There were equal responses to Question 5 as four who believed that there should be codes of conduct/ethical codes viewed that all parties in Question 6 were responsible in developing them to govern teachers' behaviour or conduct when using the social medias. However, non-governmental organisations were seen as irrelevant in the parties involved to develop the codes of conduct/ethical codes particularly matters related to the use of social media among teachers. Four respondents who chose *No* in Question 5 believed that teachers had the capacity to think of the repercussion and effects to not behave inappropriately on social medias.

"This issue is beyond one's control. Teachers are educated people and they know their limits".

However, teachers need to be aware that ethical issues existed in all academic disciplines (Lovat and Toomey 2007) and the knowledge and skills that teachers possess should be underpinned by ethical dispositions and moral manner which guide what is good, right, virtuous, and caring (Osguthorpe 2013). The other four who opted for *Most probably* perceived that although teacher were able to conduct appropriately on social media, there was still a need to have codes of conduct/ethical codes to ensure that teachers do not go beyond limits.

"I think most teachers are fully aware of the extent of things that they want to share in social media. However, by having a code of conduct, it might help the teachers on the do's and dont's".

The majority agreed that if such codes were to be developed, they should be a legal document that highlighted rules of conduct and written in both positive and negative manner. They should also indicate teachers' duties and rights when conducting activities in social medias. Therefore, these codes of conduct/ethical codes are documents that teachers could depend on before engaging in social medias especially involving matters related to the students.

Question 8 investigated teachers' awareness of *Standard Guru Malaysia (SGM)* which was a document that highlighted teachers' conduct and behaviour in the teaching profession. Result showed that four of the respondents were aware of the existence while the majority had heard about it but not sure of the content. Further search was conducted by the researcher on the official website of Ministry of Education of Malaysia showed no result when the keyword SGM was keyed in the *Search* column. However, SGM was mentioned in the Report Card on The Implementation of Education Development Master Plan 2006–2010;

"Standard Guru Malaysia (SGM) is used as a reference of quality standard for teachers in the whole country. It acts as an initial warning system so that teachers are aware of the needs to implement..... It has two specific components which is standard component (ethics and practice of teaching profession,.....and needs component.... SGM will be piloted to novice teachers at schools in Klang Valley in August 2007". (Ministry of Education Malaysia 2007)

Thus, this raised a question of whether SGM had yet be piloted to other states in Malaysia as this shaped the ethical conduct of teachers in Malaysia. Perhaps SGM could be developed to contain three sets of codes; (i) codes of ethics, (ii) codes of conduct, and (iii) codes of practice (Gotterbarn 2000) for every teachers to function

socially and ethically appropriate in social media. Codes of ethics acts as mission statements that provide visions and objectives for the profession, while codes of conduct address the professionals' attitudes and behaviours and codes of practice describes the operational activities within a profession.

42.4 Limitations

There are several limitations that should be acknowledged in this preliminary study sample and survey questions. One major limitation is the limited number of survey questionnaire being distributed, completed and returned. The data described only the 12 respondents in which all were female teachers. Thus, the findings shed light on these respondents' perceptions of ethics in using social medias but cannot be generalized to all teachers in the country as the number did not represent the whole population of teachers in Malaysia. The second limitation is the limited number of questions in the survey questionnaire. The nine questions did not offer an in-depth exploration on teachers' perceptions, particularly on the acceptable behaviour when using social medias as there are a lot more actives conducted online. Future research could add more questions in the survey questionnaire and conduct the study in a larger scale by distributing questionnaires to all states in the country.

42.5 Conclusion

This preliminary study highlights teachers' perceptions on codes of conduct/ethical codes and acceptable behaviour in relation to the use of social medias. Although teachers were aware of the codes of conduct for teachers, there is a need to highlight its importance whenever the school had the chance to. As more teachers logged into social medias, there should be codes of conduct/ethical codes to guide teachers to conduct appropriate behaviours online especially matters related to their students such as sharing students' work. As education is seen as an 'agent' of change, ethics should underpin the teaching values, professional standards and reflective practise of the teachers (Sadler et al. 2006). Perhaps codes of conduct/ethical codes should be incorporated in the teacher training curriculum so that when these teachers went into the service, they were well-equipped with the appropriate conduct or behaviour that should be practised especially when logging into the social medias. In addition, this would also benefit the students as they viewed teachers who showed genuine care in their pedagogy was a reflection of the teachers' ethics and moral positions (Arthur 2010).

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References

- Arthur, J. (2010). *Of good character: Exploration of virtues in values in 3–25 year olds*. Exeter: Imprint Academic.
- Boon, H. (2011). Raising the bar: Ethics education for quality teachers. *Australian Journal of Teacher Education*, 36(7), 76–93.
- Bynum, T., & Rogerson, S. (2004). *Computer ethics and professional responsibility*. Malen: Blackwell Publishing.
- Campbell, E. (2008). The ethics of teaching as a moral profession. *Curriculum Inquiry*, 38(4), 357–385.
- Carr, D. (2006). Professional and personal values and virtues in education and teaching. *Oxford Review of Education*, 32, 171–183.
- Glanzer, P. L., & Ream, T. C. (2007). Has teacher education missed out on the “ethics boom”? A comparative study of ethics requirements and courses in professional majors of Christian colleges and universities. *Christian Higher Education*, 6(4), 271–288.
- Gotterbarn, D. (2000). Computer professionals and YOUR responsibilities. In D. Langford (Ed.), *Internet ethics* (pp. 200–219). New York: St. Martin's Press.
- Henderson, M., Auld, G., & Johnson, N. F. (2014). *Ethics of teaching with social media*. Paper presented at the Australian computers in education conference 2014, Adelaide, SA. <http://acec2014.acce.edu.au/session/ethics-teaching-socialmedia>. Accessed 2 Mar 2015.
- IIEP-UNESCO. (2009). Questionnaire on codes of conduct for primary school teachers (Country without codes). http://teachercodes.iiep.unesco.org/teachercodes/contact/Questionnaire2_ENG.pdf. Accessed 21 Aug 2014.
- Lovat, T., & Toomey, R. (2007). Values education – A brief history to today. In T. Lovat & R. Toomey (Eds.), *Values education and quality teaching: The double helix effect* (pp. xi–xix). Terrigal: David Barlow Publishing.
- Mahadi, N. (2013). 13.3 million M'sians are facebook users. Borneo post online. <http://www.the-borneopost.com/2013/06/16/13-3-million-msians-are-facebook-users/>. Accessed 10 Sept 2014.
- Ministry of Education Malaysia. (2007). Report card on the implementation of education development master plan 2006–2010. http://www.moe.gov.my/upload/galeri_awam/penyelidikan/2007/2007_BTMMK_4_7566_6886.pdf. Accessed 15 Sept 2014.
- New Zealand Teachers Council. (2015). Guidelines on ethical use of social media. <http://www.teachersandsocialmedia.co.nz/>. Accessed 2 Mar 2015.
- Nicoli, M. V. (2008). A web-based questionnaire of ethical skills. www.it.uu.se/research/project/itethics/mayte.pdf. Accessed 2 Oct 2014.
- Norton Online Family Report Identifies Issues of “Cyberbaiting” and Overspending. Press release in mountain view, California – November 17, 2011. http://www.symantec.com/about/news/release/article.jsp?prid=20111117_01. Accessed 3 Mar 2015.
- Osguthorpe, R. D. (2013). Attending to ethical and moral dispositions in teacher education. *Issues in Teacher Education*, 22(1), 17–28.
- Sadler, T. D., Amirshokoohi, A., Kazempour, M., & Allspaw, K. M. (2006). Socioscience and ethics in science classrooms: Teacher perspectives and strategies. *Journal of Research in Science Teaching*, 43, 353–376.
- Snook, I. (2003). *The ethical teacher*. Palmerston: Dunmore Press.
- Warnick, B. R., & Silverman, S. K. (2011). A framework for professional ethics courses in teacher education. *Journal of Teacher Education*, 62(3), 273–285.
- Willemse, M., Lunenberg, M., & Korthagen, F. (2005). Values in education: A challenge for teacher educators. *Teaching & Teacher Education*, 21(2), 205–217.

Chapter 43

Using Class Blogs in Improving Lower Secondary School Students' Motivation in Understanding Literature in Muar

Saiful Izwan Zainal and Norazrin Zamri

Abstract In this era of modernisation, there is apparently a heightened role of technology in improving the quality of educational management. Among the many changes that have immensely affected the field of educational management are associated with Internet technology. One of the elements of the Internet that can be applied in this field is the use of blogs. This study, therefore, aims to identify the factors in the use of class blogs that can help educational leaders to improve students' motivation in understanding English literature at the lower secondary level in schools in Muar. This study employs Instructional Leadership Theory as its theoretical framework. The study was carried out in Muar, Johor, involving ten Heads of English Department and one hundred lower secondary students, selected from ten schools in the district. Two research instruments employed were questionnaires and semi-structured interviews. The study showed that the majority of the respondents (educational leaders and students) agreed that class blogs are able to assist educational leaders to motivate lower secondary students in understanding English literature. The findings of this study can be used as a reference for other educational leaders to apply the use of blogs in their management.

Keywords Blogs • Educational management • English literature • Instructional leadership • Motivation

S.I. Zainal (✉)

Faculty of Education and Social Sciences, UNITAR International University,
Kelana Jaya, Petaling Jaya 47301, Selangor, Malaysia
e-mail: saifulizwan_84@yahoo.com

N. Zamri

Academy of Language Studies, Universiti Teknologi MARA,
Shah Alam 40450, Selangor, Malaysia
e-mail: norazrin@hotmail.com

43.1 Introduction

ICT is undeniably important to help school administrators in making decisions, adapting to change and to further enhance communication within the organization (Kulanz 2010).

The quotation above is an exemplification of the heightened role of technology in improving the quality of educational management in this era. The question is, “what is the cause of this phenomenon?”, that it plays a very big influence in the development of information dissemination at present. The use of blogs has been expanding in line with the mass use of the Internet. Blogs originate from one of the branches of the social networking system also known as the Web 2.0, which is more generically known as social media (Caverly et al. 2008, p. 34). As blogs have been used in other aspects of education, educational managers should take advantage of the use of blogs, particularly to increase students’ motivation in teaching, learning and management.

Trying to motivate students to learn English Literature is not an easy task. The difficulty for teachers to gain students’ attention and motivate them directly would make it even more difficult to ensure students’ understanding in the classroom. A survey conducted by Sarjit and Rosy (1999) suggests that even first year university students majoring in English language and literature found reading literary texts a major problem. Thus, this study is considered relevant and necessary to be implemented to identify the true potential of blogs in providing an alternative to increase students’ motivation.

One of the general functions of blogs is to allow ideas to be shared with selected audience or the public (Blogger 2009). This might provide students with the opportunity to spread their opinions or information on literary texts to the readers that they wish. Research shows that most students will give more attention to their work if they realize that they have the audience (Brooks-Young 2005). This signifies that blogs might be able to help in improving students’ motivation and interest, enhancing the quality of their learning primarily for disseminating information, providing instant feedback and testing test students’ abilities. However, not many studies discuss the potential of blogs in raising the quality of students’ learning (Ellison and Wu 2008) and only a few analyses have been done on the use of blogs as a teaching aid in the classroom (Borja 2005). Many previous studies also only featured the functions of blogs to help teachers and students, but in this study, the use of blogs to motivate students in learning literature will be studied from the perspective of educational leaders.

Considering that one of the important roles of educational leaders is related to leading for learning, this study, therefore, will employ the Instructional Leadership theory as the theoretical framework. Instructional leadership encompasses “those actions that a principal takes, or delegates to others, to promote growth in student learning” (Debevoise 1984, p. 14). The term instructional leader clearly describes the primary role of the leader in the quest for excellence in education. To achieve this quest, it will take more than a strong principal with substantial ideas. According to Richardson et al. (1989), he or she who leads towards educational achievement must be a person who makes instructional quality the top priority of the school and materialise that vision.

Although Instructional Leadership is typically associated with school principals' leadership, this study will focus on the leadership of Heads of English Panels in schools. This is because the Panel of Heads of English is the head of the teachers who has direct roles in the school administration. Besides, this kind of distributed leadership may be very useful to facilitate the administration of schools (Southworth 2002 as cited in MacBeath et al. 2005). Instructional Leadership theory is also a suitable theoretical framework in this study because most of the criteria of Instructional Leadership are in line with the normal uses of blogs as mentioned earlier.

43.1.1 Statement of the Problem

Educational leaders often face problems to motivate students to learn, especially in learning literature. It cannot be stressed enough that motivational factor is one of the most important aspects to meet the learning objectives of ESL courses (Brown 1994). One of the best ways to enhance students' motivation in English Literature learning is to improve methods in which it is learnt. Typical English literature learning is not only considered boring to some, but is also considered quite intimidating (Hunt and Barnes 2006). This will inevitably lead to less motivated students since normal English literature lessons are considered not interesting. The issue of lack of interest to study English literature is very worrying because it could be the reason why the grades for the English subject in schools are lower, since English literature contributes a huge part to the total marks for the English subject. That is why this study is perceived to be relevant as it may help educational leaders to come up with alternatives to motivate students to study English literature.

Another issue that will be addressed is the communication between educational leaders with the teachers and students. Communication amongst the educational leaders, teachers and students is oftentimes too limited. This makes it quite difficult for educational leaders to trace students' learning problems, or to provide feedback to students. The current means of communicating with teachers and students is very much limited to the classroom time and space (Kuzu 2007). Class blogs, which can be used anywhere at any time, have the potential to be a tool which could raise the quality of assessment and provision of feedback to students, which will directly increase their motivation to study English Literature more. This will ultimately lead to a more effective management of ESL education as a whole.

43.1.2 Research Questions

The following three specific research questions have been formulated to guide this research:

1. What are the factors in the use of blogs that can help management improve students' motivation to learn English literature at the lower secondary level in schools?

2. What are the challenges that entail from the use of blogs in educational management?
3. What is the relationship between the uses of blogs with the increase of Malaysian lower secondary students' motivation to learn English literature?

These questions serve as the basis for the research methods and the analysis of findings in this study.

43.2 Research Methodology

The setting of the study, research instruments used, sampling methods, data collection methods and data analysis procedures are discussed in the following sub-sections.

43.2.1 Research Setting, Research Instruments and Sampling Method

The research was undertaken in Muar, Johor. Five rural secondary schools and five urban secondary schools in Muar were randomly selected for this study. Ten secondary schools in Muar were selected for the study. The selection of the school was based on the willingness of the English Head of Department at those schools selected to take part in the study. Two research instruments were employed in achieving this study's research objectives: questionnaires; and semi-structured interviews. The researchers applied the triangulation procedure for this study. Cohen and Manion (1980) define triangulation as: the use of two or more methods of data collection in an investigation of the study. The main instrument used in this study was questionnaires, to yield quantitative data whilst the semi-structured interview was used to yield qualitative data in order to answer the research questions.

The participants of this study consisted of lower secondary Heads of English Panel and lower secondary students from ten schools around Muar, Johor. Firstly, the participants for the questionnaire-completion method were 100 lower secondary students from ten (10) secondary schools around Muar. Ten (10) students were selected from each school. Only ten (10) students were selected from each school because the results obtained were deemed sufficient for the objectives of the study.

There were a number of criteria set for the purpose of sample selection. This study employs purposive sampling as the participants are those who had been identified to have at least basic understanding of the use of blogs and ICT, more experience with blog use and varied learning experiences and proficiencies. Only students from public secondary schools were selected for this research. This is because compared to private schools, public schools have a more standardized curriculum.

Only genuinely willing participants were selected for the study to get honest and accurate answers. Their permission and willingness to participate in the study were ensured before they were selected to be the respondents of the study. To maintain their anonymity, all the participants for questionnaires would not be referred to by their real names, but only referred to by the schools they belonged to. Finally, only students who were studying at the lower secondary level were chosen. This is because the materials that are covered for this study are focusing specifically on the English Literature syllabus for lower secondary level.

Another group of participants were ten (10) Heads of English Panel for lower secondary level from ten schools around Muar, Johor. Although Instructional Leadership is often associated with leadership of school principals, but in schools, heads of English panels are also considered as the leaders of the teachers. That is the reason why the Heads of English panels were chosen as the major respondents for this study. Some of the criteria set for the above sample selection are: the selected leaders have been using the blog for a set period of time in their management; most of them were willing to set their own blogs; the leaders possessed good understanding of the use of ICT in management; and most of the Heads of English Department selected were quite young and very familiar with the use of ICT.

Semi-structured interviews with selected lower secondary Heads of English Panel were also conducted. The interviews were conducted to obtain more comprehensive data on the issue. The interviews were semi-structured, i.e. they were guided by a predetermined set of interview schedules, but sub-questions were asked, where appropriate. The interview was piloted with a participant, but no changes were made since the participant said that the questions were appropriate and clear.

43.2.2 Data Collection Methods

The data collection procedures involved face-to-face and online sessions with the participants. The questionnaires were all distributed personally to the participants. They completed the questionnaires within 15 min and the questionnaires were collected right away by the researcher. Participants' queries were attended to and clarified, as needed, during the process. The interviews were done semi-formally, right after the educational leaders answered the questionnaires.

43.2.3 Data Analysis Procedures

The data were rendered into a form that would allow for both quantitative and qualitative analysis procedures. The data obtained were analysed according to the questionnaire items, and the themes that emerged, both quantitatively and qualitatively. The data obtained from the first two parts of Questionnaire A and all the parts in Questionnaire B were analysed quantitatively using the Statistical Package for the

Social Sciences (SPSS) software (version 11.5). Qualitative conclusions would then be drawn from the quantitative analysis. The third part of Questionnaire A were analysed both quantitatively and qualitatively. The data obtained here were analysed mostly in a qualitative manner. The data were categorized according to a number of themes related to the Instructional Leadership theory.

43.2.4 Theoretical Framework

This study employs Instructional Leadership Theory as its theoretical framework. The investigation will focus on the factors in the use of blogs that can help educational leaders improve students' motivation to learn English literature at the lower secondary level in schools. Instructional Leadership approach also highlights affective factors, such as monitoring, framing and developing school goals, supervising and evaluating instruction, and communicating the school goals to teachers, students, and parents (Hallinger and Murphy 1985). These aspects form the basis and themes for analyzing the participants' responses.

43.3 Results and Discussion

The findings of the study were analysed through the following sub-sections, which represent the aspects specified in the research questions earlier:

43.3.1 The Factors in the Use of Blogs That Might Help Educational Leaders to Improve Students' Motivation to Learn English Literature at the Lower Secondary Level in Schools

Sixty percent of the respondents agreed that blogs can help to set a platform to promote a community of learners, as what was claimed by Nguyen (2006). This is also consistent with the claim made by Cayzer (2004) and Rosenbloom (2004, as cited in Engebretson 2011), that blogging has also been claimed to be an influential tool in establishing as well as maintaining online groups or communities. However, 20 % of the respondents disagreed, while another 20 % were not sure that blogs can become a platform to promote a community of learning. This might be due to the lack of students' support towards the programme in their respective schools.

All of the respondents also agreed that blogs can "act as a tool of communication". This clearly shows that all of the respondents felt that blog is a very useful tool for communication. This is consistent with the claim by Ward (2006), that

blogs are an effective mode of communication. This point is also supported by Richardson (2006, as cited in McPherson et al. 2007), who claims that one of the benefits of a blog is that it promotes discussion and communication among users. This demonstrates how blogs can handle large scale discussions among users, thus assisting educational leaders in their management.

Besides that, 70 % of the respondents agreed that blogs can help in “communicating the school goals to teachers and students”. None of the respondents disagreed with this function of blogs. This shows that blogs were used actively by most of the respondents to make sure their school communities were well aware of the goals and objectives of their organization. As stated by Hallinger and Murphy (1985), such use of the blogs is definitely one of the criteria of an instructional leader.

The findings also show that 90 % of the respondents agreed that blogs are useful to “inform students of class requirements, post handouts, notices, and homework assignment”. This function might probably help leaders to ensure that students get the latest information, which may directly attract their interest to learn. The 90 % of the respondents also agreed, while only 10 % were not sure that blogs can “act as a question and answer board.” This is consistent with the claim by Nguyen (2006), that blogs can be used to inform students about all things related to their lessons. The findings show that 90 % of the respondents agreed that blogs can be used to “save time to spread information, and thus, makes the students more motivated as they do not need to wait for information”.

Other than that, the findings show that 100 % of the respondents agreed that blogs can be used to “mentor and provide feedback for the students and teachers”. This is consistent with the claim by Nguyen (2006), that blogs make it possible for educational leaders to make online mentoring and ongoing learning possible. These functions can allow leaders to observe students' interactions in ensuring that effective learning is taking place. From the findings, it is proven that giving feedback to students is another possible utilization of blogs among educational leaders. As reiterated by Brown (1994), by getting feedback from the educational leaders, the students will have more motivation to learn English Literature. Besides that, the findings show that all of the respondents agreed that blogs can be used to “observe students' communication and interactions, as well as their performance”. This shows that other than monitoring teachers, blogs can also be used to monitor and observe students.

Furthermore, the findings show that 70 % of the respondents agreed that blogs can be used to “keep students' work as digital portfolios”. This is parallel to Lin and Yuan's (2006) reiteration that blogs provide a more ready record of learning, thinking, and working (Beeson 2005). As mentioned earlier, this might be due to the public nature and comment feature of blogs. The public nature of blogs may force many students to make an effort to be more careful with their writing as they have a lot of readers (Borja 2005). Peer pressure might also potentially motivate many students to take extra care in editing their articles prior to posting.

Besides that, the findings show that 80 % of the respondents agreed that blogs can be used to “monitor teachers' teaching process”. This is consistent with the role of an instructional leader and teachers to monitor systematically and continuously

(Hallinger and Murphy 1985). This ensures that the quality of teaching and learning is always at an optimum level. The consistency of quality of the learning process might potentially be a factor that can increase students' motivation to learn English Literature. Only 10 % of the respondents were not sure about this function, probably because they found it easier to monitor teachers manually.

In addition, the findings also show that 90 % of the respondents agreed that blogs can be used to "help them to motivate shy and passive students". This finding is in line with what is stated on Blogger (2009), that blogs provide opportunities for people to voice out their views and connect with people of different backgrounds (Richardson 2003).

To sum it up, the majority of the respondents show positive results and agreed with all the items tested: blogs' potential to become a platform to promote a community of learners; act as a tool of communication; communicate the school goals to teachers and students; inform students of class requirements, post handouts, notices, and homework assignment; act as a question and answer board; help educational leaders to mentor and provide feedback for the students and teachers; help educational leaders to observe students' communication and interactions, as well as their performance; keep students' work as digital portfolios; help educational leaders to monitor teachers' teaching process; using blogs to motivate shy and passive students; connect with other educational leaders to learn more about motivating students; and the easiness of blogs to be created. These results strongly show that blogs can really help educational leaders to improve students' motivation to learn English literature at the lower secondary level in schools.

43.3.1.1 Instructional Leaders' Reflections on the Factors in the Use of Blogs That Might Help Educational Leaders to Improve Students' Motivation to Learn English Literature at the Lower Secondary Level in Schools

The findings for this particular aspect are extracted from the interviews conducted. The first question (Q1) was "Do you think blogging has supported your practice as an educational leader? How?" From this finding, the 90 % of the respondents agreed that blogging has supported their practice as educational leaders. Only one respondent had mixed opinions and answered both, "Yes" and "No" for the first question (Q1). After analyzing the reasons stated, all of the reasons can be divided into two major categories: (1) for monitoring purposes; (2) for communication (Fig. 43.1).

As for the first category, which is "for monitoring", the respondents claimed that blog has supported their practice to "check on the students and teachers", "keep track of both students' and teachers' activities", "manage both teachers and students better", "manage students' learning and teachers' role in learning in the whole school", "make sure that teachers are doing their work" and "monitor teaching and learning process". This function of blog for monitoring teachers and students is again in line with the claim by Nguyen (2006), that blogs have the ability to make online mentoring and monitoring possible. This is also consistent with the role of an instructional leader to systematically and continuously monitor teaching and learning.

Fig. 43.1 Categories for the responses for Q1

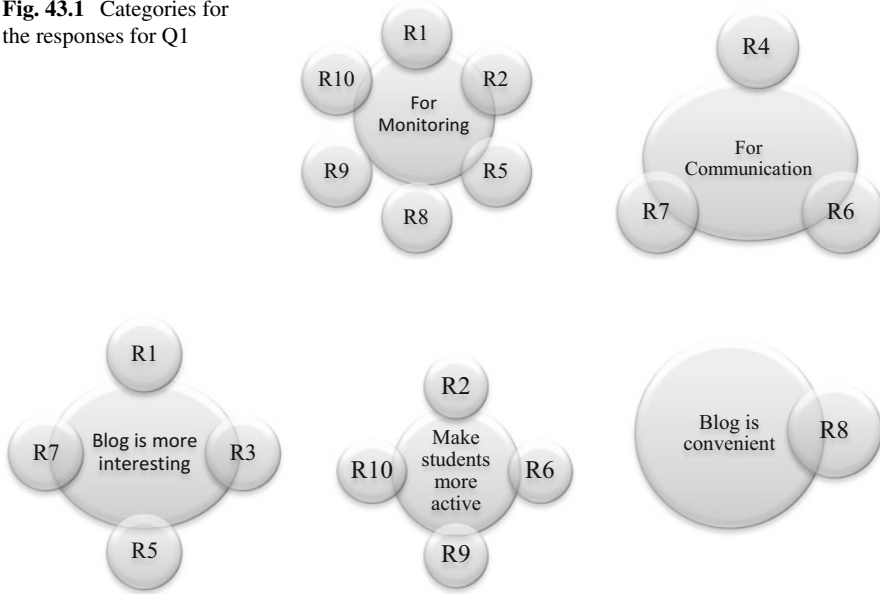


Fig. 43.2 Themes for the responses for Q2

As for the second category, which is “for communication”, the respondents claimed that blogs have supported their practice to “communicate with everyone”, “easy to give feedback” and “to be more informed of English teachers’ and students’ and learning experience”. This is in line with the claim by Ward (2006), that blogs promote an effective way of communication for all kinds of communities. This point is also supported by Richardson (2006, as cited in McPherson et al. 2007), who claims that one of the benefits of a blog is that it promotes discussion and interaction among users. This finding is also parallel with the fact that blogs allow communication to be conducted with greater ease and interest, as postulated by Elola and Oskoz (2008).

The second question (Q2) was “Do you think the blog managed to increase students’ motivation to learn English Literature? Give reason/s.” From this finding, the majority (90 %) of the respondents agreed that blogging managed to increase students’ motivation to learn English Literature. Only one respondent disagreed and answered “No” for the second question (Q2). After analyzing the reasons stated, all of the reasons can be divided into three major themes: (1) blog is more interesting; (2) make students more active and; (3) blog is more convenient (Fig. 43.2).

For the first theme, which is “blog is more interesting”, the respondents claimed that blog managed to motivate students to learn English Literature as “they are sick of books”, “students love ICT”, “students like blogs” and “students love anything related to ICT”. This directly proves that blogs are very effective in attracting, as well as motivating students to learn. Since most students nowadays are very familiar with the use of ICT, they prove to be more inclined to use it, especially for the learning process. Therefore, it is now obvious that blogs can help educational leaders to

motivate the students, especially for studying English Literature. The respondents' answers are consistent with Alexander's (2006, as cited in Valenca 2006), reiteration on blogs' ability in developing public discussion and Regan's (2008) explanation on blogs' interactive features.

Referring to the second theme, which is "make students more active", the respondents claimed that "students are more willing to talk about English Literature learning in class", "many shy students contribute a lot of ideas and comments online", "the use of blogs that they are familiar with increase students' participation", "the students participated more actively in English Literature lessons compared to typical lessons in classroom", many left comments and ask a lot of questions on the blog" and "excited if teachers post a lot of new stuff online daily". From these findings, based on the respondents' observations, blogs could really help to make students more active in learning English Literature. This will in turn improve the quality of education and motivate students, especially students who are passive and shy. This is in line with the claim by Beeson (2005) and Freinet (1969, as cited in Warschauer and Meskill 2000) that blogs might probably be useful as blogs allow active contribution of ideas on a platform that is highly accessible by all.

With regard to the third theme, which is "blog is convenient", the respondents claimed that "through blogging, teachers can upload pictures, videos and other interesting materials online" and "students can learn anywhere anytime". This is in line with the claim by De Almeida Soares (2008), that most blog platforms offer the possibility of uploading PowerPoint presentations, photos, slide shows, audio and video resources, which make blogs even more attractive.

The third and the last interview question (Q3) was "Does the use of class blog make it easier/harder for you to manage students' learning of English Literature? Please provide reason/s". Seventy percent of the respondents answered "easier" while three (30 %) respondents answered "harder". Some of the reasons given were "I can check students' learning on a daily basis" and "not just limited to class time and working hour". However, 30 % of the respondents who claimed that blogs made it harder for them to manage students' learning of English Literature stated a few reasons such as "difficult when there is technical problem", "many students were only active blogging when it was first introduced", and "the internet at school is unreliable". These problems probably aroused due to ICT facilities in schools involved are not properly maintained, and thus complicate the management process using ICT. In terms of students' lack of motivation to continue using blog, this might be due to the lack of maintenance or maybe the blogs were rarely updated.

Other than that, some respondents claimed that blogs provide "a ready record of students' participation and performance online, that can't be lost", and "all of the students' activities can be checked on one page". This finding shows that the ability of blogs to store data and display the data in orderly manner can really facilitate educational leaders in their management.

Besides that, the respondents found that blog did not cause them much trouble as "the Internet is readily available" and "most of the students in the school have easy access to the internet". With ICT facilities that are easily accessible, educational leaders and students can communicate on a continuous basis.

In brief, the majority of the respondents (educational leaders) agreed that blogging had supported their practice as educational leaders. Other than that, the majority of the respondents (educational leaders) also agreed that blog managed to increase students' motivation to learn English Literature and make it easier for them to manage students' learning of English Literature.

43.3.2 The Challenges That Entail from the Use of Blogs in Educational Management

The findings show that 80 % of the respondents agreed that one of challenges that educational leaders, teachers and students have to face when using blog is "lack of access to appropriate ICT equipment". The findings also show that 80 % of the respondents agreed that one of challenges that educational leaders, teachers and students have to face when using blog is "unreliable equipment". This is in line with the BECTA Report (2003) which identified lack of access to appropriate ICT equipment is one of the difficulties of using ICT in schools. This situation may occur in low socioeconomic areas or in schools that have small funds. In some schools, ICT equipment that was supplied by the ministry was not treated with care until most of it is damaged and unusable.

The findings also indicate that 90 % of the respondents agreed that one of challenges that educational leaders, teachers and students have to face when using blog is "Lack of models of good practice in ICT". Probably, most of these educational leaders did not know to whom they should refer when problems with regard to ICT occur. The findings also show that 80 % of the respondents agreed that one of challenges that educational leaders, teachers and students have to face when using blog is "lack of technical, administrative and institutional support". This is consistent with the BECTA Report (2003) which identified that one of the difficulties of using ICT in school is due to the lack of models of good practice in ICT and lack of technical support. Without adequate technical assistance, it is difficult for educational leaders to carry out their tasks and duties in their busy schedule.

The findings also show that 70 % of the respondents agreed with the claim by the BECTA Report (2003) that one of challenges that educational leaders, teachers and students have to face when using blog is "fear of embarrassment in front of pupils and colleagues, loss of status and an effective degrading of professional skills". This signifies that some educational leaders, teachers and students have problems with their confidence in handling ICT technology. Perhaps, to avoid their colleagues, friends or students from knowing their weaknesses in dealing with ICT technology, they tend to avoid using these technologies in their management, teaching or learning. Eventually, these educational leaders, teachers, and students will have a negative perception towards the use of ICT as a whole. This is proven relevant as the BECTA Report (2003) claims that one of challenges that educational leaders, teachers and students have to face when using blog is "negative attitudes towards ICTs in education". Based on the data, this group may consist of educational leaders and

teachers who are older. The age factor may cause them to feel reluctant to use blogs for a change. This finding reflects that there is truth in the claim stated in the BECTA Report (2003), i.e. one of challenges that educational leaders, teachers and students have to face when using blog is the “fear of change”.

All educational leaders from this study also thought that one of the challenges that hinders educational leaders, teachers and students from using blog is the lack of ICT training. The findings show that 100 % of the respondents agreed with the claim by the BECTA Report (2003) that one of challenges when using blogs in education is “lack of time for training, exploration and preparation”. The findings also show that 100 % of the respondents agreed with the claim by Higgs (1997, as cited in Kipsoi et al. 2012) that one challenge that educational leaders, teachers and students have to face when using blogs is “lack of time — for both formal training and self-directed exploration and for preparing ICT resources for lessons”. Due to time constraints, many educational leaders, teachers and students do not have enough knowledge to optimize the use of ICT. This factor can also be seen from the claim by Tee (1993, as cited in Kipsoi et al. 2012) which specifies that one of challenges that educational leaders, teachers and students face when using blogs is “lack of the knowledge necessary to enable them to resolve technical problems when they occur”. This will eventually affect their self confidence in using ICT.

It can be seen from the findings that 60 % of the respondents agreed with the claim by Venkatesh and David (2000, as cited in Kipsoi et al. 2012) that one of challenges that educational leaders, teachers and students have to face when using blog are the “lack of personal change management skills”, and 60 % of the respondents showed the same result for the claim by Cambell and Sellbom (2002, as cited in Kipsoi et al. 2012) that one of challenges that educational leaders, teachers and students have to face when using blog is the “lack of motivation to change long-standing pedagogical practices”. Some educational leaders, teachers and students have problems to make changes. Perhaps some of them are more comfortable doing things their way, or probably they think that it is too difficult to change. The findings show that 70 % of the respondents agreed with the claim by Yang (2003, as cited in Kipsoi et al. 2012) that one of challenges that educational leaders, teachers and students have to face when using blog is the “perception of ICTs as complicated and difficult to use”. Educational leaders, teachers and students who do not get enough guidance will most probably give up.

An independent-samples *t*-test was conducted to identify the differences or similarities of results between the secondary schools in the urban areas and the secondary schools in the rural areas. This is to study whether the difficulties experienced in the process of using the blog to learn English Literature in the urban areas are the same with the ones in the rural areas. The findings show that the results for the two conditions (urban and rural), i.e. the challenges that entail from the use of blogs, are almost relatively the same.

From the results, only two items statistically show slightly significant difference between the two conditions (urban and rural). The first item that showed

significant difference is item 14 – lack of access to appropriate ICT equipment. From this finding, it can be concluded that this particular challenge that entail from using blog happens more in the rural areas. This is likely due to the fact that the schools in the urban areas experience shortages of ICT facilities lesser than the schools in rural areas. Many educational leaders, teachers and students in urban areas are also more able to have their own ICT equipment than those in rural areas. This difference may be attributed directly to the socio-economic differences between urban and rural areas.

The second item that showed significant difference is item 24 – fear of embarrassment in front of pupils and colleagues, loss of status and an effective degrading of professional skills. From this finding, it can also be concluded that this particular challenge that entails from using blogs happened more in the rural areas. This occurs probably because the level of confidence in handling ICT tools for users in urban areas is higher. Overall, the results obtained from the *T*-test that was conducted to see the differences/similarities between the challenges in the schools in the urban areas and the schools in the rural areas show that the results for the two both urban and rural areas are relatively the same.

In short, the majority of the respondents showed positive results and agreed with all the items tested: lack of access to appropriate ICT equipment; lack of time for training, exploration and preparation; lack of models of good practice in ICT; negative attitudes towards ICTs in education; fear of change and a lack of personal change management skills; unreliable equipment; Lack of technical, administrative and institutional support; lack of time — for both formal training and self-directed exploration and for preparing ICT resources for lessons; lack of self-confidence in using ICT; negative experiences with ICT in the past; fear of embarrassment in front of pupils and colleagues, loss of status and an effective degrading of professional skills; lack of the knowledge necessary to enable me to resolve technical problems when they occur; lack of personal change management skills; lack of motivation to change long-standing pedagogical practices; and the perception of ICTs as complicated and difficult to use. Although the majority of the educational-leader respondents agreed that these problems might occur when using blogs in their management, the previous section shows that the majority of them still thought that blogs could really help them to motivate students to learn English Literature.

43.3.3 The Relationship Between the Uses of Blogs with the Increase of Malaysian Lower Secondary Students' Motivation to Learn English Literature

The findings show that 83 % of the respondents agreed that they were “more motivated to learn English Literature after studying using blog”. This finding alone shows that blogs can actually help in motivating lower secondary students to learn

English Literature. Other than that, 55 % of the respondents agreed that they “will continue to use the blog to study English Literature.”

Sixty-four percent of the respondents also agreed that they were “not easily distracted when using blog to study English Literature”. Besides that, 87 % of the respondents agreed that “blog helps them to become more active in contributing ideas”. These two factors show that the majority of the respondents found that blogs brought more advantages than distractions.

Besides that, 75 % of the respondents agreed that they “receive feedback (comment/s) from my English language teacher/s and school leader/s on my blog entries” and 78 % of the respondents also agreed that the “comment/s received through the class blogs were useful in improving my English Literature skills and motivation”. From these findings, it is proven that providing feedback is of utmost importance to increase students’ motivation to learn English Literature and be more active in the learning process.

Furthermore, 75 % of the respondents agreed that they “enjoyed getting the feedback through the class blogs”. Sixty-eight percent of the respondents also agreed that they were “more active in sharing ideas and become less shy when they use blogs to study English Literature, thus, making them more motivated”. Other than that, 89 % of the respondents agreed that they were “more motivated to learn English Literature because blogs can be accessed anywhere, anytime”. Eighty-seven percent of the respondents also agreed that they were “more motivated to learn English Literature because blogs have audio, picture and video features (more attractive)”.

Other than that, 90 % of the respondents agreed that they were “more motivated to learn English Literature because blogs allow me to share views with friends and public”. Besides that, 84 % of the respondents agreed that they were “more motivated to learn English Literature because blogs gives more freedom to be creative”. Lastly, 85 % of the respondents agreed that they were “more motivated to learn English Literature because blogs give more freedom of expression”.

A Pearson product-moment correlation coefficient was computed to assess the relationship between the frequency of using blog and students’ motivation to learn English Literature. Overall, there was a strong, positive correlation between the frequency of using blog and students’ motivation to learn English Literature. In other words, the more often students use blogs to learn English Literature, the more motivated they will be to learn that subject. This might be because the students who often use the blog will become more adept at using it, as well as be able to optimize the blog’s functions to enhance their performance in English Literature.

All in all, a vast majority of the respondents (lower secondary students) show positive results and agreed with all the items tested: the traditional view of motivation; positive feedback that boosts students’ motivation; blogs ability to facilitate communications and community forming; and the features of blog that can potentially increase students’ motivation to learn English Literature. In conclusion, these findings clearly show that blogs are very effective in motivating lower secondary students to learn English Literature.

43.4 Conclusion

The groundwork of this study was built on the assertion that in order to motivate students to learn English Literature, educational leaders need to play a more proactive approach by taking part actively in the learning process, and by understanding thoroughly students' needs, interests, and affective factors to produce positive impact on their studies. The positive responses by the majority of the participants towards the idea of incorporating class blogs in educational leadership to motivate lower secondary students in understanding English Literature suggest that this new method is worth a try. The findings have provided evidence that there is a parallel relationship between the use of blogs and the increase of students' motivation in understanding English Literature.

As a whole, the findings from this study are parallel to the findings of previous studies that have been reviewed. However, this method is still not proven to be effective in every environment and context. Although in theory, using class blogs might be able to bring many benefits and advantages, many other practical factors need to be taken into consideration. It is hoped that the findings from this study will generate the development of more research on the use of class blogs in educational management, particularly in Malaysian settings. Such research areas are very important in this era and can assist our ongoing efforts towards developing more research discoveries.

References

- BECTA. (2003). What research says about barriers to the use of ICT in learning. Retrieved from www.becta.org.uk/research
- Beeson, P. (2005). Bringing blogs into the classroom: 'New media' platform gaining steam at universities. *Quill Magazine*, 93(6), 27–29. Retrieved from Humanitis Full Text @WilsonWeb
- Blogger. (2009). *What's a blog?* Retrieved from http://www.blogger.com/tour_start.g
- Borja, R. R. (2005, December 14). Blogs catching on as a tool for instruction. *Education Week*, 25(15), 17. Retrieved from ProQuest Education Journals.
- Brooks-Young, S. (2005, October). Writing for an audience: Use blogs to expand your students' horizons. *Today's Catholic Teacher*, 39(2), 10–13. Retrieved from ProQuest Education Journals.
- Brown, H. D. (1994). *Principles of language learning and teaching* (3rd ed.). Englewood Cliffs: Prentice Hall Regents.
- Caverly, D. C., Nicholson, S. A., Battle, J., & Atkins, C. E. (2008, Fall). Techtalk: Web 2.0, blogs, and developmental education. *Journal of Developmental Education*, 32(1), 34–35. Retrieved from ProQuest Education Journals.
- Cayzer, S. (2004). Semantic blogging and decentralized knowledge management. *Communications of the ACM*, 47(12), 47–52.
- Cohen, L., & Manion, L. (1980). *Research methods in education*. London: Routledge.
- De Almeida Soares, D. (2008). Understanding class blogs as a tool for language development. *Language Teaching Research*, 12(4), 517–533. Retrieved from ProQuest Education Journals.
- DeBevoise, W. (1984). Synthesis of research on the principal as instructional leader. *Educational Leadership*, 41, 14–20.

- Ellison, N. B., & Wu, Y. (2008). Blogging in the classroom: A preliminary exploration of student attitudes and impact on comprehension. *Journal of Educational Multimedia and Hypermedia*, 17(1), 99–122. Retrieved from ProQuest Education Journals.
- Elola, I., & Oskoz, A. (2008, Fall). Blogging: Fostering intercultural competence development in foreign language and study abroad contexts. *Foreign Language Annals*, 41(3), 454–477. Retrieved from ProQuest Education Journals.
- Engelbreitson, R. M. (2011). *Principals and Blogs: In what ways does blogging support the practices of school principals?* Retrieved from http://conservancy.umn.edu/bitstream/101516/1/Engelbreitson_umn_0130E_11742.pdf
- Hallinger, P., & Murphy, J. (1985). Assessing the instructional leadership behavior of principals. *Elementary School Journal*, 86(2), 217–248.
- Hunt, N., & Barnes. (2006). *The use of ICT in the assessment of modern languages: The English context and the wider European background*. Paper presented at the British Educational research association annual conference, University of Warwick, 6–9 September 2006. Retrieved from <http://www.leeds.ac.uk/educol/documents/157251.html>
- Kaur, S., & Thiyagarajah, R. (1999). The English reading habit of ELLS students in University Science Malaysia. Retrieved from <http://ultibase.rmit.edu.au/Articles/may00/thiyag.htm>
- Kipsoi, E. J., Chang'ach, J. K., & Sang, H. C. (2012). Challenges facing adoption of Information Communication Technology (ICT) in educational management in schools in Kenya. Retrieved from <http://www.macrothink.org/journal/index.php/jsr/article/view/1882>
- Kulanz Salleh. (2010). Kepentingan Teknologi Maklumat (ICT) Dalam Membantu Pengurus Melaksanakan Fungsi Kepimpinan. Retrieved from <http://kulanzsalleh.blogspot.com/2010/03/kepentingan-teknologi-maklumat-ict.html>
- Kuzu, A. (2007). Views of pre-service teachers on blog use for instruction and social interaction. *Turkish Online Journal of Distance Education-TODJE*, 8(3), 34–51.
- MacBeath J., Oduro G., & Waterhouse J. (2005). Distributed leadership: A developmental process. *ICSEI 2005 18th International Congress for School Effectiveness and Improvement*.
- McPherson, S., Wang, S.-K., Hsu, H.-Y., & Tsuei, M. (2007, September/October). New literacies instruction In teacher education. *TechTrends*, 51(5), 24–31. Retrieved from ProQuest Education Journals.
- Nguyen, T. (2006). *The use of blogs in education*. Retrieved from http://thanhnghuyen75.blogspot.com/2006/11/use-of-blogs-in-education_14.html
- Regan, B. (2008, July/August). Why we need to teach 21st century skills – And how to do it. *Multimedia and Internet @ Schools*, 10–13. Retrieved from ProQuest Education Journals.
- Richardson, W. (2003, September). Web logs in the English classroom: More than just a chat. *The English Journal*, 93(1), 39–43. Retrieved from JSTOR.
- Richardson, M., Prickett, R., Martray, C., Cline, H., Ecton, G., & Flanigan, J. (1989). *Supervised practice: A staff development model for practising principals*. Paper presented at the annual meeting of the national council of statistics on inservice education, San Antonio, TX (ERIC Document Reproduction Service No. ED 314861).
- Valenca, J. K. (2006). Blogs and wikis in the classroom. *Information Searcher*, 16(1), 3–8. Retrieved from Humanities Full Text @WilsonWeb.
- Ward, R. (2006). Blogs and wikis: A personal journey. *Business Information Review*, 23(4), 235–240.
- Warschauer, M., & Meskill, C. (2000). *Technology and second language teaching*. Retrieved from <http://www.gse.uci.edu/markw/tslt.html>

Chapter 44

Secondary School Students' Knowledge and Awareness on Environmental Issues

Muhamad Furkan Mat Salleh, Nurul Hanis Mohd Zuki,
Mohamad Hisyam Ismail, and Nabilah Abdullah

Abstract Chemistry can be used as a medium to integrate environmental issues, inculcate environmental awareness also as a platform to assess students' knowledge and awareness on environment. This study is designed to find out secondary school students' knowledge and awareness on environmental issues. It employs a qualitative approach in which data are primarily gathered through observations and interviews. Observations of students' attitudes were carried out in the classroom and laboratory while teaching and learning took place. As for the interviews, the process involved two different groups of samples namely students and chemistry teachers to support the data gathered through observations. Based on their green practices reflected through their daily routines, the secondary school students were found to possess substantial knowledge on environmental issues and good attitudes towards the environment. However, they have moderate awareness on environmental issues examined through their knowledge and attitudes. It is recommended that chemistry teachers integrate environmental issues and promote environmental awareness as they teach any related chemistry topics given the significant role of knowledge integration in fostering environmental literacy among students.

Keywords Environmental awareness • Environmental literacy • Teaching and learning chemistry

44.1 Introduction

The quality of our environment has deteriorated to a worrisome level as news about the degradation inflicted to the environment are frequently reported in the mass media. The seriousness of the situation is apparent with the occurrences of numerous environmental problems worldwide such as greenhouse effects, global

M.F.M. Salleh (✉) • N.H.M. Zuki • M.H. Ismail • N. Abdullah
Science Education Department, Faculty of Education, Universiti Teknologi MARA,
Section 17 Campus, 40200 Shah Alam, Selangor, Malaysia
e-mail: furkan@salam.uitm.edu.my

warming, climate change, acid rain and pollutions. One contributing factor for the rise of such issues is human negligence towards the environment. However, there are still those who take the initiative to conserve and preserve the environment with others who promote environmental awareness among society. Unfortunately, the outcomes of their efforts are not immediate and apparent. On the emerging predicament, scientists continuously put their best efforts to identify effective ways to sustain the environment. Through various studies, debates and discussions, they found that one of the ways to sustain the nature is through the medium of education. Trumper (2010) claims education is the most significant platform for future citizens to confront and deal with current and emerging environmental issues.

In addressing environmental issues, it is imperative to begin with the young generation as they are the ones who will inherit and safeguard the survival of the Earth. Hence, focus should be given to ensure that future generations are well informed, educated and committed to sustaining, conserving, and preserving the environment. For that reason, teachers are among the people who are responsible to develop students' environmental awareness in the classroom. In Malaysia, efforts to inculcate environmental awareness on younger generations have been carried out through the introduction of Environmental Education (EE) and Education for Sustainable Development (ESD) programs over a decade ago. These programs are in-line with the National Policy on the Environment 2002 under 'Education and Awareness' (Karpudewan and Ismail 2012a). Both programs were conducted in all primary and secondary schools, with the aim to create an eco-friendly community, that are well-equipped with knowledge, skills and values on environmental issues and can find solutions if problems arise. These two programs however, were aborted due to lack of practicality and their ineffectiveness in inculcating environmental knowledge and awareness.

As a result, the direction was changed to science, a subject believed to be most relevant for the integration of environmental issues during teaching and learning processes based on the strong relation between some science content or topics to environmental issues. Chemistry for instance, can be used as a tool to raise students' awareness towards conserving and preserving the environment. One of the ways Chemistry can help foster awareness among students is by incorporating authentic issues like chemical spills, acid rain and river pollution into existing syllabus. In a subtle way, students who learn Chemistry can benefit greatly when environmental issues are linked to the science behind them. Practically, Chemistry educators should not have any problems fostering environmental awareness among students. Unfortunately, not all Chemistry teachers make the efforts to include environmental issues in their discussions and teaching partly due to time constraint, selective teaching of content, and focus on didactic teaching towards ensuring students score in the public examination.

Various studies conducted at secondary and tertiary institutions in Malaysia revealed that students, regardless of their education standards, generally have moderate level of awareness on environmental issues despite most having good level of environmental knowledge (Mohamed Osman et al. 2011; Harun et al. 2011; Hassan et al. 2011). This

scenario suggests that efforts taken to produce sustainable generations have yet to be enhanced. As Malaysia progresses towards becoming a developed nation, efforts in creating future generations with high environmental knowledge and awareness deemed to be given due priority. Therefore, the researchers believe that there is a need to carry out a study that has the following objectives:

- (i) to determine the knowledge and awareness of environmental issues among secondary school students, and
- (ii) to find out teaching methods that could enhance students' awareness on environmental issues in learning chemistry.

Based on the above mentioned objectives, the study hence, aimed to answer the following questions:

- (i) What is the level of knowledge and awareness of environmental issues among secondary school students?
- (ii) How teacher can enhance students' awareness on environmental issues in learning chemistry?

44.2 Review of Related Literature

This section contains related literature of the study in which includes the review on students' knowledge and awareness on environmental issues and educational efforts conducted in promoting environmental awareness in Malaysian schools.

44.2.1 Students' Knowledge and Awareness of Environmental Issues

Enhancing students' knowledge and promoting awareness towards the environment is very crucial since the world has come to face various environmental problems. These environmental problems pose a threat to environmental sustainability, contributing to increasing level of wastes, air pollution, ozone layer depletion, global warming and many more. Environmentalists assume that through environmental awareness, polluted environment can be minimized and thus promote sustainable use of resources (Ali and Sinha 2013). In a study conducted on environmental awareness revealed that students in developing countries show a moderate level of awareness on environmental issues, are actively involved in environmental issues, demonstrate interest to learn about environmental topics and possess enthusiasm to work with environmental protection agencies as their future job (Trumper 2010). Meanwhile, secondary school students in Mathura, India and Karachi, Pakistan depicted a moderate attitude towards environmental issues (Bhatnagar 2012; Yousuf and Bhutta 2012) while students in Estonia schools display good environmental

awareness when they were asked basic questions about environmental issues but have insufficient knowledge about complex environmental issues (Pata and Metsalu 2008). On the contrary, students at an eco-school in Slovenia showed a low level of environmental awareness which was discovered through their difficulty in answering questions related to awareness (Krnel and Naglic 2009). In another study conducted on Bruneian students about global warming indicated they have sound knowledge on the issue and are aware about the occurrence of this problem, but they did not have any idea why people should be concerned about global warming (Tan et al. 2012). A survey conducted on 15 years-old students found that they are highly concerned about environmental pollution issues but less concerned on nuclear waste issues (OECD 2009) because pollution happen in local context whereas the nuclear waste issues occur globally (Buchanan and Griffin 2010).

In Malaysia, Lim Siaw Fong's (2005) study in two Selangor schools revealed that students' general knowledge about the environment was high, but their understanding of environmental issues and identification of environmental problems was superficial. Awareness and sensitivity towards environmental issues were also found to be low. Furthermore, when it came to action, the respondents preferred conservation practices which involve little efforts such as switching off fans, but did not commit to actions like bringing own bags when shopping and doing their groceries. Aini Mat Said et al. (2007) studied the environmental awareness among 306 students who were randomly selected from four different schools in Johor. They found that students have knowledge on several local environmental issues but lack involvement in sustaining consumption practices. Another survey conducted on primary school students in rural school in Hulu Selangor found that majority of the students are aware of environmental problems but only those that are commonly occurring in Malaysia such as land, water, and air pollutions. They were, however, less discerning of advanced environmental issues like ozone depletion, acid rain, and global warming (Said et al. 2011). Findings from another study had shown that secondary school students in Sabah have a moderate level of knowledge on current environmental issues in Malaysia which can be observed when students were unable to respond well when questions related to the climate change and carbon dioxide were put forward (Harun et al. 2011).

Similarly, students at the tertiary level were moderately concerned about environmental issues (Mohamed Osman et al. 2011). In the study conducted by Arbaat Hassan et al. (2011), tertiary students in UKM portrayed a high level of knowledge, awareness and attitude towards the environment but a moderate level of environmental practice. It can generally be concluded that Malaysian students have sound knowledge on the environment, but a moderate level of awareness of environmental issues. Lack of awareness on several issues among students in Malaysia may be the outcome of examination-oriented education system requiring them to memorize facts instead of in-depth understanding of issues (Karpudewan et al. 2013). Besides that, Incekara et al. (2011) reported that lack of students' knowledge on environmental issues are due to lackadaisical attitudes and little interest to read about environmental problems occurring in their neighborhood.

Meanwhile, Abdul Aziz Shamsuddin (2003) reported that there was no significant correlation between the students' conceptual understanding of the environment and their willingness to protect the environment. For instance, an individual may be aware of the importance of recycling to reduce solid waste disposal and to avoid depletion of resources, but he might not engage in recycling activities. Hence, although students were familiar with recycling activities and their knowledge on recycling concept were creditable, these activities were rarely done by them (Said et al. 2011). In addition, Omran and Gebril (2011) also reported the same finding in which only half of the primary school students participated in recycling activities despite all indicated that recycling is very essential. To promote environmental awareness and pro-environmental behavior, there is a need to disseminate knowledge and information regarding environmental issues (Asunta 2003). All the above arguments clearly suggest that Malaysians need to adopt more environmentally conscious habits.

44.2.2 Educational Efforts Conducted in Promoting Environmental Knowledge and Awareness

One of Malaysia's educational efforts carried out to provide knowledge and foster environmental awareness among the young generation is through the Environmental Education (EE) program. It has been embedded in the school curriculum worldwide ever since the world is confronted with increasing number of environmental issues. In Japan, the implementation of EE focuses on three purposes targeted to all citizens and organizations. The purposes of EE in Japan are to promote environmental awareness, to have a wide understanding of the roles and duties of an individual towards his or her surroundings and to actively involve in environmental conservation activities while finding ways to curb environmental problems (Pudin et al. 2002). The successful implementation of EE in Japan is evident based on the cleanliness of the country and the citizens' attitudes towards their environment. In Malaysia, EE was once used as a medium to nurture sustainable development (SD), and throughout the implementation, EE was observed to have potentials in providing understanding and knowledge about our surrounding (Pudin et al. 2002). Among all subjects in the Malaysia school curriculum, science subjects seem to be the most relevant to be applied with Sustainable Development Concepts because of the mutual relationship between the contents of science subjects with the environment (Sharifah Intan Sharina Syed Abdullah et al. 2011). Other scholars also believe that science students have higher environmental awareness as compared to students from other streams hence, they are more connected to their surrounding (Arbaat Hassan et al. 2011). To determine the scope of environmental knowledge in the national curriculum, Sharifah Intan Sharina Syed Abdullah et al. (2011) analyzed the contents of Biology, Physics and Chemistry against a checklist provided by Hungerford and Peyton (1994). The purpose of the checklist is to examine whether

environmental knowledge is integrated into every content subject (Sharifah Intan Sharina Syed Abdullah et al. 2011). The research findings showed there are not much of environmental knowledge incorporated in the Chemistry syllabus.

To overcome the shortcomings, Nooraida Yaakob et al. (2012) proposed in their study on the integration of environmental knowledge through inclusion of one environmental issue in the Chemistry lesson to foster environmental awareness among students. However, a local study carried out on the integration of EE in the science subjects is found to be at a superficial level (Sharifah Intan Sharina Syed Abdullah et al. 2011). In spite of the fact that it is not thoroughly incorporated, scholars found that secondary school students possess a high level of environmental knowledge, awareness and positive attitude towards environmental problems (Amirad et al. 2012; Agnes and Abd Rahim Md Nor 2011). This contradiction arise due to various factors such as the family institution, teachers, media, private readings on educational materials and school curriculum activities that have contributed towards positive results (Amirad et al. 2012; Agnes and Abd Rahim Md Nor 2011). Additionally, adequate facilities provided in Malaysian schools also assist teachers to become more competent in teaching EE which led students to have good environmental awareness, knowledge and positive attitude (Agnes and Abd Rahim Md Nor 2011).

44.3 Methodology

For the purpose of data collection, two chemistry classes were purposefully selected. Each of the Form 4 classes consisted of approximately 40 students. Data were gathered qualitatively via classroom observations, and interviews with five in-service chemistry teachers and ten selected students. In addition to interviews, field notes on classroom observations were also noted down. Following are the descriptions of each event involved in the study and explanation on how the methods have been carried out.

44.3.1 Classroom Observation (Teaching)

In the study, one of the researchers participated by being the respondents' teacher. All observations took place in the classroom and laboratory.

44.3.1.1 A Story A Day

'A Story A Day' was one of the methods used by the researcher to collect data. 'A Story A Day' was employed mainly in Chap. 4 of the Chemistry subject. In this chapter, students need to learn about elements in the Periodic Table. While learning

about elements in the Periodic Table, students were not only introduced to the applications of the elements in their daily life, but also taught the consequences resulted from misuse of the elements. This method – which is like storytelling but does not involve any instructional aids – was carried out during the set induction when the researcher introduced new topics to students. 'A Story A Day' began when the researcher asked students to provide examples of applications of elements in their daily life that they knew based on the topics which they were about to learn. After listening to their feedbacks, the researcher then provided students with a story related to the topic. The story was told in-depth to attain students' interests and to encourage participation. This method took about 10 min so that lesson and activities could be conducted as planned. There were several stories told in the class which include the Vietnam War, the application of noble gases in daily life, World War I, volcano eruption and e-waste.

44.3.1.2 Environmental Slide Show and Videos

The second method involved PowerPoint presentations and video viewings of tragedies related to chemicals that are lethal. This method was conducted to exemplify environmental problems that went wrong due to human negligence. In this data collection procedure, the researcher started with a brief explanation of the gas leakage tragedy in Bhopal which resulted in high death toll. This was followed by a 2-min environmental slideshow depicting the immediate and long-term effects of the incident. Students' feedbacks regarding the slide show presentation were obtained by asking their opinions of the tragedy. Two video presentations on Minamata disease and Love Canal strategy followed after the Bhopal showcase. The researcher nonetheless provided brief explanation prior to the video show so that students have general views about the incidents. Each video showing took approximately 10 min, followed by question and answer sessions. The researcher prepared and put forward ten questions for each video show, on which discussions were carried out. The rationale of the discussion was to seek students' opinions regarding the tragedies they recently watched.

44.3.1.3 Classroom Observation (Student Activities)

It is common in any schools that students are likely to forget bringing in their own exercise books, notebooks or A4 paper to write the teacher's notes or for revision purposes. Therefore, the researcher provided students with used paper on which they can write notes for the whole 14 weeks of data collection period. Reuse program was one of the methods used indirectly by the researcher during teaching and learning processes. One activity using reused paper involved getting the students to list out environmental issues and their effects on the society and environment. This activity was conducted to determine the students' level of knowledge and awareness on environmental issues and to subtly highlight the uses of reuse paper. During this

activity, students sat in groups and discussed among their group members while the researcher moved around to attend to students' questions. This activity was conducted for 30 min. Reused paper was also recycled in another activity involving Form 4 classes which include group discussions on the topic of chemical bonds. For the purpose of this activity, students were asked to sit in groups and they were taught one subtopic in the chemical bonds. Next, the researcher asked the representatives from each group to pick one compound and draw the arrangement of the compound on the reused paper provided.

44.3.2 Interview

Interviews were also conducted with two different groups of samples which were students and in-service Chemistry teachers. Hence, appropriate semi-structured interview questions were prepared. The interview sessions with five in-service Chemistry teachers were conducted to find out their opinions of their teaching experiences. For the students, five from each class involved in the observations were conveniently picked. The students were individually interviewed to examine their knowledge and awareness on environmental issues. Generally, each interview lasts between 20 and 40 min, depending on how the samples responded to the questions asked. The interview sessions were documented to provide verbatim support for the visual recording and field notes of the classroom observations.

44.4 Findings

In this section, the discussion focuses on the students' knowledge and awareness of the environmental issues based on data gathered during classroom observations, supported by analysis of interviews conducted on selected students and teachers.

44.4.1 Students' Knowledge on Environmental Issues

As the researchers intended to examine students' knowledge on environmental issues and their effects towards the environment and society, the researchers used various environmental concerns including the haze problem which occurred in Malaysia in June 2013. The questions asked during the interview sessions were similar to the questions posed during the group discussion activity carried out in the classroom. This is because the researchers intended to check the consistency of students' answers in both activities (in group and individually). Most students highlighted common environmental issues and the respective effects on the environment

and society in their interviews, which were consistent with the answers given during group discussion activity. Among the common answers given by the students were:

“...global warming due to greenhouse effect...” “...illegal logging causing landslide...”
“...toxic dumping causes death of aquatic life...” “...water pollution cause death of sea creatures and poison to humans...”

Findings extracted from the group discussion activity and the interviews concerning environmental issues and their effects towards environment and society illustrated comparatively similar results. Therefore, the researchers can conclude that secondary school students generally have substantial amount of knowledge on environmental issues and their effects towards the environment and society.

In relation to current issues, the researchers would like to determine whether students keep informed of the environmental issues that may or may not be happening in Malaysia. The ways they answered the questions will reflect on their level of concern towards the environment. In June 2013, severe haze blanketed Malaysia due to forest burnings in Indonesia, resulting in deterioration of air quality. When asked, majority of the students were alert of the hazy condition and were able to put forward sound opinions on the issue. The following excerpts provided evidences of the students' opinions regarding the issue.

“The haze could have been avoided if irresponsible parties did not burn down the trees, but we can also help it clear faster by not doing anything that will make it more.” (Student E)

“The haze can be very damaging to the human health and it's important that we all learn an important lesson from this – we mustn't be selfish and consider others before committing an act that can lead to hazardous consequences” (Student F)

Apart from the opinions stated above, there was a respondent who wanted to know more about the haze:

“I have asked my teacher about the composition of the haze and she explained that the haze consists of carbon dioxide and monoxide.” (Student A)

The above responses clearly show that students are genuinely concerned with the ecological and environmental changes that took place around them. Such finding contradicts with the findings by Rosta Harun et al. (2011) who reported on their respondents' limited knowledge on current environmental issues despite having been exposed to various environmental awareness efforts. The noteworthy differences in the results obtained are probably due to the samples involved in both studies were from two distinct places notwithstanding at the same educational levels.

Prior researches demonstrated that some of the answers given by the respondents were inaccurate and not in-depth especially on the causes and the effects of the issues (Fong 2005; Tan et al. 2012) and it probably happened due to the minimal exposure towards environmental issues covered in the Chemistry subject as mentioned by Sharifah Intan Sharina Syed Abdullah et al. (2011). The opinions given by the in-service Chemistry teachers supported this claim. They unanimously agree that secondary school students do possess knowledge on environmental issues, and that their knowledge however, is dependent on the depth or coverage provided by

the science teachers. The teachers interviewed also claimed that students are not completely ignorant since they know some of the common environmental issues happening around them as mentioned in the following:

“Some of the students know about environmental problems....” (Teacher B)

“Nowadays students are updated about current issues via the social and media network. It cannot be denied that they also exposed to the news about environmental issues.” (Teacher C)

“...some of them are alert regarding environmental issues and know common knowledge about the environment. They know about the purpose of recycle, reuse, reduce, etc.” (Teacher E)

Interestingly, the teachers expressed that the students displayed their curiosity by being proactive and seek further details on the environmental issues and their effects. They mentioned that:

“Some of the students did ask me about acid rain since they have learned about it in class and they are curious. For example when they learn about the preparation of sulphuric acid, the explanation provided in the textbook is really brief, since they asked I have to explain more” (Teacher A)

“They asked on how Lynas Project affects our environment” (Teacher D)

Upon analysis of data, the secondary school students were deemed as having substantial environmental knowledge; they managed to list most of the environmental issues occurring worldwide such as global warming, thinning of ozone layer, acid rain, various types of pollutions, illegal logging, toxic waste and nuclear radiation which were very much in-line with Aini Mat Said et al.'s (2007, 2011) findings. In addition, some of the students also can provide accurate outcomes and impact of the environmental issues. This situation may have been influenced by various sources like families, teachers, media, casual reading, educational materials and also school activities (Amirad et al. 2012; Agnes and Rahim Md Nor 2011). Even though the students' feedbacks met the objective of the study – to determine students' knowledge on environmental issues – the researchers however reflected on the students' environmental knowledge at a general level. This is because the questions posed by one of the researchers during the interview sessions are rather superficial. For instance, among the questions asked were ‘what are environmental issues that you know of?’ and ‘what are their effects towards the environment and society?’ In comparison to the study conducted by Pata and Metsalu (2008), they used contextual and complex questions to obtain their respondents' opinions regarding the environment.

44.4.2 Secondary School Students' Awareness on Environmental Issues

In the study, the researchers had experimentally used three strategies namely ‘A Story a Day’, environmental slideshows and videos, and students' activities to embed environmental issues and awareness through the teaching and learning of

Chemistry. Through the strategies, students' views and their reactions on the issues were observed providing some insights to the researchers in examining the students' environmental knowledge and awareness. When the researchers conducted 'A Story A Day' and used the environmental slide shows and videos during teaching and learning, the following observations were noted:

- (i) Students participated actively and asked a lot of questions during the sessions since they were never exposed to those stories before;
- (ii) Students who were neither interested to participate nor actively involved during the lesson managed to stay put in their respective seats and listened attentively to the stories being told. Their attentiveness did not only stop there; they also asked a lot of questions to know more about the stories;
- (iii) The use of videos touched the students' emotions as the researcher observed a few female students crying during the video showing while a few others expressing dissatisfaction and anger towards the perpetrator of each incident;
- (iv) There were follow up discussions held by groups of students on the effects of chemicals on human and environment; and
- (v) The activities had triggered some students to look up for more information regarding the tragedies shared in class and they even used the information they gained about the tragedies to have small talk with the researcher on the following day.

The attention given by the students has allowed the researchers to ask several general questions related to the materials shared to examine students' awareness and views. For instance, the researchers asked on the actions that the students will take should they experience similar situations as shown in the slides or videos. Some of the notable responses given were:

- "We as Malaysian need to cooperate to find the solution with the help of Prime Minister to help all Malaysian to overcome these diseases." (Student A)
- "I will not stand still; together we will make sure the perpetrator will be punished by law" (Student D)
- "If we are more aware, we can prevent bad things like pollution from posing threats to our lives" (Student F)
- "Probably, I will speak up and raise a concern among the community" (Student J)

Another question posed to the students was on the necessity to learn Chemistry at secondary school level. The students' reactions vary, among which include:

- "Yes, we can learn everything atom and molecule that effect our health, we can differentiate the good and bad about atom. We also can find cure of disease to overcome the disease." (Student I)
- "Yes, at least I will know the side effect of certain chemical that can affect us in daily life for short-term and long-term." (Student N)
- "Yes, I think it is compulsory so that we can avoid these things from happening in the future." (Student H)

Since reuse paper was utilized in various classroom activities, the researchers noticed that students gradually became more aware of the researcher's efforts to reduce excessive waste of paper. This was evident as students started to pose ques-

tions regarding the purposes of providing reuse paper in almost every class activities. Eventually, they attuned to the practice. One of the methods to identify awareness towards the environment is by looking at an individual's attitude or common practices which can be used as the basis to make judgment. Students' observable behaviours serve as evidence of internalized knowledge and apparent awareness towards environmental issues. Over 14 weeks of the data collection period, students' attitude towards conservation within their environment were noted. One of the students' remarkable actions that the researcher observed was the habit of using reuse paper that they slowly adopted. Although not all students embraced the habit, it was visible that the practice was consistent throughout the duration of 14 weeks with some students. Informal interviews conducted with this group of students revealed their reasons for using used paper which include (i) to save paper especially in drafting homework (ii) to save money, and (iii) to help reduce the number of trees from being cut down. The researchers went on to collect a few samples of students' reused paper as evidence of their willingness to participate in environmental conservation. When the researchers probed the students on what they have done to preserve and conserve the nature, almost all answers reflected positive attitudes towards preserving and conserving the nature. Among the responses given include taking care of their gardens by planting and watering the plants, practicing recycling, and participating in voluntary activities as stated in the following excerpts:

"I have planted a lot of plants and flower around my house for landscaping..." (Student C)

"I watered the plants at my home." (Student D)

"I try to take care of it in any way I can. For examples, I recycle..." (Student E)

"...I even recycled the papers and books in my home." (Student J)

"My household practices recycling and on weekends, we send items to the recycling center.

Also, on the first week of every month, I help out with the sorting of items for recycling near my neighborhood." (Student K)

"...I have also involved in community work to clean the residential park." (Student H)

"... I do charity work like help clean places." (Student A)

"Well, I'm in the school's environment society and during our meeting we will always talk and discuss about how to improve our environment quality..." (Student F)

Two Chemistry teachers who have taught for more than 5 years have also witnessed good attitudes of a small group of students who voluntarily care for their school environment by picking up litter in the school compound. The teachers also mentioned that the number of students who littered are greater than those who are willing to clean up (Incekera et al. 2011; Omran and Gebril 2011). Hence, to conclusively claim that the students have high environmental awareness as mentioned in past studies (Fong 2005; Mohamed Osman et al. 2011; Said et al. 2011; Karpudewan et al. 2013) is unfeasible. This is due to the number of students who really practice environmental-friendly habit, who display care for the environment, and who exhibit awareness of the importance of the environment is observably smaller than those who are not. Nonetheless, it does not nullify the fact that there are students with knowledge on the environment and those who translate the knowledge into pro-environmental behaviors. By looking from a broader perspective, students can be classified as having a moderate level of awareness on environmental issues which were observed through their attitudes towards environment. The findings of this study are in-line with the findings obtained by other scholars (Pata and Metsalu

2008; Trumper 2010; Bhatnagar 2012; Harun et al. 2011; Yousuf and Bhutta 2012). These results are further supported by the opinions gained from the in-service Chemistry teachers who unanimously agree that secondary school students' level of awareness on environmental issues is moderate and should be further enhanced. The conclusion made by those teachers was based on their observations and experiences in their schools. Accordingly, the opinions of the teachers concur with the conclusion made by the researchers.

44.5 Conclusion

In conclusion, this study found that secondary school students have substantial knowledge of environmental issues since they were able to list and explain common and current environmental issues in Malaysia. The term 'substantial' was used to illustrate the level of students' knowledge that is sufficient but it could be further developed or enhanced. In terms of awareness, the study concludes that the secondary school students have moderate level of awareness on environmental issues; this is evident through positive displays of attitudes towards the environment observed via their daily activities or routines such as gardening, recycling, participating in environmental-volunteer program and environmental-based school activities, and reusing used papers to draft their homework. To realize Malaysia's aspiration, Chemistry teachers should be more proactive to incorporate environmental issues in teaching and learning as suggested by Nooraida Yaakob et al. (2012). The inclusion of authentic environmental issues through the methods like story telling, environmental slide show and videos, reusing used paper campaign for instance, proved to have potentials to be further explored and improved in enhancing secondary school students' knowledge and awareness on environmental and consequently bridging the gap of producing sustainable generations.

References

- Abdul Aziz Shamsuddin. (2003). *Conceptual environmental understanding among form 4 Geography students*. Unpublished Master of Education Project Paper. Faculty of Education, University of Malaya, Kuala Lumpur.
- Agnes, M., & Abd Rahim Md Nor. (2011). Implementation of environmental education: A case study of Malaysian and Nigerian secondary schools. In *International Conference on Biology, Environment and Chemistry* (Vol. 1, pp. 324–327). Singapore: IACSIT Press.
- Ali, R., & Sinha, B. (2013). A study of environmental awareness and ecological behaviour among female B.Ed. students. *An International Refereed E Journal*, 2(1), 41–50. ISSN 2278-8433.
- Arbaat Hassan, Norshariani Abd Rahman, & Sharifah Intan Sharina Syed Abdullah. (2011). *The level of environmental knowledge, awareness, attitudes and practices among UKM students*. Retrieved from <http://tree.utm.my/wp-content/uploads/2013/03/THE-LEVEL-OF-ENVIRONMENTAL-KNOWLEDGE-AWARENESS-ATTITUDES-and-practices-among-ukm-students.pdf>
- Asunta, T. (2003). *Knowledge of environmental issues. Where pupils acquire information opinions, and how it affects their attitudes, and laboratory behavior*. Retrieved 23 April 2014 from, <http://www.jyx.jyu.fi>

- Bhatnagar, K. (2012). Environmental awareness among secondary school students in relation to their gender and locale. *International Journal of Research in Economics & Social Sciences*, 2(10), 70–74.
- Buchanan, J., & Griffin, J. (2010). Finding a place for environmental studies: Tertiary institutions as a locus of practice for education for sustainability. *Journal of Teacher Education for Sustainability*, 12(2), 5–16.
- Desmond, T., Chong, I. P. A., & Norhani PGH Buntar. (2012). *Perception of Bruneian students about global warming and its education*. Universiti Brunei Darussalam. Retrieved 15 June 2014 from <http://www.academia.edu>
- Harun, R., Lim, H., & Othman, F. (2011). Environmental knowledge and attitude among students in Sabah. *World Applied Sciences Journal*, 14, 83–87.
- Hungerford, H. R., & Peyton, R. B. (1994). *Procedures for developing an environmental education curriculum* (Series EE 22). Paris: UNESCO.
- Incekara, S., Tuna, F., & Dogan, Z. (2011). Upper primary school Students' perceptions of environmental issues: A case study from turkey. *Ozean Journal of Applied Sciences*, 4(3), 245–250.
- Karpudewan, M., Ismail, Z., & Mohamed, N. (2013). Pre-service Teachers' understanding and awareness of sustainable development concept & traditional environmental concept. *Asian Pacific Journal of Educator & Education*, 28, 117–130.
- Krnel, D., & Naglic, S. (2009). Environmental literacy comparison between ecoschools and ordinary schools in Slovenia. *Science Education International*, 20(1/2), 5–24.
- Lim S. F. (2005). *Environmental management and environmental education in two schools in the Klang Valley*. Unpublished Master of Environmental Technology. Faculty of Science, University of Malaya, Kuala Lumpur.
- Mageswary Karpudewan, & Zurida Ismail. (2012a). Malaysian primary pre-service teachers' understanding and awareness of environmental knowledge, sustainable development – education, business and management – architecture and building construction – agriculture and food security. Prof. Chaouki Ghenai (Ed.), ISBN: 978-953-51-0116-1, InTech. Available from: <http://www.intechopen.com/books/sustainabledevelopment-education-businessand-management-architecture-and-building-construction-agriculture-and-foodsecurity/malaysian-pre-service-teachers-understanding-and-awareness-of-environmental>
- Mohamed Osman, M., Bachok, S., & Ibrahim, A. N. (2011). Chapter 7: The level of awareness towards environmental issues and concern among students in tertiary level: Case study of universities students in Kuala Lumpur and Klang Valley of Malaysia. In *Readers of Environmental Planning in Malaysia* (pp. 59–73). Batu Caves: IIUM Press.
- Omran, A., & Gebril, A. O. (2011). Study of household attitude toward recycling of solid wastes: A case study. *Acta Technica Corviniensis Bulletin of Engineering*, 4, 79–82.
- Organization for Economic Co-operation and Development (OECD). (2009). *Green at fifteen? How 15 year olds perform in environmental science and geoscience in PISA 2006*. Paris: OECD.
- Pata, K., & Metsalu, E. (2008). Conceptualizing awareness in environmental education: An example of knowing about Air-related problem about. *Science Education International*, 19(1), 41–64.
- Said, A. M., Yahaya, N., & Ahmadun, F.-R. (2007). Environmental comprehension and participation of Malaysian secondary school students. *Environmental Education Research*, 13(1), 17–31.
- Said, A. M., Shamsudin, N. A., & Ahmadun, F.-R. (2011). Impact of environmental education on concern, knowledge and sustainable behavior of primary school children. *Environmental Education Research*, 2(1), 50–53.
- Sharifah Intan Sharina Syed Abdullah, Lilia Halim, Edy Hafizan Mohd Shahali. (2011). Integration of environmental knowledge across biology, physics and chemistry subject at secondary school level in Malaysia. *Procedia Social and Behavioral Science*, 15, 1024–1028.

- Susan Pudin, Koji Tagi, & Ambigavathi Periasamy. (2002 February 26). *Environmental education in Malaysia and Japan: A comparative assessment*. Retrieved 22 July 2012, from Centre for Environment Education: <http://www.ceeindia.org/esf/download/paper20.pdf>
- Trumper, R. (2010). How do learners in developed and developing countries relate to environmental issues? *Science Education International*, 21(4), 217–240.
- Yaakob, N., Ismail, Z., & Razak, N. A. (2012). Climate change in the chemistry curriculum for secondary schools: Malaysia context. *International Journal of Global Education*, 1(2), 28–35.
- Yousuf, A., & Bhutta, S. (2012). Secondary school students' attitude towards environmental issues in Karachi Pakistan. *International Journal of Scientific and Engineering Research*, 3(10), 1–11.
- Zarrintaj Amirad, Sharifah Zarina Syed Zakaria, Abdul Samad Hadi, & Mahyar Sakari. (2012). Relationship between awareness, knowledge and attitude towards environmental education among secondary school students in Malaysia. *World Applied Sciences Journal*, 22(9), 1326–1333.

Chapter 45

A Study on Trainee Teachers' Locus of Control: A Case of Universiti Teknologi Mara

Norshidah Nordin, Mubarrak Yusof, Azyyati Zakaria, and Siti Fairuz Dalim

Abstract Trainee teacher's locus of control is an essential characteristic which could be defined as the individual differences variables; however, it has not been much emphasized especially in the local context. Locus of control describes ones' perceptions of how much they can control the circumstances of life, specifically their learning behavior and achievement. Studies showed that effective teacher as a person who has internal locus of control, play important roles in social activities, respectable and have sense of responsibilities. Nevertheless, the challenges of the trainee teachers nowadays are much more intense than decades ago. Besides, in order to be highly marketable in the career domains, trainee teachers need to possess excellent academic performance as well as strong and formidable soft skills. Therefore, this study was intended to investigate the nature of locus of control among the trainee teachers of UiTM, Shah Alam. This study also was intended to examine the differences between locus of control of the trainee teachers according to gender, programs and academic achievement. About 191 respondents participated in this study. A survey method was utilized and it is descriptive in nature. The finding revealed that the trainee teachers were inclined to internality locus of control. There were no significant difference between locus of control according to gender and programs. The practical implications of these findings were discussed in this paper.

Keywords Academic achievements • Externality • Internality • Locus of control

45.1 Background of the Study

Teaching practices has become one of the most influential components in the preparation of pre-service teachers (Graham 2006; Tang 2003). Besides, Richards (2002) stated that teaching practices today are more concerned with teachers' professional

N. Nordin (✉) • M. Yusof • A. Zakaria • S.F. Dalim
Faculty of Education, Universiti Teknologi MARA, Shah Alam, Selangor, Malaysia
e-mail: shidah147@gmail.com

growth, wisdoms, and experiences, context of teaching and political conditions of the environment in which teaching takes place. On that note, Ghonsooly and Rezvani (2012) suggested that the professional development of students' teachers should focus on how they take control of the responsibility of their teaching in the classroom and to what they attribute to their success or failure in their teaching practices. Nevertheless, recent studies showed that teaching practice can have positive and negative consequences on trainee teacher's behavior and also become a foundation of personality and self-confidence (Korthagen et al. 2006; Sabar 2004). Based on these research, it is found that one of the non – cognitive variables that could affect student teachers' behavior and achievement and success is locus of control. The concept of locus of control is referred to one's belief in his or her abilities to control life events and reinforcement that follow behaviour (Strauser et al. 2002). It is an important antecedent personal trait that impacts communication motivation and behaviour. Hence, students who perceive behavioral outcomes as success or failure to be under their control (internal control) should be motivated to engage in academic activities, expend effort and persist in challenging tasks. Studies showed that effective teacher as a person who has internal locus of control, play important roles in social activities, respectable and have sense of responsibilities (Bulus 2011). Currently, Fletcher (2014) suggested internal locus of control could make students feel more powerful, and reduced negative label to them if they have a bad experience. Students with a strong locus of control bounce back from failure by changing their behavior and their strategy. Thus, it is imperative to understand trainee teachers' locus of control because it could accounts for their personal success and failure when they enter real school environment. These attributions may also influence their future behavior in working environment. The following section highlighted social learning theory that underpinning the concept of locus control.

45.2 Literature Review

The concept of locus of control is an expectancy variable stemmed from Rotter's social learning theory. Generally, there were several social learning theories including (Bandura 1977; Mischel 1973; Rotter et al. 1972) that share the idea that learning happens in a social context and that it accounts for human behaviour. However, Rotter (1954) as cited in Miller (2005) combined behavioural and cognitive psychology concepts because he believed "reinforcements" (rewards and punishments) are the main determinates in our behaviour. Through reinforcements people begin to formulate beliefs about what causes their behaviours. These beliefs then establish what kinds of attitudes and behaviours people have. Rotter's (1954) social learning theory of personality provides a general conceptual framework for the development of the nature and outcomes of reinforcement (Rotter 1966). Rotter (1954) distinguished the differences between internal and external reinforcement. He asserts that internal reinforcement is a subject's experience or observation that a past event is somewhat valuable for him while external reinforcement is the

occurrence of an event that has some reinforcement value for the subject. In his investigation of general expectancies for reinforcement, Rotter (1966) claimed that the influence of reinforcement on prior behaviour is partly dependent on whether the person observes the reward is a result of his own behaviour or independent of it. In other words, the effect of reinforcement depends on whether people recognize a causal connection between their own behaviour and the reward. When people do not see reinforcement as being entirely contingent upon a person's behaviour, they interpret this as a result of luck, chance, and fate or under the influence of powerful others. These arguments gradually shaped the development of the locus of control construct. Rotter (1966) further asserted that people's perceptions of the causal relationship vary in degree between internal control and external control. A person with an internal control belief usually believes that life event is contingent upon his own action, while a person of external control belief feels the reward is controlled by forces outside of him. According to Pareek (1998) Internality is related to effectiveness and adjustment. Besides, internality has been reported to be more sensitive to new information, more observant and more likely to attend to cues that help resolves uncertainties and prone to intentional and incidental learning (Wolk and DuCette 1984).

Rotter (1966) developed the first instrument to measure internality and externality. However, his unitary concept of internality has been challenged. Engelbrecht (2009) reviewed in his literature concluded that Rotter's instrument was found to be multidimensionality that contain items related to control ideology, personal control, system modification and race ideology. Later Levenson (1981) proposed a new scale to measure internality and externality instead of viewing these elements along a continuum. Levenson (1981) proposed two subscales for externality; one to measure perceive influence of chance and the other to measure perceived influence of powerful others. Pareek's (1998) later modified Levenson's instrument to suit for organizational context.

45.2.1 Locus of Control and Gender

Studies on gender differences in locus of control have been wide ranging (Chubb and Fertman 1997). Several studies have established that females have more external locus of control than males do. Conversely, Serin et al. (2010) found that male students have more internal locus of control scores. Parallel, Manger and Eikeland (2000) reported that females have higher levels of internal locus of control in contrast to males. However, in a study done by Cetinkalp (2010) showed that male students have higher external locus of control. Saricam et al. (2012) found in their study that there was a significant difference between scores of internal and external locus of control of females and scores or internal and external of males. The findings indicated that the average score of external locus of control of female is lower than male and point average of internal locus of control of female is high. On the contrary, there were also studies found no significant difference between loci of

control between genders. For instance, Yasar (2006) stated that there were no difference between girls and boys in terms of locus of control.

45.2.2 Locus of Control and Academic Achievement

Previous studies showed significant relationships between locus of control and academic achievement (Baker 1998; Stubbs 2001; Umoh 1991). From these studies it was concluded that internals tend to show superior achievement in comparison to their external counterparts. According to Findley and Cooper (1983) individual with internal locus of control try harder and get better results in schools. They devote longer period of time to homework and study more for exams. On the other hand, if a student tries hard at school tasks and yet continually fails to get good grades, this will lead to an external locus of control (Benderm 1995). He further elaborates that a high external of locus of control will cause a lack of motivation and thus they may feel that there is no point in working hard because their efforts will only bring disappointment. Sherris and Kahle (1984) studied the effects of concept related to teaching and locus of control on meaningful learning. The study concluded that teaching is not influential on meaningful learning, but those students with internal locus of control are more successful than those with external locus of control. Coleman et al. (1999), on the other hand, suggest that those people with internal locus of control are related to affective devotion, while those having external locus of control to continuous devotion.

Much has been said about locus of control of prospective teachers, nevertheless, the challenges of the trainee teachers nowadays are much more intense than decades ago. Besides, in order to be highly marketable in the career domains, trainee teachers need to possess excellent academic performance as well as strong and formidable soft skills. The overriding question is, are these prospective teachers able to cope with the challenges when they enter the world of work? Studies on locus of control is related to many organizational variables, such as job satisfaction, motivation and performance (Spector 1982), however, there were not much studies found to understand locus of control among trainee teachers in local setting. This study sheds some light and provides a platform to assess the locus of control among trainee teachers of University Technology MARA.

45.3 Objectives of the Study

The objectives of the study were fourfolds, namely to determine (a) the nature of locus of control among trainee teachers of UiTM, Shah Alam (b) significant difference between locus of control and gender (c) significant difference between locus of control and program (d) the relationship between locus of control and academic achievement among trainee teachers of UiTM, Shah Alam.

45.4 Methodology

This study employed a survey method using cross sectional research design. A self report questionnaire was used to gather information related to the objectives of the study. The construct of locus of control was based on a conceptual framework of Rotter (1966) social learning theory. Locus of control inventory developed by Pareek (1998) was used in this study. The instrument consisted of 30 items which contains ten statements each for measuring internality (I), externality- others (EO) and externality –chance (EC). Internality is related to effectiveness and adjustment. Each of items were measured using 5-point scale where 5 = strongly agree to 0 = seldom or never agree. A locus of control is reflected in the way a person views how much control the individual believes that he or she has in important organizational matters, how much control the person believes is held in certain others and to what degree the individual believes events are a matter of luck. The samples were drawn from the faculty of Education final semester trainee teachers undertaking Bachelor Degree of Education from several programs namely TESL, Visual Art education, Physical education, Mathematics education and Sciences education. Based from a table mathematical formula taken from Cohen et al. (2000), a sample size of 250 was determined. However, a total 191 responded and the completed questionnaire. Hence the responses rate was 76.4 %. The majority of these trainee teachers were female (78 %) as compared to male respondents (12 %).

45.5 Findings

Objective 1: Analysis on the nature of locus of control among trainee teachers of UiTM (Table 45.1).

The mean scores are arranged in descending order and the result depict that the mean scores of all the three components range from 5.35066 to 4.4737, which indicates that the scores are between high to moderate. The result also indicates that internal mean score (mean=5.3066, SD=0.76606) is higher than external others mean score (mean=4.4990, SD=0.82225) and external chance mean score (mean=4.4737, SD=1.02978).

Objective 2: Analysis on the differences between locus of control and gender
Based on the independent *t*-test shown in Table 45.2, there was no significant differences between locus of control and gender; where $t=0.602$ ($p=0.549$). Therefore,

Table 45.1 The nature of control among trainee teachers of UiTM, Shah Alam

Nature of locus of control	Mean	Std deviation
Internal	5.3066	0.76606
External- others	4.4990	0.82225
External chance	4.4737	1.02987

Table 45.2 Independent *t*-test between locus of control and gender

	Mean	Std dev	t	df	p
Locus of control					
Male	4.820	0.742	0.602	191	0.549
Female	4.7504				

Table 45.3 ANOVA analysis on the differences between locus of control and programs

	Sum of squares	df	F	Sig value
Between groups	4.027	5	1.883	0.09
Within groups	79.546	186		

Table 45.4 Correlation coefficient between locus of control and CGPA

	Academic achievement	P value
Internal	0.138	0.05
External – others	0.058	0.42
External – chance	0.062	0.39

the result indicates that gender, i.e. whether the females or males do not show any significant effect on locus of control. This study is parallel to research done by (Yates 2009; Shivali 2012).

Objective 3: Analysis on the differences between locus of control and programs. Based on the ANOVA analysis shown in Table 45.3, there was no significant differences between locus of control and programs; where F value=1.883 (p=0.09). Therefore, the result indicates that these trainee teachers who were undertaking various programs namely TESL, Visual Art education, Physical education, Mathematics education and Sciences education did not show any significant effect on locus of control.

Objective 4: Analysis on the relationship between locus of control and academic achievement.

Table 45.4 shows the value of correlation coefficient between academic achievement and locus of control dimensions’ namely internal, external others and external chance. The results showed that there was a positive but low relationships between academic achievement and internal locus of control (r=0.138, p=0.05). However, there were no relationships between academic achievement and external others and (r=0.058, p=0.42) and external chance (r=0.062, p=0.39). This findings supported the study done by Bulus (2011).

45.6 Discussions and Conclusions

The aim of this study was to investigate the nature of locus of control among trainee teachers of UiTM. The finding revealed that the trainee teachers of UiTM exhibited more of internal locus of control as compare to external others and external chance. This study suggests that these trainee teachers believed that the outcomes of events to be internally controlled. They believed in their own persona efforts, behaviour or skills will influence and determine outcomes and they take responsibility for their actions. According Fakeye (2011), individual with a high internal locus of control have better control of their behaviour, tend to exhibit more political behaviours, and are more likely to attempt to influence other people than those with a high external locus of control. On the other hand, individual with a high external locus of control believe that powerful others, fate, or chance primarily determine events. Nevertheless, Tucker et al. (2007) asserted that individual with an external locus of control tend to be more stressed and prone to clinical depression. Furthermore, external locus of control makes people vulnerable to manipulation and open to abuse since externals would depend largely on the reinforcement by significant others for everything they do. Tucker et al. (2007) further elaborated that internals are more at peace with themselves and they take responsibility for their mistakes and successes.

The finding of this study also showed that there were no significant differences between locus of control and gender and program. This result is in line with the study done by Chubb et al. (1997). However, the result showed that there was a positive relationship between internal locus of control and academic achievement. In this sense, Bulus (2011) noted that learners with internal locus of control are more effective in acquiring and using required knowledge than externals. Grimes et al. (2004) noted that locus of control is a psychological construct that identifies an individual's beliefs about the degree of personal control that can be exercised over his or her environment. Therefore, students who see that they are able to control and manipulate things that happen in their lives are seen as having an internal locus of control. A student who blames teachers or other students for what is going wrong in their educational experience is seen as having an external locus of control and being at risk.

In sum, as Malaysia's National Mission aims to attain a developed country status by 2020, quality of education is a crucial factor in producing first class human capital. Hence, for the growth of a normal and successful personality pattern, trainee teachers should be taught to have better self concepts. They can have self confidence rather than feeling helpless and leaving everything to fate, to outside force so that they are able to take up various responsibilities in life. Hence, given this juncture, a better understanding of trainee teachers' locus of control is imperative where policy makers and educators can develop training programs to facilitate towering personality and also success for this future teacher to be at their workplace. It is recommended that further studies on internal locus of control among teachers should be delivered. Managing students in classrooms, teaching activities and administrative works contributes to significant amount of stress to teachers and trainee teachers.

In other words, mental and physical health among teachers are as important as their content knowledge. Hypothetically, a higher internal locus of control should contribute to a lower stress level and stable internal locus of control could buffer the stress level. More research on locus of control, school management and its synchronization should be conducted to lessen the gap between teaching, administrative works and mental/physical health. Hopefully, in delivering these research the amount of stress decreases over time and teachers may contribute their best in teaching and learning.

Lastly, although the results of this study extend the understanding of locus of control, it does have some limitations which warrant a review such as sample size and other variables which include motivation, attitude and purpose of lives. It is suggested for the next studies to be conducted at other universities which could be perform in-depth studies. It may be useful, to compare results and discussions of the same research but different regions, fields and demographic background.

References

- Baker, N. (1998). *Professional development: Teaching and learning*. Bradley/New York: McGraw-Hill.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs: Prentice Hall.
- Benderm, W. N. (1995). *Learning disabilities: Characteristics, identification and teaching strategies* (2nd ed.). Needham Height: Allyn and Bacon.
- Bulus, M. (2011). Goal orientations, locus of control and academic achievement in prospective teachers: An individual differences perspective. *Educational Sciences: Theory and Practice*, 11(2), 540–546.
- Cetinkalp, Z. K. (2010). The relationship between academic locus of control and achievement goals among physical education teaching program students.
- Chubb, N. H., & Fertman, C. (1997). Adolescent self-esteem and locus of control: A longitudinal study of gender and age differences. *Adolescence*, 32(125), 113.
- Chubb, N. H., Fertman, C. I., & Ross, J. L. (1997). Adolescent self-esteem and locus of control: A longitudinal study of gender and age differences. *Adolescence*, 32, 113–129.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education*. London: Routledge/Falmer.
- Coleman, D. F., Irving, G. P., & Cooper, C. L. (1999). Another look at the locus of control organizational commitment relationship: It depends on the form of commitment. *Journal of Organizational Behavior*, 20(6), 995–1001.
- Engelbrecht, C. (2009). *Determining the construct validity of Udai Pareek's Locus of control inventory*. Unpublished Master Degree in Industry Psychology, University of Pretoria
- Fakeye, D. O. (2011). Locus of control as a correlate of achievement in English as a second language in Ibadan. *The Journal of International Social Research*, 4(17), 546–552.
- Findley, M. J., & Cooper, H. M. (1983). Locus of control and academic achievement: A literature review. *Journal of Personality and Social Psychology*, 44(2), 419–427.
- Fletcher, L. (2014). *Student centered locus of control education advantages and disadvantages*. Retrieved from the internet dated 1.5. 2014. <http://everydaylife.globalpost.com/studentcentered-locus-control-education-a...>

- Ghonsooly, B., & Rezvani, Y. (2012). The effect of EFL teachers' locus of control on EFL learners' reading achievement. *Modern Language Journal of Language Teaching Methods*, 19(12), 12–20.
- Graham, B. (2006). Conditions for successful field experiences: Perceptions of cooperating teacher. *Teaching and Teacher Education*, 22(8), 1118–1129.
- Grimes, P. W., Millea, M. J., & Woodruff, T. W. (2004). Grades-who's to blame? Student evaluation of teaching and locus of control. *The Journal of Economic Education*, 35(2), 129–147.
- Korthagen, E., Loughran, J., & Russell, T. (2006). Developing fundamental principles for teacher education programs and practices. *Teaching and Teacher Education*, 22, 1020–1041.
- Levenson, H. (1981) Differentiating among internality powerful others and chance. In H. M. Lefcourt (Ed.), *Research with the locus of control construct*. New York: Academic.
- Manger, T., & Eikeland, O. (2000). On the relationship between locus of control, level of ability and gender. *Scandinavian Journal Psychology*, 41(3), 225–229.
- Miller, J. (2005). *The impact of locus of control on minority students*. Unpublished Master degree thesis. University of Wisconsin-Stout.
- Mischel, W. (1973). Toward a cognitive social learning conceptualization of personality. *Psychology Review*, 80, 252–283.
- Pareek, U. (1998). *Locus of control inventory* (The Pfeiffer Library 2nd ed., Vol. 8). San Francisco: Jossey-Bass.
- Richards, J. C. (2002). *Beyond training*. Cambridge: Cambridge University Press.
- Rotter, J. B. (1954). *Social learning and clinical psychology*. Englewood Cliffs: Prentice Hall.
- Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs*, 80(1), 1–28.
- Rotter, J., Chance, J., & Phares, J. (1972). *Applications of social learning theory of personality*. Englewood Cliffs: Prentice Hall.
- Sabar, N. (2004). From heaven to reality through crisis: Novice teachers as migrants. *Teaching and Teacher Education*, 20, 145–161.
- Saricam, H., Duran, A., & Cardak, M. (2012). The examination of pre-school teacher candidates' academic locus of control level according to gender and grade.
- Serin, N. B., Serin, O., & Sahin, F. S. (2010). Factors affecting the locus of control of the university students. *Procedia Social and Behavioral Sciences*, 2(2010), 449–45.
- Sherris, J. D., & Kahle, J. B. (1984). The effects of instructional organization and locus of control orientation on meaningful learning in high school biology students. *Journal of Research in Science Teaching*, 21(1), 83–94.
- Shivali, B. (2012). Locus of control in relation to various differential variables of B.Ed. student. *Journal of Environmental Research and Development*, 7(1), 339–342. July–September 2012 *Social Psychology*, 54.
- Spector, P. E. (1982). Behavior in organizations as a function of employee's locus of control. *Psychological Bulletin*, 21, 482–497.
- Strauser, D. R., Ketz, K., & Keim, J. (2002). The relationship between self- efficacy, locus of control and work personality. *Journal of Rehabilitation*, 68, 20–26.
- Stubbs, M. (2001). *Words and phrases: Corpus studies on lexical semantics*. Oxford: Blackwell Publishers Ltd.
- Tang, S. (2003). Challenge and support: The dynamics of student teachers' professional learning in the field experience'. *Teaching and Teacher Education*, 19, 483–498.
- Tucker, M. J., Berg, C. J., Callaghan, W. M., & Hsia, J. (2007, September). Tucker et al. respond. *American Journal of Public Health*, 97(9), 1541–1541.
- Umoh, S. J. (1991). Enhancing functional reading among the youths through newspapers and magazines: A teachers brief case technique. In *Literacy and reading in Nigeria*. Ibadan: University Press.

- Wolk, S., & DuCette, J. (1984). Intentional performances and incidental learning as a function of personality and task direction. *Journal of Personality and Psychology*, 29, 90–101.
- Yasar, V. (2006). *Comparison of locus of control levels and some personality characteristics of students in the 16–18 age group having education in different high schools*. Unpublished MA Thesis, Marmara Uni., Institute of Educ. Sci. İstanbul.
- Yates, R. (2009). *Locus of control and academic achievement: A study of gender and grade level differences among low-income African American students in a middle school*. Unpublished Doctoral Degree, University of Illinois, Springfield.

Chapter 46

Science Teachers' Continuous Professional Development: A Preliminary Finding

Mohamad Hisyam Ismail, Nabilah Abdullah, Muhamad Furkan Mat Salleh, and Mohd Shafik Yahya

Abstract Numerous studies on science teachers' professional development status reported that despite having attended the required centralized courses and in-house trainings, there are those who still struggle to plan for and implement appropriate, well-structured lessons. This study has been carried out to identify aspects relating to instructional practices that science teachers are still lacking in, to investigate the nature of training that they have attended as well as the ones they would like to go for; and to unearth issues surrounding their training for professional growth. Twenty science teachers with less than 5 years of service were involved in this study. Data were obtained through qualitative means via interviews and document analysis. The findings revealed aspects that the science teachers had trouble in are associated with instructional strategies, content knowledge, understanding of learners, assessment and creativity in class. The teachers also raised concerns about the nature of existing and future trainings for the development of effective science teachers; on which recommendations are put forward and a possible professional development framework could be expounded.

Keywords Science teacher • Teacher training • Continuous professional development

46.1 Introduction

The philosophy of teacher education in Malaysia which was formulated in 1982 determines the direction of teacher training emphasizing in the desire to educate and produce teachers who are noble and caring, knowledgeable and skilful, creative and innovative, resilient and competent, scientific in outlook, committed to upholding

M.H. Ismail (✉) • N. Abdullah • M.F.M. Salleh • M.S. Yahya
Science Education Department, Faculty of Education, Universiti Teknologi MARA,
Section 17 Campus, 40200 Shah Alam, Selangor, Malaysia
e-mail: hisyam_ismail@salam.uitm.edu.my

the aspirations of the nation, proud of their heritage and dedicated to the development of the individual and preservation of a united, progressive, and disciplined society (Hazri et al. 2011). The Ministry of Education has also accentuated that one of its policies is to heighten the teaching profession by elevating the quality in teaching, promoting the profession as a career choice, with an uplift in teacher welfare (MOE 2013).

With the aspirations of shifting gears towards knowledge-based economy (K-economy) and sustainable development, Malaysia needs to invest in the development of human capital. Essentially, teachers may play their roles effectively as part in developing human capital for the nation through teaching and learning. For positive results, teachers must be provided with quality training programs that allow for continuous professional development (CPD) to prepare them for critical tasks. Concurrently, teachers must be given the opportunities to attend courses, seminars, and colloquiums to gradually develop their knowledge and skills. Such provisions may help improve the teachers' ability as instructors, improve their skills in classroom management and school or community events. Nevertheless, teachers also need to re-visit their personal educational philosophy; become aware of more recent learning theories, nature of student assessment with educational policies, and enhance various personal skills relating to technology use; also enhance their inter and intrapersonal communication.

As the core business of teachers is teaching, they are expected to possess high intellectual in content, pedagogical and communication abilities to provide quality learning environment via students' engagement and self regulation in learning. Nonetheless, such expectation can lead to stress, especially for beginning teachers who may lack the experience and skills in conducting lessons (Kyriacou and Stephen 1999). To improve the quality of their teaching teachers would attend various CPD programs carried out either either within or outside the school. In the effort of emphasizing the importance of attending trainings for enrichment and teacher professionalism, a certain number of training hours have been included as part of evaluation criteria for teachers' annual appraisal. Despite the availability of trainings there are teachers who are still not ready to deal with classroom challenges. A review of past studies on pedagogical issues and training of teachers suggests that educators across the profession are recognizing the importance of enhancing training and its practical elements (Clift and Brady 2005). Irrespective of the kinds of trainings that teachers had, Oh et al. (2005) believed that trainings should result in higher confidence for teachers to improve lessons, set alight teachers' satisfaction in their teaching career, and improve teachers' efficacy.

With emphasis in training, this study aims to unravel science teachers' continuous professionalism development in schools based on aspects relating to instructional practices, nature of internal and external trainings being conducted, and issues on training for professional growth as science teachers.

Specifically, this study is conducted to fulfil the following objectives:

- (i) to identify aspects relating to instructional practices that science teachers are still lacking;

- (ii) to investigate the nature of training that they have attended as well as the ones they would like to go for,
- (iii) to disclose issues surrounding their trainings for professional growth.

Based on the objectives stated, thus this study intended to answer the following research questions;

- (i) What are the aspects relating to instructional practices that science teachers are still lacking?
- (ii) What are the nature of training that being conducted for the science teachers?
- (iii) What are the types of training that the science teachers prefer to attend?
- (iv) What are the issues on training for professional growth that the science teachers faced?

It is important for the researchers to recognize the problems, dilemmas, triumphs and opportunities weathered upon science teachers in schools so that appropriate strategies could be formulated to address and further enhance the qualities of teachers. The researchers also will examine the teacher readiness to teach science in schools and its influence based on their knowledge and experiences.

46.2 Review of Related Literature

Training on instructional practices is one of the most crucial aspects for the development of teacher professionalism in schools. It is generally believed that knowledge and skills to teach can be learned through training and practical application (Collins 1989). Teacher trainings provide the opportunities for teachers to put the theories they learnt into practice. Lock (1977) suggested that the challenges faced by teachers should be considered as they are able to provide information for the improvement of teacher professionalism while simultaneously diminishing encountered challenges. Briggs and Richardson (1992) cautioned that the various problems faced by teachers, especially on instructional practices may be signs of future conflicts. Similarly, Chan and Leung (1998) advocated that it was necessary to focus on the concerns expressed by teachers.

46.2.1 Challenges in Teaching

In a study carried out on the challenges faced by teachers and how these challenges might have affected various aspects in teacher education revealed that the gravities they experienced during instructional practices prevented the teachers from engaging positively in theory and practice (Ong et al. 2004). Although the teaching processes bridge the teachers with the experience to develop personal competence and professional identity as teachers (Dobbins 1996), the teaching experience was also

fraught with difficulties and concerns which might have influenced the development of teachers professionalism especially among novice teachers. Schön's (1983) has drawn the argument that in the teaching profession, the theoretical facets are embedded in and inseparable from practice. Using Schon's idea, the actual teaching would probably be the best form of training as highlighted in the old proverb that "experience is the best teacher".

During teaching, novice teachers experience a learning situation that are different from the way they learnt in universities. Instead of having friends as audiences during microteaching, they have to confront real students with varying personalities, habits, attitudes, abilities and styles. They will no longer be confronted with make-belief teaching and learning issues; and some of the classroom realities can actually make or break them. Hence, the novice teachers must be courageous and willing to explore and acquire new knowledge and skills related to teaching; they too must understand the psychology of learners if they are to capture and stimulate students' interest to learn. It is through the activities of integrating content knowledge, understanding about teaching and good grasp about learners that shape novice teachers into professionals who are knowledgeable with respect to the content of the subject (Shulman 1987).

However, different issues has been brought up by Aldrich (1990) and Pushkin (2001) who claimed that novice teachers generally do not know how to teach (Siti Zohara Yassin 2005). The claim was supported by Darling-Hammond (2006) who agreed that novice teachers are still fresh and are being influenced by their school and college experiences. In terms of their ability to teach, many scholars found that the newbies do not have content-knowledge and they did not know the appropriate teaching method for their students (Darling- Hammond 2006). Being inexperienced, these teachers were also found to have adjustment issues in schools.

Another aspect that the novice teachers have to deal with is their self-awareness, namely the formation of a new social identity or a "new persona as teachers" (Polio and Wilson-Duffy 1998). Ishihara (2005) highlighted that while teaching in the classroom, there are many other concerns that has been raised on novice teachers, such as language proficiency and self-esteem as well as cultural knowledge of the content matter (Polio and Wilson-Duffy 1998). Hanipah (2004) finds that teachers seldom question their assumptions and the beliefs they developed in teaching. Ong et al.'s (2004) study however, discovered many positive aspects of teaching practice. It also highlighted – too a very disturbing trend – that almost 55 % of the novice teachers discovered their teaching practice failed to provide opportunities for them to engage in theory and practice due to overwhelming realities of actual classrooms. Ong et al. (2004) also identified some challenges that burdened the novice teachers – environment, workload, pedagogical knowledge and content knowledge – but never probes into the strategies adopted by the teachers to overcome those challenges, implying perhaps the teachers were never given the chance to reflect upon the strategies that they drew upon to confront those challenges.

When dealing with science subjects, it is known that subjects like Physics, Chemistry, Biology or even general Sciences are among difficult subjects to be taught and learned. This in turn creates a huge challenge for science teachers.

Hence, the use of appropriate teaching approach during science lesson is crucial. To have well-structured lessons for quality teaching in classrooms and to keep up with current educational demands, continuous training on instructional practice must be adequately provided. Melor et al. (2010) stated that among the main challenges faced by novice science teachers include addressing cultural differences, relating science theory to its applications, selecting appropriate teaching methodology or strategy to teach a specific science topic, and classroom management. Additionally, some novice science teachers might encounter challenges in dealing with the needs of unmotivated learners and learners with different levels of achievement (Kyriacou and Stephens 1999; Swennen et al. 2004; Mehmet 2008).

46.2.2 Readiness to Teach

“Practice makes perfect” is a quotation that can be used to stress on the importance of preparation towards perfection in teaching. Perfect teaching can lead teachers to become very effective in their teaching. Shulman (1987) suggests that certain knowledge is necessary for the teachers to become an effective teacher. Besides content knowledge, teachers are also required to have not only pedagogical knowledge, but also pedagogical content knowledge. To become effective teachers, they must be proficient in aspects which are further discussed in the next section.

46.2.2.1 General Pedagogical Knowledge and Beliefs

According to Borko and Putnam (1996), this domain includes knowledge and beliefs about classroom management, instructional strategies and learners that transcend particular subject matter domains. Knowledge of classroom management has been described as an important element in this domain. For example, teachers should possess knowledge on how to keep a number of pupils working together and oriented toward classroom tasks. A conception of classroom management that is in line with a cognitive psychology offered by Doyle (1986) suggests that the major tasks of classroom teaching are promoting order and learning.

The task of promoting order is mainly for the purpose of establishing and maintaining an environment that promote learning. Thus, Borko and Putnam (1996) stressed that to accomplish a given task, teachers must have strategies for establishing rules and procedures, organizing groups, monitoring and pacing classroom events, and reacting to misbehaviour. Apart from knowledge of classroom management, Borko and Putnam (1996) also explained that teachers need knowledge of how to structure classroom activities, as well as repertoires of strategies and routines for interacting with pupils, for ensuring pupils' participation and engagement, and for keeping lessons running smoothly. Besides that, Kennedy (1990) mentioned that teachers who are fluent in a subject are distinguished from others in at least three respects: they know a great deal of specific content, that is facts and ideas; they

have formed a variety of complete relationships among pieces of content; and they understand how to approach new problems or dilemmas and how to produce new ideas within the subject. On that note, a number of local studies reviewed found that novice science teachers in Malaysia are generally deficient in pedagogical knowledge and the skills in preparing effective lessons (Nabilah and Nurshamsida 2011).

46.2.2.2 Subject Matter Knowledge and Beliefs

In addition to general pedagogical knowledge and beliefs, effective teaching for understanding also requires flexible, thoughtful, conceptual understanding of subject matter (Borko and Putnam 1996). Because subject matter knowledge means different things to different people, it is important to determine exactly what is meant by subject knowledge (Turner-Bisset 2001). Borko and Putnam (1996) also noted that several important distinctions within knowledge of subject matter have been made by researchers studying teachers' knowledge and learning. Shulman (1986) outlined the original division of content knowledge into three categories: subject matter, content knowledge (the knowledge of a subject), pedagogical content knowledge (teaching knowledge of subject matter), and curricular knowledge.

46.2.2.3 Pedagogical Content Knowledge (PCK)

Pedagogical content knowledge (PCK) constructs have served as an important catalyst for considering the ways in which teachers need to think about the subjects they teach (Borko and Putnam 1996). Shulman (1986, 1987) conceptualized pedagogical content knowledge as a combination of subject matter knowledge and general pedagogical knowledge. He emphasized that pedagogical content knowledge goes beyond knowledge of subject matter in the dimension of subject matter knowledge for teaching. Shulman (1986) explained that pedagogical content knowledge includes;

“The most useful forms of representation, the most powerful analogies, illustrations, examples, explanations, and demonstrations – in a word, the ways of representing and formulating the subject to make it comprehensible to others... It also includes an understanding of what makes the learning of a specific topic easy or difficult: the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning of those most frequently taught topics and lessons.” (p.9)

Shulman (1987) further explained that pedagogical content knowledge identifies the distinctive bodies of knowledge for teaching. For Shulman, teaching must begin with a teacher's understanding of what is to be learned and how it is to be taught. He goes on to explain that teachers must have an understanding of how particular topics, problems, or issues need to be organised, represented, and adapted to different interests and abilities of learners. Meanwhile, Carter (1990) used the term pedagogical content knowledge to mean what teachers know about their subject matter

and how they translate that knowledge into classroom curricular events. This explanation shows that pedagogical content knowledge represents a class of knowledge that is central to teachers' work, that differentiates expert teachers in a subject area from other subject area experts (Cochran et al. 1993; Marks 1990), and seemingly important for teaching (Rovegno 1992).

In their extensive review on teachers' knowledge and beliefs, Borko and Putnam (1996) organized pedagogical content knowledge into four categories which are: overarching conception of teaching a subject, instructional strategies and representations; students' understanding; thinking and learning in a subject; and, curriculum and curricular materials. Borko and Putnam argued that teachers' overarching conceptions of teaching a subject can limit their efforts to learn to teach in new ways and can be resistant to change. They also claimed that teachers have limited knowledge of subject specific instructional strategies and representations, and of the understanding and thinking of their students about particular subject matter content. In similar vein, Bullough (1992), Rovegno (1992), Borko et al. (1988), and Veal (2004) found that novice teachers have a relative lack of pedagogical content knowledge. Because novice teachers have limited notion of how children learn specific content, of what children find difficult or exciting, and of common misconceptions children hold, they encounter difficulties in representing content appropriately for helping pupils learn (Rovegno 1992). These findings suggest that teachers, particularly beginners, need assistance in developing PCK because limited PCK does affect lesson planning and teaching.

46.2.2.4 The Nature of Pedagogical Content Knowledge

In addition to teachers' subject matter (content) knowledge and their general knowledge of instructional methods (pedagogical knowledge), pedagogical content knowledge was originally suggested as a third major component of teaching expertise by Shulman (1986, 1987), and his colleagues and students (e.g. Carlsen 1987; Grossman et al. 1989; Gudmundsdottir 1987a, b; Mark 1990). Ashton (1990) described pedagogical content knowledge as a type of knowledge that is unique to teachers, and is based on the manner in which teachers relate their pedagogical knowledge (what they know about teaching) to their subject matter knowledge (what they know about what they teach). It is the integration or the synthesis of teachers' pedagogical knowledge and their subject matter knowledge that comprises pedagogical content knowledge. According to Shulman (1986) pedagogical content knowledge:

"... embodies the aspects of content most germane to its teachability. Within the category of pedagogical content knowledge I include, for the most regularly taught topics in one's subject area, the most useful forms of representation of those ideas, the most powerful analogies, illustrations, examples, explanations, and demonstrations – in a word, the ways of representing and formulating the subject that make it comprehensible to others . . . [It] also includes an understanding of what makes the learning of specific concepts easy or difficult: the conceptions and preconceptions that students of different ages and backgrounds bring with them to the learning." (p. 9)

Hauslein et al. (1992) compared the organization of subject matter knowledge between groups of experienced science teachers, experienced research scientists, novice science teachers, subject area science majors, and preservice science teachers. They found both science majors and preservice teachers demonstrated similar, loosely organized subject matter knowledge; and that the subject matter knowledge of the novice, experienced teachers and the research scientists were much deeper and more complex. However, compared to the researchers (who showed a flexible subject matter structure), the teachers showed a more fixed structure, hypothesized to result from curriculum constraints. Cochran et al. (1993) revised Shulman's original model to be more consistent with the constructivist perspective on teaching and learning. They described a model of pedagogical content knowledge that results from an integration of four major components, two of which are subject matter knowledge and pedagogical knowledge. The other two other components of teacher knowledge also differentiate teachers from subject matter experts.

46.3 Methodology

This study employed a qualitative approach whereby data were gathered mainly through interviews and supported by document analysis. A qualitative research is deemed appropriate as the researchers need to acquire rich data and information to answer the outlined objectives. A set of guidelines on what to ask the respondents was prepared prior to the interviews. The study used a purposive sampling. The target population was novice science teachers in a secondary school who has served less than 5 years around the state of Selangor. Twenty science teachers agreed to participate. All interviews were tape recorded and transcribed for analysis according to specific themes that correspond to the objectives of the study.

46.4 Findings

The discussion on findings focuses on the following; (a) aspects relating to instructional practices that the novice science teachers lack; (b) the nature of existing continuous professional development programs they attended and (c) the science teachers' view of future training for continuous professional development.

With regards to instructional practices, it was found that the research participants have problems choosing appropriate teaching strategies to teach certain science topics. Lack of experience appears to be one of the main reasons cited. Although the novice teachers are familiar with various teaching approaches, strategies and techniques, they are clearly grappling, exploring and learning which methods would work best during the teaching and learning process, as indicated in the following excerpts:

"... I'm afraid that the methodology chosen is not really suitable to implement with those students... time constraint if used other method during teaching and learning process."
Teacher 11

"I try to use different style of teaching technique, but sometimes it's hard to find the suitable teaching styles to the students..." Teacher 15

While some teachers are unsure of which teaching method to use, there are those with inferior content knowledge. This situation poses great challenges as indicated by the three teachers below:

"...my major is chemistry but I'm not master enough chemistry concept. Sometimes, I cannot explain it well to students. I also teach general science, since the topic for science subject mostly from biology subject, therefore I had problem to master the topics first before teaching students..." Teacher 5

"... my major is biology but I have difficulty in delivering the biology lesson in the simplest way. ...some how I feel my knowledge is limited which I need to study and do extra reading to make sure I really understand the topic that I'm going to teach..." Teacher 8

"... I think I need to improve my content. Sometimes, I lost while teaching and cannot elaborate more on a certain concept..." Teacher 1

Specifically, the novice teachers will be challenged when teaching high achieving students who tend to be knowledgeable or those who have learnt the subject prior to the classroom session. Teachers with inferior content knowledge often find it difficult to respond to students' questions, to elaborate and explain concepts, and to give good examples. Also, they may neither know how to gauge students' understanding nor develop good test items to assess students' learning. Sub-standard content knowledge are also common among non-option teachers having to teach general science subject matter.

With respect to classroom management, the research participants had problems understanding learners, managing misbehaviours and dealing with their attitude. In Malaysian classrooms, the average number of students is 30 to 40 per classroom. For the novice teacher, handling one problematic student may be difficult enough; bigger class size poses greater challenges hence problems. Below are some of the novice teachers' views relating to classroom management:

"...understanding students is important in order to make sure the teaching and learning process were goes smoothly and effectively. ...sometimes I also unable to control the class, especially during lab session..." Teacher 1

"...in the last class, sometimes I feel difficult to control the classroom..." Teacher 3

"... ask students to form group is really difficult, they tends to form groups with their friends. ...if I being stricto them, they will be rebellious, refuse to learn and I can feel negative aura from the students..." Teacher 18

Interview data also reveals that the novice teachers are neither well versed with assessment of, nor for students' learning. Knowledge on assessment is important because most often, assessment drives teaching. Among more senior teachers, the way teaching is carried out is very much dependent on how their students will be assessed. The research participants admitted to having used tests constructed by senior teachers instead of developing their own.

"Mostly is used my senior colleagues assessment to give to my students... not creative enough to plan a variety teaching methods and assessment..." Teacher 7

"I follow the way of experience teacher in my school teach in the class, and I also used most of the assessment from her..." Teacher 17

The above responses also suggest other possible traits of the novice teachers. Not putting effort to create own assessment may be the result of being lazy, lack of creativity or neither having enough time nor the drive to explore and plan for better teaching and assessment of students as implied in the excerpts below:

“...I think I've been using the same pedagogy and teaching methods. I've forgotten all the methods that I've learned. Maybe I'm not creative enough...” Teacher 20

“...hard to attract students to be able active in learning and focus in class during my explanation” Teacher 1

“... sometimes, I have problem to motivate my students...” Teacher 4

All teachers – novice teachers included – are required to attend Continuous Professional Development (CPD) programs. The main goal of CPD practices is to enhance teacher quality, to promote teacher professionalism (Greene et al. 2012; Lilia Halim and Subahan 2002) and to improve on the implementation of school curriculum. However, to answer the second research objective, data revealed that existing CPD practices failed to meet the professional development needs and training expectations of the novice science teachers. To begin with, most of the participants are in unison that their CPD courses were held at venues that are not conducive.

“...The program has involved teachers in all Malaysia, so, the venue being choose not suitable because not big enough. This makes the place is crowded and then, the concept of the program is talk, therefore I cannot focus and hear well because the crowded audience...” Teacher 2

“Before this I went to CPD courses in hotel, it's really comfortable to learn. Last year, I went to program in IPG hall, its really uncomfortable because crowded, due to the number of teachers attend increases and the place do not facilitate well...” Teacher 20

“...time constraint and venue affect my learning process in CPD courses.” Teacher 18

The boring manner in which training was conducted – partly contributed by unsuitable venues – also leads to dissatisfaction among the teachers, resulting in their lack of focus and unwillingness to listen.

“...The talk concept of the program, cannot focus because one way learning process, this due to a long time to listen to the talk...” Teacher 6

“To me also the program should be varied rather than talk only, for example the course can teach, teacher how to conduct the experiment in class and all the participant should do the experiment by themselves.” Teacher 18

A number of research participants also lamented the ineffectiveness of the cascade training model used by the Ministry of Education to enhance skills and knowledge among teachers:

“...most of the CPD program I had is only at school, which is in-house training. Which all the instructors are experienced teachers at my school who went to the centralized CPD programs and later share their knowledge” Teacher 7

“...I do not go a lot of CPD courses, because mostly all the expert teacher will go to CPD courses. I just had in-house sharing with them,... for one hour per session...” Teacher 9

Finally, most of the novice teachers also highlighted that core courses on improving teaching and learning are often sidelined to give room for introduction and

familiarization to new government policies; hence, they do not quite benefit from efforts to help improve the quality of teachers and teaching.

"...Most of CPD programmes just to give guideline about the new curriculum be implemented ... like the SBA, I-THINK and KBAT. But mostly... attended by expert teacher..."
Teacher 14

"Most of the CPD course that I attend is good and helpful in certain aspect only, especially for implementing new systems like SBA and Frog VLE, but for teaching and learning process in the class still lack." Teacher 15

Having specialized programs and courses that will help novice science teachers to improve on their generic pedagogical knowledge and skills; knowledge and skills in Science subjects; planning, managing and delivering science instruction; and diagnosing and evaluating students are partly what all science teachers must learn and acquire to be effective (Kamisah Osman et al. 2006). The following quotations extracted from the interview transcripts highlighted the novice teachers' needs and concerns about present and future CPD courses.

"...I think the courses should be a two way communication ...focus on the subject s/he teaches...to avoid overcrowding and to allow for more discussion...courses also need to be hands-on [for teachers to] directly implement the skills..." Teacher 8

"Before this I attend the short course on the state level for my subject, this short course is attended by all the teachers in this subject and we share and discuss about the best technique and method to teach the subject. All the experienced teacher also shares about technique for making paper. But the program was now being stopped because do not have funding..." Teacher 3

"...Instructor [of] the CPD courses... sometimes I feel [is of] the same level with me... also lack of experience but try to teach in class..." Teacher 13

In short, most of the novice teacher in this study coveted for CPD courses that address their weaknesses; hands-on and practical; that would benefit many while develop their professionalism. The novice teachers also point up that novice teachers should also be given equal opportunity to attend CPD courses which would address not only their weaknesses but also improve their practical skills, and uplift their professionalism. These teachers also emphasized that instructors of CPD courses should be those who have established credibility to conduct such courses.

46.5 Conclusion

From the study, teachers with less than 5 years experience need to improve their instructional practices to attain quality teaching that will result in enhanced students' learning. Improvement via attending CPD programs will also prevent them from being professionally stagnant at the same level over an extended period. Instructional-related aspects identified as requiring immediate attention and enhancement include (i) instructional strategies; (ii) poor content knowledge; (iii) understanding learners; (iv) assessment matters; and (v) being creative in class. Efforts to provide sound CPD programs nevertheless should be better than the ones currently offered or practiced; taking into account the actual needs of the novice

science teachers. Reconditioning of identified areas may improve CPD courses to be more structured and engaging. Other considerations in the implementation of CPD courses should include provisions of appropriate venue, appropriate duration, number of participants; scope of the course; credible instructors, and delivery mode. If Malaysia education is serious about improving teacher quality and the teaching quality in schools, it is only right that the suggestions put forward herein be given serious considerations.

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References

- Aldrich, R. (1990). The evolution of teacher education: Policies and progress. In N. J. Graves (Ed.), *Initial teacher education*. London: Kogan Page Ltd.
- Ashton, P. T. (Ed.). (1990). Theme: Pedagogical content knowledge [Special issue]. *Journal of Teacher Education* 41(3).
- Borko, H., & Putnam, R. T. (1996). Learning to teach. In D. C. Berliner & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 673–708). New York: MacMillan.
- Borko, H., Livingston, C., McCaleb, J., & Mauro, L. (1988). Student teachers' planning and post-lesson reflections: Patterns and implications for teacher preparation. In J. Calderhead (Ed.), *Teachers' professional learning* (pp. 65–83). Great Britain: The Falmer Press.
- Briggs, L. D., & Richardson, W. D. (1992). Causes and sources of student concerns for student teaching problems. *College Student Journal*, 26, 268–272.
- Bullough, R. V. (1992). Beginning teacher curriculum decision making, personal teaching metaphors, and teacher education. *Teaching and Teacher Education*, 8(3), 239–252.
- Carlsen, W. S. (1987). Why do you ask? The effects of science teacher subject-matter knowledge on teacher questioning and classroom discourse. *Paper presented at the annual meeting of the American Educational Research Association*, Washington, DC.
- Carter, K. (1990). Teachers' knowledge and learning to teach. In W. R. Houston, M. Haberman, & J. Sikula (Eds.), *Handbook of research on teacher education* (pp. 291–310). New York: Macmillan Publishing Company.
- Chan, K. W., & Leung, M. T. (1998). *Hong Kong preservice teachers' focus of concerns and confidence to teach – a perspective of teacher development*. Retrieved from AARE the Association for Active Educational Researcher, website: <http://www.aare.edu.au/98pap/cha9836.htm>.
- Clift, R., & Brady, P. (2005). Research on methods, courses, and field experiences. In M. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education* (pp. 309–424). Mahwah: American Educational Research Association and Lawrence Erlbaum.
- Cochran, F. K., DeRuiter, J. A., & King, R. A. (1993). Pedagogical content knowing: An integrative model for teacher preparation. *Journal of Teacher Education*, 44, 261–272.
- Collins, A. (1989). In Guile, D., & Young, M. (1998), Apprenticeship as a conceptual basis for a social theory of learning, *Journal of Vocational Education and Training* 50(2) 173–92.
- Darling-Hammond, L. (2006). *Powerful teacher education*. San Francisco: Jossey-Bass.
- Dobbins, R. (1996). Student teacher self-esteem in the practicum. *Australian Journal of Teacher Education*, 21(2), 16–28.
- Doyle, W. (1986). Content representations in teachers' definitions of academic work. *Journal of Curriculum Studies*, 18, 365–379. lii.

- Greene, B. A., Lubin, I. A., Slater, J. L., & Walden, S. E. (2012). Mapping changes in science Teachers' content knowledge: Content maps and authentic professional development. *Journal Science Education Technology*, 22, 287–299.
- Grossman, P. L., Wilson, S. M., & Shulman, L. S. (1989). Teachers of substance: Subject matter knowledge for teaching. In M. C. Reynolds (Ed.), *Knowledge base for the beginning teacher* (pp. 23–36). New York: Pergamon.
- Gudmundsdottir, S. (1987a). Learning to teach social studies: Case studies of Chris and Cathy. Paper presented at the annual meeting of the American Educational Research Association, Washington, DC. (ERIC Document Reproduction Service NO. ED 290 700).
- Gudmundsdottir, S. (1987b). Pedagogical content knowledge: Teachers' ways of knowing. Paper presented at the annual meeting of the American Educational Research Association. Washington, D.C. (ERIC Document Reproduction Service NO. ED 290 701).
- Halim, L., & Meerah, S. M. (2002). Science trainee teachers' pedagogical content knowledge and its influence on physics teaching. *Research in Science & Technological Education*, 20, 215–225.
- Hanipah, H. (2004). *Learning to be reflective: From theory to practices Malaysia experiences*. Tanjong Malim: Universiti Pendidikan Sultan Idris Press.
- Hauslein, P. L., Good, R. G., & Cummins, C. L. (1992). Biology content cognitive structure: From science student to science teacher. *Journal of Research in Science Teaching*, 29, 939–964.
- Hazri, J., Nordin, A. R., Reena, R., & Abdul Rashid, M. (2011). *Teacher professional development in Malaysia: Issues and challenges*
- Ishihara, N. (2005). *Intercultural challenges and cultural scaffolding: The experience of a nonnative english-speaking student teacher in a practicum in second language teaching*.
- Kamisah Osman, Halim, L., & Meerah, S. M. (2006). What Malaysian science teachers need to improve their science? *Eurasia Journal of Mathematics, Science and Technology Education*, 9–16.
- Kennedy, M. M. (1990). Trends and issues in: Teachers' subject matter knowledge. 75
- Kyriacou, C., & Stephen, P. (1999). Student teachers' concerns during teaching practice. *Evaluation and Research in Education*, 13(1), 18–31.
- Lock, C. R. (1977). Problems of secondary school student teachers. *The Teacher Educators*, 13(1), 30–40.
- Mark, R. (1990). Pedagogical content knowledge: From a mathematical case to a modified conception. *Journal of Teacher Education*, 41(3), 3–11.
- Mehmet, C. (2008). Pre-service Efl teachers' reported concerns and stress for practicum in Turkey. *Education and Science*, 33(150), 97–109.
- Melior Md. Yunus et al. (2010). Understanding TESL pre-service teachers' teaching experiences and challenges via post-practicum reflection forms. *Procedia Social and Behavioural Sciences*, 9, 722–728.
- MOE. (2013). *Preliminary report Malaysia education blueprint 2013–2015*. (2012). Retrieved from <http://www.moe.gov.my/userfiles/file/PPP/Preliminary-Blueprint-Eng.pdf>
- Nabilah Abdullah & Nurshamsida Md Shamsuddin. (2011). Cabaran Dalam Pengajaran dan pembelajaran Sains di sekolah Menengah Harian di Malaysia. *Jurnal Penyelidikan Pendidikan*, 12, 87–101. Kementerian Pelajaran Malaysia (ISSN 1511–6530)
- Oh, D., Ankers, A., Llamas, J., & Tomyoy, C. (2005). Impact of pre-service student teaching experience on urban school teachers. *Journal of Instructional Psychology*, 32(1), 82–98.
- Ong, S. K., Ros Amisha, S., Azlian, A. A., Sharnti, K., & Ho, L. C. (2004). *Trainee teachers' perceptions of the school practicum*. *Proceedings of the National Seminar on English Language Teaching 2004* (pp. 84–89). Bangi: Faculty of Education, UKM.
- Pushkin, D. (2001). *Teacher training: A reference handbook*. Santa Barbara: ABCCLIO.
- Polio, C., & Wilson-Duffy, C. (1998). Teaching ESL in an unfamiliar context: International students in a North American MA TESOL practicum. *TESOL Journal*, 7(4), 24–29.
- Rovegno, I. C. (1992). Learning to teach in a field-based methods course: The development of pedagogical content knowledge. *Teaching and Teacher Education*, 8(1), 69–82.

- Schön, D. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4–14.
- Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57, 1–22.
- Siti Zohara Yassin. (2005). *Proses Sosialisasi Organisasi Guru Sandaran Terlatih (GST) dalam Melaksanakan Pengajaran dan Pembelajaran Di Sekolah Menengah*.
- Swennen, A., Jörg, T., & Korthagen, F. (2004). Studying student teachers' concerns, combining image-based and more traditional research techniques. *European Journal of Teacher Education*, 27(3), 265–283.
- Turner-Bisset, R. (2001). *Expert teaching: Knowledge and pedagogy to lead the profession*. London: David Fulton.
- Veal, W. R. (2004). Beliefs and knowledge in chemistry teacher development. *International Journal of Science Education*, 26(3), 329–351.

Chapter 47

Peer Evaluation System in Team Work Skills Assessment

Nur'Ain Ismail, Asniza Hamimi Abdul Tharim, Thuraiya Mohd, Nor A'aini Othman, Nur Hasni Nasrudin, Noraidawati Jaffar, Mohammad Nasharudine Shuib, Mohd Khairi Kurdi, and Ismail Yusof

Abstract The higher learning institutions in Malaysia are changing rapidly as most of the institutions take account of a number of major external factors such as soft skills. One of the essential soft skills among undergraduates that need to be assessed is teamwork. In the learning process, team work is often a crucial part where students learn to work together using their individual skills despite any personal conflict. This team work can be evaluated through the peer evaluation assessment method. Currently, this peer evaluation had been done by using the manual form that needed to be filled by students in relation to the performance of their group members. The manual peer evaluation method does not reflect the true performance of their peers because when the forms are submitted to the lecturer, everyone can see the marks given by the others. Due to this, the students will tend to give a biased assessment on the performance of their peers because they do not want to hurt the feelings of others by giving a low assessment score. Thus, the main objective of this paper is to discuss the development of an online self-assessment system or otherwise known as the e-PRS. The objective of e-PRS is to provide a non-bias platform for students to evaluate their group members on a fair basis and to ease the process of grading by lecturers. The e-PRS is the acronym for 'Elektronik', 'Penilaian', 'Rakan', 'Sebaya' which is an online evaluation system to assess soft skills. Therefore this online evaluation system has the potential to be widely used by all higher learning institutions in Malaysia. It is hoped that the development of e-PRS

N. Ismail (✉) • A.H. Abdul Tharim • N. Jaffar • M.N. Shuib • M.K. Kurdi • I. Yusof
Faculty of Architecture Planning and Surveying, Universiti Teknologi MARA (Perak),
Seri Iskandar, 32610 Perak, Malaysia
e-mail: nurai948@perak.uitm.edu.my

T. Mohd • N.A. Othman
Academic Affairs Division, Universiti Teknologi MARA (Perak),
Seri Iskandar, 32610 Perak, Malaysia

N.H. Nasrudin
Faculty of Computer Science and Mathematics, Universiti Teknologi MARA (Perak),
Seri Iskandar, 32610 Perak, Malaysia

as an online peer evaluation assessment can enable students to honestly evaluate their peers under complete anonymity because it is an online-based assessment system whereby only the lecturers will see the marks given by the students on the performance of their peers and will contribute to a sustainable learning environment due to its paperless nature.

Keywords Peer evaluation system • Soft skill • Team work

47.1 Introduction

Hard skills can be defined as the academic competencies, experience and expertise level of graduates. Previous study by Sulaiman et al. (2008) proved that today graduates are mostly academically outstanding in relation with the hard skills but seriously lack in terms of the soft skills. Soft skills are personal attributes that will enhance an individual's self-esteem and future career prospects which are interpersonal and can be broadly applicable in various situation and environment. Muir (2004) in his research found that soft skills are one of the essential tools that enable for the employees to contribute to their fullest potential. His findings was supported by Somerset (2001) who stressed out on the importance of soft skills in contributing to the success and great achievement of an organization. Another study by Archer and Davison in 2008 found that 'soft skills' were believed to have more weight than technical or 'hard skills' regardless the size of the company. According to Crosbie (2005), there are eight soft skills that should possess by an individual which are: teamwork, communication skills, initiative, leadership ability, people development/coaching, personal effectiveness, planning and organizing, and presentation skills. While Gupta (2009) stated that soft skills which includes certain abilities such as communication, problem-solving, self-motivation, decision-making, and time management skills should be embedded in universities academic module.

47.1.1 *Ministry of Higher Education, Malaysia*

Soft skills are identified to be the most critical skill in the current global job market especially in this fast moving era of technology. (Ministry of Education, Malaysia 2006)

The Ministry of Higher Education was established on 27 March 2004 which comprises of two departments : Higher Education Management Department (JPIPT) and the Polytechnic and Community College Management Department. The JPIPT is divided into two main sectors that are the IPTA (public universities) Management Sector and the IPTS (private universities) Management Sector. The Malaysian

Qualifications Agency (MQA) was set up on 1st November 2007 to enhance and accelerate the Malaysian academic quality in Higher Learning Institutions. This agency plays an important role in implementing the Malaysian Qualification Framework (MQF) as the main basis for Higher Learning Institution quality assurance. The MQF emphasis on the Nine (9) Learning Outcome of Malaysian Higher Learning Institutions namely the:

1. LO 1: Knowledge in Specific Area-Content
2. LO 2: Practical Skills
3. LO 3: Thinking and Scientific Skills
4. LO 4: Communication Skills
5. LO 5: Social Skills, Teamwork and Responsibilities
6. LO 6: Values, Ethics, Moral and Professionalism
7. LO 7: Information Management and Life Long Learning
8. LO 8: Management and Entrepreneurship
9. LO 9: Leadership Skills

In 2006, in order to support on the implementation of the above mentioned Learning Outcomes, the Ministry of Education (MoE) has identified seven soft skills that should be possessed by Higher Learning Institution graduates. Year 2007, Malaysian Ministry of Higher Education has developed and introduced soft skill module to the Malaysian public universities after taking in account on complaints made by industry and employer on the lack of soft skills attribution and possession by university graduates. These module was developed through compilation of 573 literature from past research study in other countries.

47.1.2 Evaluating Soft Skills: Team Work

One of the significant components in the soft skills module developed by the Ministry of Education (MoE) is the teamwork skills. Teamwork can be defined as the **process** of **working** collaboratively with a **group** of people in **order** to **achieve** a **goal**. Therefore it is often necessary for **colleagues** to **work** well together, trying their best in any circumstance. Teamwork also **means** that people will try to cooperate, **using** their individual **skills** and **providing constructive feedback**, despite any personal **conflict** between **individuals** (Business Dictionary.com). In order to evaluate these team work skills, a peer assessment often used to measure the performance each of the team members. Peer assessment can be define as the responsibility of assessing work of peers against various set of assessment criteria. It's one of a powerful tools for the students to have better understanding on assessment criteria and also transfer certain percentage of ownership of the assessment process and marks to them that subsequently will helps increasing their self-motivation and team work skills.

47.1.3 Factors Influencing Acceptance of Peer Assessment

According to William et al. (1998), there are few factors that influencing the acceptance of peer assessment as a tools in assessing marks for peers as the following:

- (i) Performance Level: Low performance people has the tendency to dislike the usage of peer assessment since the group members (high performance people) can hold them responsible for their lack of commitment.
- (ii) Self-Monitoring: An individual's ability and willingness to alter his or her behaviour accordingly (Snyder 1987). Where normally high performance people are able to display unfeigned emotions.
- (iii) Self Esteem: self-esteem moderates the relationship between performance feedback and future performance. Brockner et al. (1987) believed that low self-esteem individuals will respond poorly to negative feedback. Therefore, low self-esteem individuals should dislike peer evaluation system due to the fear of potential negative feedback.
- (iv) Individualism: Group members who are very individualistic may dislike peer appraisals since they allow other group members to determine their outcomes (ratings). Group members that are less individualistic (i.e., more collectivist) should be more supportive of peer appraisals, since the evaluation shifts the attention from an individual rather to the group as a whole.

Previous research by Kane and Lawler (1978) suggested three significant conditions that should be met in order for peer evaluation to be success which are:

- (i) Peers should be in a good and positive position to observe unique aspects of each other's behaviours;
- (ii) Peers should be capable of accurately perceiving and interpreting the salient aspects of each other's behaviours;
- (iii) There should be a perceived need to improve the effectiveness with which the characteristics of group members are assessed.

47.1.4 Online Peer Assessment System

In present condition, peer assessment had been done by using the manual form that need to be filled individually by group members in assessing the performance of their group members towards the end of the courses. This manual peer assessment often does not represent the actual performance of team members because of the tendency to give a biased assessment as the safety measure of not hurting the feelings of others when the forms were submitted by hand to the lecturer. Previous researcher report that students have more positive and unbiased attitudes toward evaluating peers' work when the peer evaluator is kept anonymous to the student being evaluated as reflected by similar findings by Cheng and Warren (1997). This statement also supported by Brindley and Scofield (1998), Falchikov (1986), and

Miller and Ng (1994) who believed that peer evaluator not wanting to make unfavourable judgments about the person she or he evaluates when the evaluator is expose when making the evaluation or peer assessment. Therefore this paper will discuss on the innovation approaches taken by Universiti Teknologi MARA (Perak) in evaluating the teamwork skills by using an online Peer Assessment Systems known as e-PRS. The system development and features which consist of the student and lecturer module of the online system that will enhance on the individualism and self-esteem aspects of evaluators as well as providing an anonymous and unbiased peer assessment environment.

47.2 Assessing Team Work Skills Using Peer Assessment Form

Team work skills are required to be measured in the courses when involving the ticking of social skills, team work and responsibilities (LO5). Therefore, the students of these courses will be evaluated based on their ability to work together with other people from various social and cultural backgrounds. Taken as an example for this research paper is course code QSD187: Construction Law, Diploma in Quantity Surveying which has to evaluate all the criteria of the teamwork skills listed in Ministry of Education Learning Outcomes such as TS1: ability to develop good relation, interaction and effective teamwork to achieve common goals; TS2: ability to understand and resume alternate roles between leader and group members; TS3: ability to identify and respect the behavior, attitude and belief of others; TS4: ability to contribute ideas in planning and coordinate group works; and TS5: ability to responsible with group decisions.

Therefore, lecturers take the approach to build up an appropriate rubric for TS1 until TS5 that enable the students to evaluate level of cooperation provided among group members in the course work as in Fig. 47.1. The rubrics were arranged in the table form known as the Peer Assessment Form and evaluation done by using likert scale of 1 until 4. The likert scale makes it possible for the students to distinguish the marks given for each of the group members as per Fig. 47.1.

However, after several semesters using the manual Peer Assessment Form as a tool to measure the team work skills, it gives extra work load to lecturers such as (i). the drifted of forms that have been filled by students; (ii). the students are not transparent where they intend to give full marks to their peer (Fig. 47.3); and (iii). the lectures have to transfer the marks from the form into the template created before compiled with other marks in course work (Fig. 47.2).

Figure 47.3 shows example of peer assessment that have been practiced throughout the semester. The samples consist of five (5) group members in a group. From five (5) peer assessment marks, Student A, B and C give full marks to Student D but it is contrary to the score assigned by Students E. This situation can create conflict between marks given by Student A, B, C with the marks given by Student E in evaluating the performance of Student D.

PEER ASSESSMENT FOR GROUPWORKS (TS 1 - TS 5) : QSD187					
REQUIRED SKILLS	Advanced 4	Competent 3	Progressing 2	Does not meet minimum expectations 1	SCORE
Ability to develop good relation, interaction and effective teamwork to achieve common goals (TS1)	Did more than others – highly productive Works extremely well with others, never argues Tries to keep people working together. Almost always focused on the task and what needs to be done. Is very self-directed.	Did their part of the work – cooperative. Works well with others, rarely argues. Does not cause problems in the group.	Could have done more of the work – has difficulty, requires structure, directions and leadership Sometimes argues. Sometimes not a good team member. Sometimes focuses on the task and what needs to be done. Must be prodded and reminded to keep on task.	Did not do any work – does not contribute, does not work well with others Usually argues with teammates. Often is not a good team member. Does not focus on the task and what needs to be done. Lets others do the work.	
Ability to understand and resume alternate roles between leader and group members (TS2)	Participated in all group meetings, assumed leadership role as necessary. Did the work that was assigned by the group.	Participated in most group meetings. Provided leadership when asked. Did most of the work assigned by the group	Participated in some group meetings. Provided some leadership. Did some of the work assigned by the group.	Participate in few or no group meetings. Provided no leadership. Did little or no work assigned by the group.	
Ability to identify and respect the behavior, attitude and belief of others (TS3)	Always respects teammates' opinion, and helps in developing ideas, and displays positive attitude.	Generally respects teammates' opinion, and helps in developing ideas, and sometimes displays positive attitude.	Rarely respects teammates' opinion, and helps in developing ideas, and rarely displays positive attitude.	Is disruptive in all ways	
Ability to contribute ideas in planning and coordinate group works (TS4)	Always willing to help and do more, routinely offered useful ideas. Always listens to, shares with, and supports the efforts of others. Provided effective feedback to other members. Relays a great deal of information—all relates to the topic. Tries to keep people working together. Almost always focused on the task and what needs to be done. Is very self-directed.	Cooperative, usually offered useful ideas. Usually listens to, shares with, and supports the efforts of others. Sometimes talks too much. Provided some effective feedback to others. Relays some basic information – most relates to the topic. Does not cause problems in the group.	Sometimes cooperative, sometimes offered useful ideas. Often listens to, shares with, and supports the efforts of others. Usually does most of the talking – listens to others. Provided little feedback to others. Relays very little information – some relates to the topic. Sometimes not a good team member. Sometimes focuses on the task and what needs to be done. Must be prodded and reminded to keep on task.	Seldom cooperative, rarely offers useful ideas. Rarely listens to, shares with, or supports the efforts of others. Is always talking and never listens to others. Provided no feedback to others. Does not relay any information to teammates. Often is not a good team member. Does not focus on the task and what needs to be done. Lets others do the work.	
Ability to be responsible with group decisions (TS5)	Work is complete, well organized, no errors and is done on time or early.	Work is generally complete, meets the requirements of the task, and is mostly done on time.	Work tends to be disorderly, incomplete, not accurate and is usually late.	Work is generally sloppy and incomplete, excessive errors and is mostly late or not at all.	
TOTAL					20

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Fig. 47.1 Shows the process of manual peer evaluation which comprises of various steps and possibilities

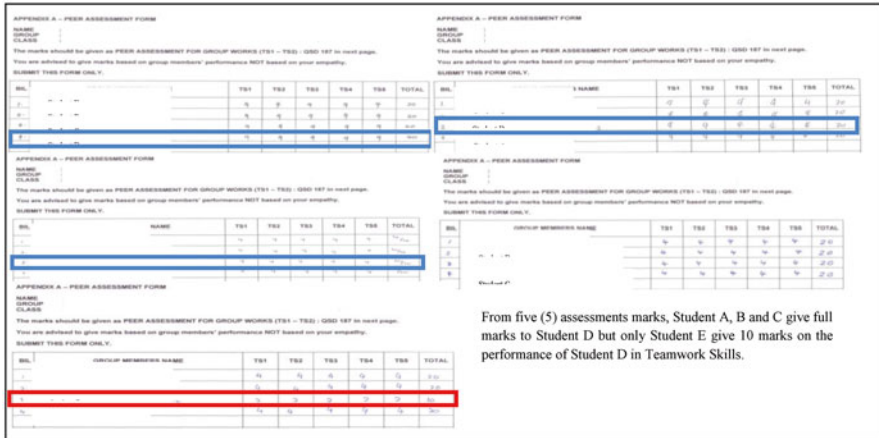


Fig. 47.3 Sample of peer assessment for one group

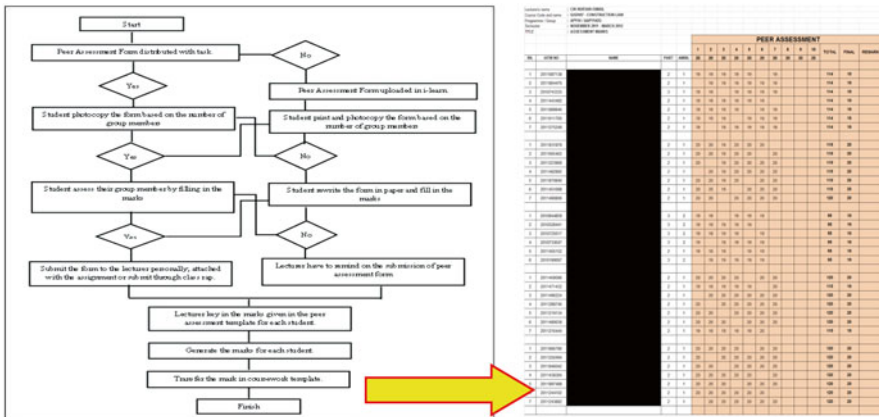


Fig. 47.2 Practice of the existing peer assessment

The manual peer assessment form does not reflect the true performance of the group members. This is due to the facts that when submitting the form to the lecturer, it is not private and confidential. Therefore, the students will tend to give a biased assessment on the performance of their group members because they do not want to hurt the feelings of others by giving a low assessment score.

47.3 Development of an Online Self-Assessment System (e-PRS: ‘Elektronik’, ‘Penilaian’, ‘Rakan’, ‘Sebaya’)

e-PRS is an innovation that has been developed to facilitate peer assessment for students or lecturers. This is because, there are some difficulties experienced by the two parties as being discussed before. The students are intend to give full marks

The image shows a web-based registration form for the 'Sistem Elektronik Penilaian Rakan Sebaya' (e-PRS). The form is titled 'REGISTRATION FORM' and contains the following fields and examples:

- STUDENT ID:** Input field with example 'EG: 2011342345'.
- I/C NO:** Input field with example 'EG: 920101102341 (Without space or '-')'.
- FULL NAME:** Input field with example 'EG: Aminah Binti Abu'.
- GROUP:** Input field with example 'EG: ACS1105A'.
- EMAIL ADDRESS:** Input field with example 'EG: nu43@gmail.com'.
- H/P NO.:** Input field with example 'EG: 0192305981 (Without space or '-')'.

At the bottom of the form is a 'REGISTER' button. The footer of the page reads '©Universiti Teknologi MARA (Perak) 2014'.

Fig. 47.4 Student registration

because they did not have the confidentiality in evaluating their group members, while the lecturers should take more time in the process of grading the team work skills for each student.

The system developed known as e-PRS which is the acronym for 'Elektronik', 'Penilaian', 'Rakan', 'Sebaya'. It is an online evaluation system to assess soft skills based on the rubric stipulated in the peer evaluation form as Fig. 47.9. The system consists of two (2) module which are student module and lecturer module.

47.3.1 Features of e-PRS ('Elektronik', 'Penilaian', 'Rakan', 'Sebaya')

47.3.1.1 Student Module

The student module consists of student registration, enroll course, enroll assignment, peer assessment and also update profile. Before using the system, the students must create an account by filling the registration form as shown in Fig. 47.4. The system allow for students to update the personal profile if there is any changes (Fig. 47.5). In order to view all assignment posted by lectures in the system, the students need to enroll the course first (Fig. 47.6). After that, the assignment topic will display for students to select and invite the group members for that particular assignment (Refer Figs. 47.7 and 47.8). The system only permitted one person to add

Sistem Elektronik Penilaian Rakan Sebaya

HOME -> Update Profile SELAMAT DATANG SIT

UPDATE PROFILE FORM

I/C NO: 931010104324

FULL NAME: SITI AMINAH BINTI MALIM
EG: Aminah Binti Abu

GROUP: ACS1105B
EG: ACS1105A

EMAIL ADDRESS: minah12@gmail.com
EG: nu43@gmail.com

H/P NO: 0192305982
EG: 0192305981 (Without space or '-')

Fig. 47.5 Update profile

COURSE ENROLMENT FORM

Faculty: Faculty Of Computer And Mathematical Sciences

Program: CS110-DIPLOMA IN COMPUTER SCIENCE

Course Name: INTERACTIVE MULTIMEDIA

LIST OF ENROLLED COURSE

No.	COURSE	Drop
1	QSD187: CONSTRUCTION LAW	<input checked="" type="checkbox"/>

Fig. 47.6 Enroll course

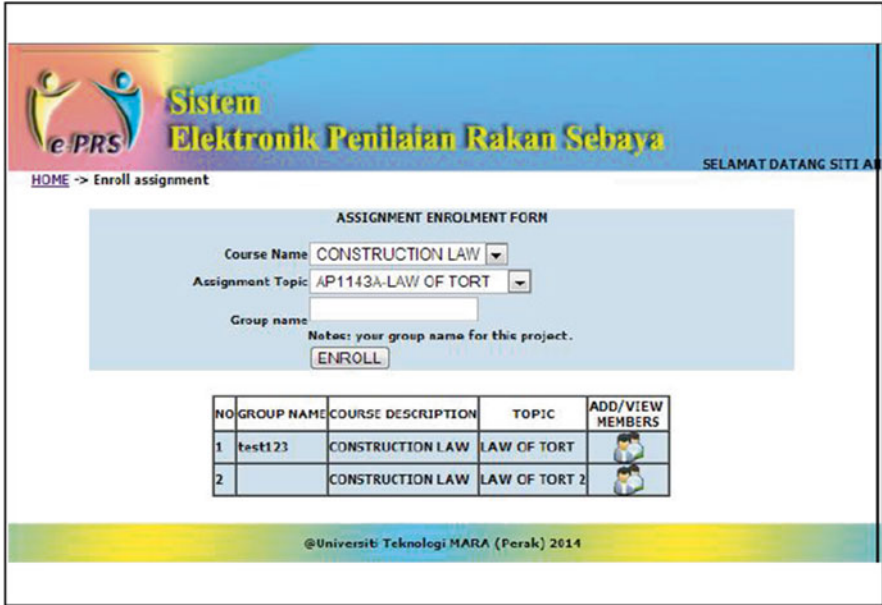


Fig. 47.7 Enroll assignment

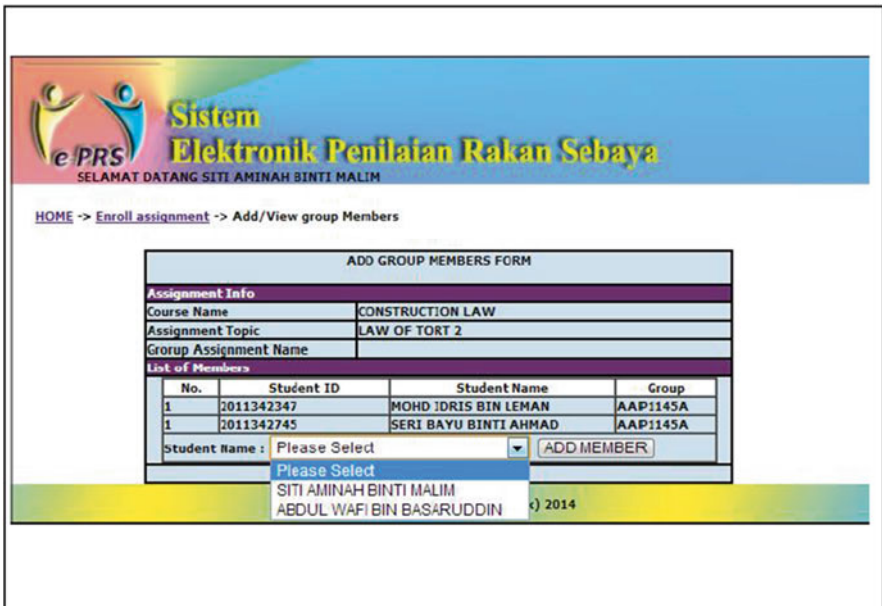


Fig. 47.8 Enroll assignment: view and add member

Sistem Elektronik Penilaian Rakan Sebaya

HOHE -> List of enrolled assignment -> Peer assessment form

PEER ASSESSMENT FOR GROUPWORKS (TS 1-TS 5)

Assignment Info

Course Name	CONSTRUCTION LAW
Assignment Topic	LAW OF TORT
Group Assignment Name	test123

The marks should be given as PEER ASSESSMENT FOR GROUP WORKS. You are advised to give marks based on group members' performance NOT based on your empathy.

NO.	GROUP MEMBERS NAME	Ability to develop good relation, promotion and effective teamwork to achieve common goals (TS1)	Ability to understand and resolve alternate roles between leader and group members (TS2)	Ability to identify and respect the behavior, attitude and belief of others (TS3)	Ability to contribute ideas in planning and coordinate group works (TS4)	Ability to be responsible with group decisions (TS 5)	TOTAL SCORE
1	ADDUL WAFI BIN BASARUDDIN	2	3	4	3	2	14
2	MOHD IDRIS BIN LENAH	2	2	3	2	2	11
3	SERI BATU BINTI AHMAD	3	3	3	3	3	15

SUBMIT ASSESSMENT

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Fig. 47.9 Peer assessment form

group members in order to proceed with the peer assessment. The students will start evaluate their group members at peer assessment form (Fig. 47.9).

The assessment based on the MoE of Learning Outcomes for teamwork skills which are TS1, TS2, TS3, TS4 and TS4. The student only choose the scale that represents the real value of teamwork skills for their group member without any undue influence from the friend. The marks given only can be seen by the lecturer so it creates more comfortable situation for the student to evaluate their group members.

47.3.1.2 Lecturer Module

The lecture module consists of manage assignment, update profile and also generate report. This system need to login by using staff identification number and also password. If there any changes in the personal information, the lecturers are allow to update the profile. The lecturers are required to manage assignment in the system for students to evaluate as shown in Fig. 47.10. All assignments that has been submitted will be display at the bottom of the form. After students evaluating their group members, the lectures can generate report to gain the peer assessment marks for individual student and their strength in the team work skills (Fig. 47.11).

The value added to this system exists in Evaluation Report which produces the scoring based on the item in team work skills (TS1 until TSS5). Here, the lecturer can

The screenshot shows the 'ADD NEW ASSIGNMENT FORM' with the following fields: FACULTY (PLEASE SELECT), PROGRAM (PLEASE SELECT), COURSE NAME (PLEASE SELECT), CLASS (with an example 'eg: CS1105A'), TOPIC, SUBMISSION DATE (format dd/mm/yyyy), PRESENTATION DATE (format dd/mm/yyyy), and MODE (INDIVIDU or GROUP). An 'ADD ASSIGNMENT' button is at the bottom.

LIST OF REGISTERED ASSIGNMENT

No.	Program/Course	CLASS/TOPIC	SUBMISSION DATE	MODE
1	AP114 QSD187	AP1143A LAW OF TORT	2014-09-18	GROUP
2	AP114 QSD187	AP1143A LAW OF TORT 2	1970-01-01	GROUP
3	CS110 CSC253	ACS1105A MULTIMEDIA IN HUMAN LIFE	2014-09-16	GROUP
4	CS110 CSC253	ACS1115A IMPACT OF MULTIMEDIA	2014-09-08	GROUP
5	CS110 CSC253	ACS1115B THE USAGE OF MULTIMEDIA ELEMENT	2014-12-10	GROUP

Navigation: [First](#) [Back](#) [Next](#) [Last](#)

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Fig. 47.10 Manage assignment

The screenshot shows the 'Generate Report' page with a 'LIST OF REGISTERED ASSIGNMENT' table. The table includes a 'VIEW REPORT' column with icons for each entry.

LIST OF REGISTERED ASSIGNMENT

No.	COURSE_CODE	TOPIC	SUBMISSION DATE	MODE	VIEW REPORT
1	QSD187	LAW OF TORT 2	1970-01-01	GROUP	
2	CSC253	IMPACT OF MULTIMEDIA	2014-09-08	GROUP	
3	CSC253	MULTIMEDIA IN HUMAN LIFE	2014-09-16	GROUP	
4	QSD187	LAW OF TORT	2014-09-18	GROUP	
5	CSC253	THE USAGE OF MULTIMEDIA ELEMENT	2014-12-10	GROUP	

Navigation: [First](#) [Back](#) [Next](#) [Last](#)

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Fig. 47.11 Generate report

see the characters of all students in the class so that improvements can be made in the next semester in terms of teaching and learning.

47.4 Impacts of an Online Self-Assessment System (e-PRS: ‘Elektronik’, ‘Penilaian’, ‘Rakan’, ‘Sebaya’)

The e-PRS is an innovation of online system which developed to overcome the problems of the accessibility to evaluate the peer assessment for students. The evaluation can be access through internet without needs to find the form from their friends. Therefore, the students have their own space evaluating their group members without having any doubt or not feeling guilty while doing the assessment. The e-PRS is a platform of non-bias peer assessment evaluation which creates more genuine assessment in the teamwork skills for further continuous improvement for the student, lecturer and also the course.

Besides that, this system will save time of students in evaluating the group members when they do not have to submit the form personally to the lecturer or hand over to the person in charge for collecting the peer assessment form. By clicking the submit button in the system, the peer assessment already sent to the lecturer’s interface. The system also saves the lecture’s time because the assessment is already generated. It saves a lot of steps in the exiting process of grading the student. The online peer assessments support the process of grading the students on teamwork skills.

The e-PRS is an online surveillance and monitoring on teamwork skills. This is because, the system kept the peer evaluation data for student from Year 1 until year 3. Therefore, the Resource Person (RP) of the course or academic advisor can monitor the performance for each student in order to meet the requirement of teamwork skills needed in the market. Besides that, the system is able to identify student’s strength in specific teamwork skills throughout the semester.

The e-PRS supports the sustainability of the environment because introducing the paperless peer assessment system. The students do not have to print or make a copy of the peer assessment form in the process of evaluating their group members. Therefore, the lecturer will not receive a bundle of peer assessment form and it will reduce the quantity of disposed paper without exercising recycling. Indirectly, the system is able to maintain the sustainability of the environment if the practice is applied continuously.

47.5 Conclusion

As conclusion, the e-PRS is an innovation from the exiting peer assessment form to overcome of the problems in the accessibility, non-transparent evaluation and the complexity of the grading process for assessing teamwork skills for each student.

The system is able to provide many advantages such as (i). easily accessible to students and lecturers; (ii). provide more comfortable space for students to exercise judgment on their group members; (iii). facilitate the process of identifying the specific teamwork skills for each student for their future improvement; and (iv). also help reduce the usage of paper.

References

- Archer, W., & Davison, J. (2008). *Graduate employability: What do employers think and want?* London: The Council for Industry and Higher Education (CIHE).
- Brindley, C., & Scofield, S. (1998). Peer assessment in undergraduate programs. *Teaching in Higher Education*, 3(1), 79–89.
- Brockner, J., Derr, W., & Laing, W. (1987). Self-esteem and reactions to negative feedback: Toward greater generalizability. *Journal of Research in Personality*, 21, 318–333.
- Cheng, W., & Warren, M. (1997). Having second thoughts: Student perceptions before and after a peer assessment exercise. *Studies in Higher Education*, 22(2), 233–239.
- Crosbie, R. (2005). Learning the soft skills of leadership. *Industrial and Commercial Training*, 37(1), 45–50.
- Falchikov, N. (1986). Product comparisons and process benefits of collaborative peer group and self-assessments. *Assessment and Evaluation in Higher Education*, 11(2), 146–166.
- Gupta, Y. (2009). Building a better business student. *BizEd*, 9(6), 62–68.
- Kane, J. S., & Lawler, E. E. (1978). Methods of peer assessment. *Psychological Bulletin*, 85, 555–586.
- Miller, L., & Ng, R. (1994). *Peer assessment of oral proficiency*. Working papers of the Department of English City Polytechnic of Hong Kong, 6:41–56.
- Ministry of Higher Education, Malaysia, 2006.
- Muir, C. (2004). Learning soft skills at work: An interview with Annalee Luhman. *Business Communication Quarterly*, 67(1), 99–107.
- Snyder, M. (1987). *Public appearances private realities: The psychology of self-monitoring*. New York: W. H. Freeman and Company.
- Somerset, F. (2001). The softer side of leadership [Electronic Version]. *CMA Management*, 75(7), 12–19.
- Sulaiman, Md., Yassin, S. M., Abu Hasan, F., Wan Mohd Amin, W. A. Z., & Amiruddin, N. A. (2008). Implementation of generic skills in the curriculum. In *Proceedings of the EDU-COM 2008 international conference* (pp. 19–21). Sustainability in Higher Education: Directions for Change, Perth Western Australia.
- William, S. L., Esther, J. L., & Gregory, H. D. (1998, Spring). Correlates of satisfaction with a peer evaluation system: Investigation of performance levels and individual differences. *Journal of Business and Psychology*, 12(13), 299–306.

Chapter 48

A Preliminary Study of a Project-Based Learning (PjBL) into the Electronic Portfolio System

Syamsul Nor Azlan Mohamad, Mohamed Amin Embi,
and Norazah Mohd Nordin

Abstract This paper presents the adoption of Project-based Learning (PjBL) into the development of e-Portfolio assessment for higher education institution. The purpose of the study was to examine the adoption of PjBL as a learning strategy into the development of e-Portfolio. Initially, this paper was conducted as a preliminary study with a total number of 30 students who undergoing Bachelor of Art and Design Education and then practicing project-based in their coursework. The pilot study was conducted and showed the reliability coefficient with Cronbach's alpha (α) is 0.9. The instrument was divided into five components which involved (1) student responsibility (2) instructor support (3) instructional methodology (4) course and instructor and (5) student interaction and collaboration, to measured the learners work preferences. The findings were reported that learners are positively accepted the learning styles as an approach in developing their metacognitive process. This project-based learning will give learner's an opportunity to face authentic and real-life situation. Therefore, project-based learning was focuses on the developmental process involving higher order thinking (HOT) to generate new ideas, solutions of problems, and self-actualization of individuals. At the end of the day, the project-based learning will not only benefit the instructor but the learners as a key referral of a competency and performance.

Keywords E-portfolio • Higher education • Higher order thinking • Learning strategy • Project-based learning

S.N.A. Mohamad (✉) • M.A. Embi • N.M. Nordin
Faculty of Education, Universiti Kebangsaan Malaysia,
43600 UKM Bangi, Selangor, Malaysia
e-mail: snazlan@siswa.ukm.edu.my

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48.1 Introduction

The adoption of a Project-based Learning (PjBL) into e-Portfolio, it seems like will be benefit the learners. It will involve the actual creation of the course content, learning materials and assessment. These learning strategies need to be aligned with a specific learning goals and able to develop higher order thinking skills among learners.

In Malaysia context, arts and design courses has been implemented projects as a routine in assessing their coursework. It's aligned with the needs of assessment provided by Malaysia Qualification Accreditation or known as MQA as a guideline in assessing students in higher education institution especially for art and design courses. So that, the portfolio become an important assessment evidences which to store, reflect and show their visual art and design projects. The e-Portfolio will acquired them to communicate with the ideas by doing collecting, displaying, articulating and evaluating the projects or tasks.

Although, e-Portfolio has been developed in many countries and fields, there is little research focused on e-Portfolio assessment such project-based, experiential education or active learning (Thomas et al. 2001; Woelfel et al. 2014; Mahmood and Hafeez 2013). Amin Embi et al. (2011) has been stated on his report only 30.9 %, which is 11–20 % of student coursework are conducted as an e-learning assessment in Malaysian HEI's. So, there is a potential and need to embrace this study due to DeFabio (1993), Jamentz (1994), and Tillema (1998) statement that the proponents of portfolio are better predictors of students' performance in 'authentic' situation and that they can also improve students' higher order thinking (HOT) skills specifically in higher education institution (Gikandi et al. 2011; Chin-Hung et al. 2013).

Considering the needs of e-Portfolio and the lack of strategy and measurement tools, PjBL has been proposed to ensure the successful of e-Portfolio to increase their engagement and intention to fulfill the task. So, the PjBL is able to offer instructor and learner's a set of strategy and measurement tools in evaluating their higher order thinking for respective courses or tasks. Despite, the potential of ICT in bringing major changes in the education system cannot be questioned. The increase in numeral, sophistication, and the role of ICTs in providing rich and effective tools to transform teaching and learning are more autonomous and entertaining.

48.2 Literature Review

PjBL projects are central, not peripheral to the curriculum (Barrows 1986; Thomas 2000). Savin-Baden (2003) defines project-based learning as being something different from problem based learning, whereas Boud (1985) claims they can be the same. However to justify based on the purpose of the study, in perspectives of

definition and conceptualization, both are the same. The difference lies in which project based learning acquires a production model while problem based learning develops an inquiry model.

The learning process in PjBL starts with the authentic (Albion 1998) problems as a context (Barrows and Tamblyn 1980). Project-based involve learners in a constructive investigation in which transferring of knowledge takes place in a real context (Brown et al. 1989; Perkins and Salomon 1989; Spiro et al. 1988). Projects are student-driven which activities is design into a different level and degrees to promote learners higher order thinking (Dunlap and Grabinger 1996).

Thomas (2000) defines PjBL is as a model that organizes learning around projects (Thomas 2000) which is presented in a student-centered environment and teacher acting as a facilitator (de Graaff and Kolmos 2002). PjBL learning environment was emphasizes on learners' application of knowledge, higher-order thinking, and self-directed learning skills (Barrows 1996; Dolmans and Schmidt 1994; Kamin et al. 2001) according to the goals and setting of learning (Nuutila et al. 2005).

The interconnection between PjBL and theoretical ideas has been proven, such as experiential learning (Kolb 1984), the reflective practitioner (Schon 1987) and constructivism and social learning (Lave 1993; Piaget 1952; Vygotsky 1979). Consequently, numerous instructional models that focus on PjBL (Ryberg et al. 2006) have agreed that the PjBL strategy is entirely in accordance with the constructivist paradigm and collaborative learning concept. As a result, there is a strong support for the notion that computer-based learning environments can be effectively used to support constructivism and transformative learning (Reushle 2005; Wilson 2004) and may offer many advantages (Reushle 2005).

In this context, the preliminary study was conducted to examine the adoption of PjBL into e-Portfolio. The constructs consists (1) student responsibility (2) instructor support (3) instructional methodology (4) course and instructor and (5) student interaction and collaboration.

48.3 Methodology

The purpose of this study is to investigate the Project-based Learning (PjBL) as a learning strategy towards the development of an e-Portfolio in selected coursework. At the pilot stage, Faculty of Education, Universiti Teknologi MARA (UiTM) has been chosen with a total number of respondents 30 students. These respondents who undergoing Bachelor of Art and Design Education, that who are practicing coursework. The questionnaire was measured learner's readiness towards the use of PjBL strategy in e-Portfolio. These items were measured on five-point Likert scale ranging from (1) *strongly disagree*, (2) *disagree*, (3) *neutral*, (4) *agree* and (5) *strongly agree*.

48.4 Data Findings and Analysis

The data findings and analysis was described as below:

48.4.1 Respondent's Profile

In this study, simple frequency and descriptive analysis was conducted on the demographic attributes. The frequencies result of the respondent's profiles. As reported, 16.7 (n=5) were male and 83.3 % (n=25) of the respondents were female. In terms of ages grouping, almost half 46.7 % average 24–25 years, 26.7 % (20–21 years), 16.7 % (22–23 years) and 10 (25 years above) (Table 48.1).

48.4.2 The Student Responsibility

Based on this construct, the learners belief that is a major responsibility for them to comply the set of skills and fulfill the task (M=4.57). The approach will encourage them to reach a variety of resources (M=4.47) and play an important role (M=4.40) by having support and assistant from peer and facilitator (M=4.40). Project involve learners to accept the challenges and specific requirement (M=4.37) pursue them to reflect and connected by using a peer or forum discussion. PjBL approach allowed learners to be evaluated (M=4.30) and transferring the knowledge to ensure the authenticity and context would benefit to them (Table 48.2).

48.4.3 Instructor Support

Based on this findings, the learners will perform if the instructor is able to encourage and guide them to express the ideas clearly (M=4.67). This phenomenon, might result the learners effort towards to explore a variety of information (M=4.53) by

Table 48.1 Frequency of demographic respondents

Demographic attributes	Frequency	% (percentage)
Gender		
Male	5	16.7
Female	25	83.3
Age		
20–21 years	8	26.7
22–23 years	5	16.7
24–25 years	14	46.7
25 years above	3	10.0

Table 48.2 The student responsibility towards the use of PjBL

No	Items	<i>m</i>
1	I wish to fulfill the task given	4.57
2	I will make enough effort to reach various information sources	4.47
3	I will consult with fellow student or teacher when I didn't understand	4.40
4	I must play an important role in my own learning	4.40
5	I am wiling to accept any challenges in this course by follow the project requirements	4.37
6	I am preferred to have a discussion forum with my peer members/group member	4.33
7	I am wiling to be evaluated	4.30

m mean

Table 48.3 Instructional support in teaching and learning process

No	Items	<i>m</i>
8	The instructor encourages me to express my ideas clearly	4.67
9	The instructor encourages me to use various information sources	4.53
10	The instructor provides me with a positive feedback	4.50
11	The instructor asks me how to arrive at the solution with what steps and process involve	4.23
12	The instructor considers my performance during the problem solving process	4.13
13	The instructor provides me with a negative feedback	3.03

m mean

providing a positive feedback ($M=4.50$). The prompt and feedback will directed the learners to arrive at the solution with a step and process ($M=4.23$). This strategies, to avoid learners received a tacit knowledge, which could prevent them for the articulation their own reasoning processes. However, some of the learners believe that negative feedback ($M=3.03$) will give an implication whether its good or differ (Table 48.3).

48.4.4 Instructional Methodology

Based on this findings, the learners much prefer to have a discussion forum with peer members ($M=4.57$) and expecting to achieve more in gaining knowledge ($M=4.47$). The learners show a positive acceptance to working on a project ($M=4.40$) and wiling to follow the project requirement ($M=4.40$) but in condition the instructional methodology must suit to them ($M=4.37$). The instructional should able to provide and portray their skills ($M=4.33$) and the resources allowing them satisfy the need of requirements ($M=4.30$) (Table 48.4).

Table 48.4 PjBL as instructional methodology

No	Items	<i>m</i>
14	I much prefer to have a discussion forum with my peer members/group member	4.57
15	I am expecting to achieve more in this course than I think	4.47
16	I am willing to accept any challenges in this course by follow the project requirements	4.40
17	I am enjoying working on a project, if it is authentic	4.40
18	I am willing the instructional methodology in this course must be able to suit the way I like to learn	4.37
19	The instructional methodology is able provide me with enough scope to display my skills	4.33
20	The resources must be allowing me to satisfy the course requirements	4.30

m mean

48.4.5 Course and Instructor

This construct is to examine the implementation of the course and instructor using PjBL. The findings show that, well prepared course content ($M=4.47$) and assessment ($M=4.43$) should be linked and aligned with the instructional objectives. The goal should be designed clearly ($M=4.43$) and conducted accordingly ($M=4.40$). The bright and clear two-ways communication ($M=4.33$) will offered many opportunities for participation in the course ($M=4.27$). In PjBL, the course will be design relate with a real-life context, so the learners are more please and happy if the instructor shares any innovations about the course ($M=4.32$) to supplied a resources and set a benchmark ($M=4.20$). In learning process, the instructor have to be more attractive and creative to use a various support tools ($M=4.13$) and techniques ($M=4.10$) to achieve the learning outcome (Table 48.5).

48.4.6 Student Interaction and Collaboration

Based on this findings, the successful of PjBL can be determine when student show a positive interaction and collaboration to sustain the momentum of the learning process. The ideal part of PjBL, the learners will learn to respect others ($M=4.53$) and collaborate with the ideas ($M=4.43$). The forum discussion is ways to helps others ($M=4.40$) and the response and feedback is very useful ($M=4.30$) to improve their project. Hence, this forum discussion will trained them to think, rethink and post a quality questions and answer ($M=4.27$). This strategy will helps learners to focus on the central issues and achieve the goals and complete the task given ($M=4.27$) (Table 48.6).

Table 48.5 Course and instructor relationship

No	Items	<i>m</i>
21	The instructor is well prepared for the lessons	4.47
22	Assessment is prepared in parallel with the course content	4.43
23	The instructor adds a value to the ideas	4.43
24	The course goal is briefly explain at the beginning of the task	4.43
25	The course must be conducted according to the explain plan	4.40
26	I am able to communicate with the instructor	4.33
27	I am being offered with individual opportunities (project, presentation, discussion, etc.) for participation in the course	4.27
28	The language used for delivering instruction is clear	4.27
29	The instructor shares any innovations about the course content with me	4.23
30	Sufficient information is supplied about accommodating resources	4.20
31	I am able to get a feedback on the course activities	4.13
32	The instructor used various methods whenever necessary throughout the course	4.13
33	The instructor used various tools whenever necessary throughout the course	4.13
34	The instructor used various techniques whenever necessary throughout the course	4.10

m mean

Table 48.6 Student interaction and collaboration in learning process

No	Items	<i>m</i>
35	I will respect other's ideas in my group	4.53
36	I am able to collaborate with the other members of my group	4.43
37	I am able to discuss my idea with the other members of my group	4.40
38	I am able to read other posting about the course is very useful	4.30
39	I find the ability to post questions	4.27
40	The setting of learning goals help me to focus on what needed to be achieved	4.27
41	I am being able to collaborate in my group in practical sessions is very helpful	4.20

m mean

48.5 Conclusion and Implication

Based on this findings, there are several points of discussion:

48.5.1 *Appropriate Instructional Methodology*

The true fact is younger learners lack self-directed. In reflect, instructional methodology is to avoid potential detrimental effects to the learners who under-prepared. The facilitator should identify the learners' current cognitive capabilities and their experiences with PBL to devise reasonable expectations of their development of self-directed learning skills. The learner's was occupied with a self-directed skills is

able to be independent and responsible to satisfy the learning needs. The reasoning questions and deeper understanding of the task given will make them become more resourceful and knowledgeable.

The projects will not only allowed them to work individually but also with peers to share, helps and support the learning environment. Despite, PjBL ecosiste, was emphasized the ability to solve and comprehend the problem, its allowed the learner's become more realistic and matured with the unstructured and authentic problem. The set of skills infused in PjBL also stated in Project-based Learning Blueprint by Ministry of Education (2006) emphasizing higher order thinking attributes as a key to facilitate meaningful and real-life learning.

48.5.2 Course and Instructor

The instructor should start identify the real life problems within the context and then select one problem that best affords the results. The selected PjBL problem needs to be appealing to the learners to keep them motivated. Learning goals and objectives guide instructor to outline the depth of content and, consequently, provide a body and structure for aligning the scope of the problem with the curriculum standards (Trafton and Midgett 2001).

In considering and specifying learning goals and objectives, the facilitator or instructor should focus on domain knowledge. Domain knowledge afforded by the problem, the instructor should analyze the concepts, principles, procedures (Sugrue 1995), and factual information that evolve around the most accepted interpretation of the problem/case, hypothesis, and solution to the problem. Notably, with PjBL, learners have equal opportunities of learning by doing which enable them to enhance critical skills, engage with the problem and shape the learning process (Doppelt 2003). So, it can be safely said that learners who undergo PjBL is absorbed into a system of assessment that focus on learners performance (Corcoran et al. 2004).

48.5.3 Interaction and Collaboration

The PjBL actually test learners metacognitive skills to evaluation of difference sources, resolution of conflicting viewpoints, and extension of the learning experience to be possibly adapted in a daily life. Reflection of PjBL is a major idea of having this as a strategy. Learners might be able to demonstrate on the meaning, importance, and use of learned materials. The design of the reflecting component should focus on; (1) acquisition of all the necessary knowledge, (2) adequate depth of study, (3) effective and efficient research methods, (4) logical and effective reasoning processes, (5) conceptual integration of knowledge and (6) effective problem solving strategies.

48.6 Limitations and Future Research

The current study still has its limitation in whereas the samples not cater the whole population of a Social Science and Humanities cluster. This study could benefit the early stage on justifying the reliability of the instrument. Therefore, there is a need the instrument to be tested to make sure it's reliable and could be use in the actual fieldwork. The current study still has it limitation in term of sampling techniques. Therefore, for future study, it is very important to determine preferable sampling techniques to match with the requirement and represent the population of the study.

References

- Albion, P. R. (1998). Problem-based learning as a multimedia design framework in teacher education. *Educational Administration Abstracts*, 36(4), 411–568
- Barrows, H. S. (1986). A taxonomy of problem-based learning methods. *Medical Education*, 20, 481–486.
- Barrows, H. S. (1996). Problem-based learning in medicine and beyond: A brief overview. In L. Wilkerson & H. Gilselaers (Eds.), *Bringing problem-based learning to higher education: Theory and practice*. San Francisco: Jossey-Bass.
- Barrows, H. S., & Tamblyn, R. M. (1980). *Problem-based learning*. New York: Springer.
- Boud, D. (1985). *Problem-based learning in perspective. Problem-based learning in education for the professions*. Higher Education Research Society of Australasia.
- Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition of learning. *Educational Researcher*, 18, 32–42.
- Chin-Hung, L., Shu-Ching, Y., & Chin-Chi, L. (2013). Support as a mediator of the impact of cognitive load on students' E-portfolio learning outcomes. *Social Behavior & Personality: An International Journal*, 41(1), 17–30. doi:10.2224/Sbp.2013.41.1.17.
- Corcoran, P. B., Walker, K. E., & Wals, A. E. J. (2004). Case studies, make-your-case studies, and case stories: A critique of case-study methodology in sustainability in higher education. *Environmental Education Research*, 10(1).
- DeFabio, R. (1993). *Characteristics of student performance as factors in portfolio assessment*. ERIC document reproduction service no. ED 355556
- De Graaff, E., & Kolmos, A. (2002). Characteristics of problem-based learning. *International Journal of Engineering Education*, 19(5), 657–662. DEST.
- Dolmans, D. H. J. M., & Schmidt, H. G. (1994). What drives the student in problem-based learning? *Medical Education*, 28, 372–380.
- Doppelt, Y. (2003). Implementation and assessment of project-based learning. *International Journal of Technology and Design Education*, 10(12), 255–272.
- Dunlap, J. C., & Grabinger, R. S. (1996). Rich environments for active learning in the higher education classroom. In B. G. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 65–82). Englewood Cliffs: Educational Technology Publications. Farnsworth.
- Educational Technology Division Ministry of Education. (2006). *Project-based learning handbook*. Communications and Training Sector Smart Educational Development Educational Technology Division Ministry of Education.
- Embi, M. A. (2011). *E-learning in Malaysian higher education institutions: Status, trends and challenges*. Ministry of Higher Education.

- Gikandi, J. W., Morrow, D. D., & Davis, N. E. (2011). Online formative assessment in higher education: A review of the literature. *Computers & Education*, 57(4), 2333–2351. doi:10.1016/j.compedu.2011.06.004.
- Jametz, K. (1994). Making sure that assessment improves performance. *Educational Leadership*, 51(6), 55–57.
- Kamin, C. S., O’Sullivan, P. S., Younger, M., & Deterding, R. (2001). Measuring critical thinking in problem-based learning discourse. *Teaching and Learning in Medicine*, 13(1), 27–35.
- Kaufman, D. M., & Holmes, D. B. (1998). The relationship of tutors’ content expertise to interventions and perceptions in a PBL medical curriculum. *Medical Education*, 32, 255–261.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs: Prentice Hall.
- Lave, J. (1993). The practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context*. Cambridge: Cambridge University Press.
- Mahmood, T., & Hafeez, K. (2013). Performance assessment of an e-learning software system for sustainability. *International Journal of Quality and Service Sciences*, 5(2), 208–229.
- Nuutila, E., Törmä, S., & Malmi, L. (2005). Pbl and computer programming — The seven steps method with adaptations. *Computer Science Education*, 15(2), 123–142.
- Perkins, D. N., & Salomon, G. (1989). Are cognitive skill context-bound? *Educational Researcher*, 18(1), 16–25. Perrenet.
- Piaget, J. (1952). *The origins of intelligence in children*. New York: International Universities Press.
- Reushle, S. E. (2005). *Inquiry into a transformative approach to professional development for online educators*. Toowoomba: University of Southern Queensland.
- Ryberg, T., Koottatep, S., Pengchai, P., & Dirckinck-Holmfeld, L. (2006). Conditions for productive learning in networked learning environments: A case study from the VO@NET project. *Studies in Continuing Education*, 28(2), 151–170.
- Savin-Baden, M. (2003). *Facilitating problem-based learning: Illuminating perspectives*. Berkshire: SRHE and Open University Press.
- Schon, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass. Schrage.
- Spiro, R. J., Coulson, R. L., Feltovich, P., & Anderson, D. K. (1988). Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains. In *Tenth annual conference of the cognitive science society* (pp. 375–383). Hillsdale: Erlbaum. Stanley.
- Sugrue, B. (1995). A theory-based framework for assessing domain specific problem solving ability. *Educational Measurement: Issues and Practice*, 14(3), 29–36.
- Thomas, J. W. (2000). *A review of research on project-based learning*. <http://www.autodesk.com/foundation>. [18 July 2013].
- Thomas, K. R., Lamson, S., & King, A. (2001). *Training teacher candidates to create web-based electronic professional portfolios*. Paper presented at Central Missouri State University’s Department of Curriculum and Instruction. Retrieved from the ERIC database.
- Tillema, H. H. (1998). Design and validity of a portfolio instrument for professional training. *Studies in Educational Evaluation*, 24(3), 263–278.
- Trafton, P. R., & Midgett, C. (2001). Learning through problems: A powerful approach to teaching mathematics. *Teaching Children Mathematics*, 7, 532–536.
- Vygotsky, L. S. (1979). The genesis of higher mental functions. In V. J. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 144–188). New York: Sharpe Inc. Wallace.
- Wilson, G. (2004). Online interaction impacts on learning: Teaching the teachers to teach online. *Australasian Journal of Educational Technology*, 20(1), 33–48.
- Woelfel, K., Murray, K., & Page, M. (2014). Electronic portfolios for professional educators – Graduate students and instructors. *International Journal Of Instructional Media*, 37(2), 175–183.

Chapter 49

Effectiveness of Computerized Homework Implementation in Thermodynamics: Correlation Between Doing the Homework and the Grade

Mohd Azree Idris, T.M. Indra Mahlia, Nur Irmawati Om, Ibrahim Hussein, and Mohamad Ruslan Jamil

Abstract The objective of the implementation is to gauge the effectiveness of computerized homework in improving students' understandings of Thermodynamics, and to investigate the correlation between the scores attained in computerized homework and the overall grade achieved by the students in Thermodynamics. There were two sections of MEHB213 Thermodynamics I offered during Special Semester 2013/2014. Section 1 with 63 students used the computerized homework while the other section (Section 2, 60 students) continued with the normal manual homework. The computerized homework did not utilize the commercial software available in the market, instead it was developed at College of Engineering, UNITEN. The computerized homework system is a MATLAB and PHP based program and resides on Apache Web server. MATLAB generates the questions and randomize the variables, while PHP displays the contents on the web. The database used for the system is MySQL. The manual homework assigned for the subject had been replaced by the computerized homework in order to give a fast feedback to the students and to reduce the time engaged by lecturers to mark the homework. The answers submitted by students in computerized homework were automatically graded by the system, and they would be immediately notified whether the answers given were correct or not. The students could access the computerized homework at

M.A. Idris (✉) • T.M.I. Mahlia • N.I. Om • I. Hussein
Department of Mechanical Engineering, College of Engineering,
Universiti Tenaga Nasional, KM7, Jalan Kajang-Puchong, Kajang,
43009 Selangor, Malaysia
e-mail: azree@uniten.edu.my

M.R. Jamil
IT & Multimedia Services, Universiti Tenaga Nasional,
KM7, Jalan Kajang-Puchong, Kajang, 43009 Selangor, Malaysia

anytime throughout the semester. The questions were arranged according to chapters and the time to release each question could be set in the system. The result from this study shows there is a direct correlation between doing the computerized homework and the improved grades in Thermodynamics I. 90.4 % of students from Section 1 who used the computerized homework passed the subject while the section which did not use the system had 56.7 % passing grade.

Keywords Computerized homework • Skills • Thermodynamics

49.1 Introduction

Students pursuing degree in Mechanical Engineering and Electrical Engineering at UNITEN will take Thermodynamics I in the third semester of their programs. This course provides the basic fundamental of thermodynamics for engineering application and problem solving. The knowledge and skills gained in the course serve as the foundation for later courses. Students completing Thermodynamics I will have the ability to analyze thermodynamics properties of pure substances and its applications to steam and refrigeration cycles and their related systems. The past records in the College indicated that students who failed this subject and other fundamental courses like Circuits Analysis I, Advanced Calculus and Differential Equations, often would leave the department and the university because they did not have strong foundations for subsequent courses. To ensure that the students are prepared with strong fundamentals in Thermodynamics, various teaching and learning approaches have been employed and one of them is through computerized homework. For Special Semester 2013/2014, two sections were offered for Thermodynamics I and 63 students enrolled in Section 1 while another 60 students were in Section 2. This was a short semester covering 8 weeks only unlike normal semester which had 14 weeks of classes. The objective of the implementation is to gauge the effectiveness of computerized homework in improving students' understandings of Thermodynamics, and to investigate the correlation between the scores attained in computerized homework and the overall grade achieved by the students in Thermodynamics.

Lim and Morris (2009) observed that varying the delivery methods in teaching can increase students' satisfaction from the learning experience as well as their learning outcomes. Mehrabian et al. (2014) presented that creative innovation in content delivery and instructional methods is the key success to an effective online learning environment. It is important that students get a faster feedback to the homework assigned to them. Chickering and Gamson (1987) underline the 'Seven Principles for Good Practice In Undergraduate Education' and one of them is giving a prompt feedback. A swift response will allow the students to quickly gauge their understanding of a certain topic. The manual method of assigning homework will

take some times for the students to get a feedback. Many materials covered in Thermodynamics I are new to students since they do not have or learn similar subjects during high schools or foundations. Mason and Grove (2002) reported that about 30 % of teachers' time in Great Britain is devoted to marking. Dziuban et al. (2004) in a 3-year study between the face-to-face, fully online, and mixed teaching methods of face-to-face and fully online, found that mixed teaching always give better success rates than the other two methods.

49.2 Computerized Homework

The paper-and-pencil problems assigned at the end of the chapter are replaced with an online system over the World Wide Web, administered by a web server at College of Engineering, UNITEN. The purpose of computerized homework is to enhance the knowledge gained by the students in the classrooms. This setting has a mixture of online learning and face-to-face communication in the classrooms, Rovai and Jordan (2004). The questions for Thermodynamics I computerized homework are from the textbook and previous years' exams. Questions may include images and schematic diagrams, and they can be objective or subjective types of questions. Questions are divided into separate chapters to make it easier for students to do the homework and revision based on the materials that have been covered in the class. The system will generate randomize values for the variables used in each question, and therefore the answer to each question will be different from one student to another. The system is hosted at COEOnline, a student portal for College of Engineering at Universiti Tenaga Nasional (UNITEN.) When a student logs in into the system, the questions for each chapter will be generated for him/her. The student can access the online computerized homework from COEOnline around the clock.

Computerized homework is a MATLAB and PHP based program and resides on Apache Web server. MATLAB generates the questions and randomize the variables, while PHP displays the contents on the web. The database used for the system is MySQL.

49.2.1 Implementation

There were two sections of MEHB213 Thermodynamics I offered during Special Semester 2013/2014. One section used the computerized homework and the other section continued with the normal manual homework. There were 93 questions in the computerized homework covering 10 chapters. Figure 49.1 shows an example of a question in the computerized homework.

Following is an example of MATLAB code to generate a question in computerized homework:

```

id = deblank(student_id);
id_add = (str2num((id(length(id)-1:length(id)))));
xrandom = id_add;
T1 = 80+id_add;
load SteamTable1
counter = 1;
while 1
    if T(counter) >= T1
        break;
    end
    counter = counter + 1;
end
y = T1;
y2 = T(counter);
y1 = T(counter-1);
x2 = hf(counter);
x1 = hf(counter-1);
x = finterpolate(x1,x2,y,y1,y2);
h1 = x;

T1 = 20;
counter = 1;
while 1
    if T(counter) >= T1
        break;
    end
    counter = counter + 1;
end
y = T1;
y2 = T(counter);
y1 = T(counter-1);
x2 = hf(counter);
x1 = hf(counter-1);
x = finterpolate(x1,x2,y,y1,y2);
h2 = x;

mdot1 = 0.5;
mdot2 = (h1-h3)/(h3-h2)*mdot1
betul = mdot2

```

One of the most important skills in Thermodynamics that the students must possess is the ability to read the steam tables for properties like pressure, temperature, volume and energy for water, refrigerant and ideal gases. One part of the computerized homework program is a drill on the steam tables. Figure 49.2 shows a sample question on steam tables. The MATLAB code to generate the question for steam tables drilling exercise is given in the Appendix.

An insulated piston-cylinder device contains 9 L of saturated liquid water at a constant pressure of 200 kPa. Water is stirred by a paddle wheel while a current of 7 A flows for 57 min through a resistor placed in the water. If 34 % of the liquid is evaporated during this constant-pressure process and the paddle-wheel work amounts to 470 kJ, determine the voltage of the source. (Note: 1 kJ/s = 1000 VA)

Voltage = _____.

Fig. 49.1 An example of Thermodynamics question in computerized homework

The pure substance for all the questions on Steam Table is WATER.
 You need to answer correctly 50 questions on Steam Table. The counter will reset to zero for any wrong answer.

04:33

1. You need to type one of the followings for the phase description.
1. Compressed Liquid
2. Saturated Liquid
3. Saturated Mixture
4. Saturated Vapor
5. Superheated Vapor

T = 225 oC, v = 0.078405 m³/kg
 Phase description (1/2/3/4/5): _____

Fig. 49.2 An example of Thermodynamics question in computerized homework

Another feature of the computerized homework is an email notification sent to all students in the class every time a new question is successfully answered by a student.

49.3 Results and Analysis

The objective of the study was to check whether the computerized homework would give an impact on students overall grades for Thermodynamics I. The average CGPA of students in Section 1 and Section 2 were checked at the beginning of the semester to confirm that the students began almost at the same par in terms of academic standing. The average CGPA for Section 1 and Section 2 were 2.71 and 2.51 with a standard deviation of 0.56 and 0.46 respectively. Students in Section 1 used the computerized homework system while for Section 2 the students continued with the normal manual method of doing the homework.

Table 49.1 shows the distribution of grades for Thermodynamics I and the corresponding average computerized homework marks. The table indicates that students who score higher marks in the computerized homework gets better results in the subject. The data in Table 49.1 is translated into a graph in Fig. 49.3, which shows the grades obtained by students for Section 1 and the number of computerized homework questions that had been answered by them. The coefficient of determination for the linear regression is $R^2=0.992$. The graph for the computerized homework shows a pattern of improving grades with the number of questions answered by the students. 90.4 % of students from Section 1 passed the subject (D or better) while for Section 2 the percentage was 56.7 %.

49.4 Conclusion

In the past various teaching approaches had been adopted to tackle the relatively higher failure rates in Thermodynamics I compared to other subjects taken by engineering students at UNITEN. The difficulty faced by the students in Thermodynamics I because many concepts learned in the subject are new to them unlike Mathematics which they had many years of exposure in high schools and foundations. Computerized homework is introduced so that the students have the chance to work

Table 49.1 The grades for students and the corresponding average computerized homework marks

Grade	No. of students	Average computerized homework mark (%)
A	6	94.3
B	18	84.1
C	24	64.4
D	9	48.3
E	6	30.1

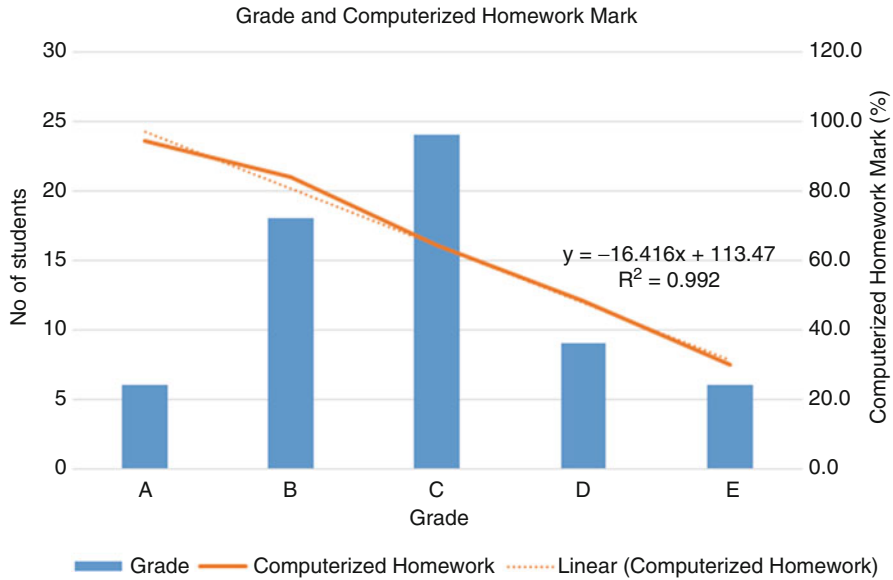


Fig. 49.3 Correlation between grades and computerized homework marks

on more problems on Thermodynamics and at the same time get a prompt feedback on the answers that they have submitted. The result from this study shows there is a direct correlation between doing the computerized homework and the improved grades in Thermodynamics I. The study was implemented during the Special Semester which was much shorter than normal semester but the result was encouraging. The participation rate of the students in doing the computerized homework was high; only two students did not do the computerized homework, and more than 56 % of the students had answered at least 80 % of the questions. 90.4 % of students from Section 1 who used the computerized homework passed the subject while the section which did not use the system had 56.7 % passing grade. Various teaching methods had been employed by College of Engineering, UNITEN, to tackle the higher failure rate in Thermodynamics I. The implementation of computerized homework in the subject shows a promising result since there is a direct correlation between doing the computerized homework and a better grade in the subject. The computerized homework can be extended to more Thermodynamics I sections in the future, and to expand the system to other subjects.

Appendix

```

%% MATLAB Code for Steam Table Computerized Homework
%%
cheq = 0;
simulate = 2;
masuk = 0;
n=1;
load TableSteam;
out = 0; k = zeros(1,15); cc = 1;
rk = 1;
while out == 0
    cari = 0;
    while cari == 0
        nx = ceil(rand*15);
        if k(nx) == 0
            k(nx) = 1;
            cari = 1;
        end
    end
end
clc;
xT = floor(ceil(rand*374)/10)*10;
x = ceil(rand*20000);

if x > 22090
    fprintf('Pressure exceeds the saturation pressure. \n');
    pause
else
    for j = 1:length(T)
        if x == Psat(j)
            y = j-1;
            r = 0;
            break;
        elseif Psat(j) > x
            Psat(j);
            y = j-2;
            r = 1;
            break;
        end
    end
end
end

x = Psat(j);

if x <= 22090
    if r == 0
        T(y+1);
        Tc = T(y+1);
        vfc = vf(y+1);
        vgc = vg(y+1);
        ufc = uf(y+1);
        ufgc = ufg(y+1);
        ugc = ug(y+1);
        hfc = hf(y+1);
        hfgc = hfg(y+1);
        hgc = hg(y+1);
        ssfc = ssf(y+1);
        sfgc = sfg(y+1);
        sgc = sg(y+1);
    else
        a = Psat(y+1);
        b = Psat(y+2);
    end
end

```

```

cT = T(y+1);
dT = T(y+2);
Tc = (x-a)/(b-a)*(dT-cT)+cT;

cvf = vf(y+1);
dvf = vf(y+2);
vfc = (x-a)/(b-a)*(dvf-cvf)+cvf;

cvg = vg(y+1);
dvg = vg(y+2);
vgc = (x-a)/(b-a)*(dvg-cvg)+cvg;

cuf = uf(y+1);
duf = uf(y+2);
ufc = (x-a)/(b-a)*(duf-cuf)+cuf;

cufg = ufg(y+1);
dufg = ufg(y+2);
ufgc = (x-a)/(b-a)*(dufg-cufg)+cufg;

cug = ug(y+1);
dug = ug(y+2);
ugc = (x-a)/(b-a)*(dug-cug)+cug;

chf = hf(y+1);
dhf = hf(y+2);
hfc = (x-a)/(b-a)*(dhf-chf)+chf;

chfg = hfg(y+1);
dhfg = hfg(y+2);
hfgc = (x-a)/(b-a)*(dhfg-chfg)+chfg;

chg = hg(y+1);
dhg = hg(y+2);
hgc = (x-a)/(b-a)*(dhg-chg)+chg;

cssf = ssf(y+1);
dssf = ssf(y+2);
ssfc = (x-a)/(b-a)*(dssf-cssf)+cssf;

csfg = sfg(y+1);
dsfg = sfg(y+2);
sfgc = (x-a)/(b-a)*(dsfg-csfg)+csfg;

csg = sg(y+1);
dsg = sg(y+2);
sgc = (x-a)/(b-a)*(dsg-csg)+csg;

end
fprintf('\n');
xambil = ceil(rand()*4);
if nx <= 3
    xT = Tc;
    if xambil == 1
        xv = ceil(rand*8)/10*(vgc-vfc)+vfc;
    elseif xambil == 2
        xv = ceil(rand*8)/10*(ugc-ufc)+ufc;
    elseif xambil == 3
        xv = ceil(rand*8)/10*(hgc-hfc)+hfc;
    elseif xambil == 4
        xv = ceil(rand*8)/10*(sgc-ssfc)+ssfc;
    end
    jawab_desc = 'Saturated mixture'
    jawab = '3';
elseif nx <= 6
    xT = Tc;
    if xambil == 1
        xv = vfc;

```

```

elseif xambil == 2
    xv = ufc;
elseif xambil == 3
    xv = hfc;
elseif xambil == 4
    xv = ssfc;
end
jawab_desc = 'Saturated liquid'
jawab = '2';
elseif nx <= 9
    xT = Tc;
    if xambil == 1
        xv = vgc;
    elseif xambil == 2
        xv = ugc;
    elseif xambil == 3
        xv = hgc;
    elseif xambil == 4
        xv = sgc;
    end
    jawab_desc = 'Saturated vapor'
    jawab = '4';
elseif nx <= 12
    xT = Tc;
    if xambil == 1
        xv = vgc + rand*vgc;
    elseif xambil == 2
        xv = ugc + rand*ugc;
    elseif xambil == 3
        xv = hgc + rand*hgc;
    elseif xambil == 4
        xv = sgc + rand*sgc;
    end
    jawab_desc = 'Superheated vapor'
    jawab = '5';
else
    xT = Tc;
    if xambil == 1
        xv = vfc - rand*vfc;
    elseif xambil == 2
        xv = ufc - rand*ufc;
    elseif xambil == 3
        xv = hfc - rand*hfc;
    elseif xambil == 4
        xv = ssfc - rand*ssfc;
    end
    jawab_desc = 'Compressed liquid'
    jawab = '1';
end

Tdiff = (Tc-xT)/Tc*100;

jawab_desc
xshow = round(rand*10);
if (xshow > 5)
    if xambil == 1
        krandom = ['T = ' num2str(xT) ' oC, v = ' num2str(xv) ' m3/kg']
    elseif xambil == 2
        krandom = ['T = ' num2str(xT) ' oC, u = ' num2str(xv) ' kJ/kg']
    elseif xambil == 3
        krandom = ['T = ' num2str(xT) ' oC, h = ' num2str(xv) ' kJ/kg']
    elseif xambil == 4
        krandom = ['T = ' num2str(xT) ' oC, s = ' num2str(xv) ' kJ/kg.K']
    end
else
    if xambil == 1
        krandom = ['P = ' num2str(x) ' kPa, v = ' num2str(xv) ' m3/kg']

```

```

elseif xambil == 2
    krandom = ['P = ' num2str(x) ' kPa, u = ' num2str(xv) ' kJ/kg']
elseif xambil == 3
    krandom = ['P = ' num2str(x) ' kPa, h = ' num2str(xv) ' kJ/kg']
elseif xambil == 4
    krandom = ['P = ' num2str(x) ' kPa, s = ' num2str(xv) ' kJ/kg.K']
end
end

if simulate == 2
    fprintf('Phase description : %s \n', deblank(jawab));
    xjawab = [lower(jawab) blanks(50-length(jawab))];
    betul = jawab;
    pause(1);
else
    xjawab = input('Phase description : ','s');
end
xjawab = [lower(xjawab) blanks(50-length(xjawab))];
if xjawab == [lower(jawab) blanks(50-length(jawab))]
    if cheq == 3
        fplay;
    end
else
    fprintf('Wrong \n');
    xwrong = input('Press any key to continue ...');
    cc = 0;
    k = zeros(1,15);
end
end
if sum(k) == 15
    h2(n,1) = 10;
    out = 1;
else
    cc = cc + 1;
end
out = 1;
end
end

```

References

- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *The Wingspread Journal*, 9(2), special insert. Reprinted from AAHE Bulletin, 39(7), 3–7. <http://www.aahea.org/bulletins/articles/sevenprinciples1987.htm>
- Dziuban, C., Hartman, J., & Moskal, P. (2004). *Blended learning*. Retrieved from: <http://www.educause.edu>
- Lim, D. H., & Morris, M. L. (2009). Learner and instructional factors influencing learning outcomes within a blended learning environment. *Educational Technology & Society*, 12(4), 282–293.
- Mason, O., & Grove-Stephenson, I. (2002). Automated free text marking with paperless school. In M. Danson (Ed.), *Proceedings of the sixth international computer assisted assessment conference*. Loughborough: Loughborough University.
- Mehrabian, A., Buchanan, W.W., & Rahrooh, A. (2014, April). Innovation is the name of the game: A case study of an online course in engineering and technology. In *Proceedings 2014 ASEE Gulf-southwest section conference*. Tulane University: New Orleans.
- Rovai, A. P., & Jordan, H. P. (2004). Blended learning and sense of community: A comparative analysis with traditional and fully online graduate courses. *International Review of Research in Open and Distance Learning*, 5(2). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/192/274>

Chapter 50

Academic Dishonesty Among Business Students: A Descriptive Study of Plagiarism Behavior

Norashikin Hussein, Syezreen Dalina Rusdi, and Siti Sarah Mohamad

Abstract The advents of technology have reshaped the way people live, work and communicate. This high-tech development is also observed in the process of teaching and learning especially in higher learning institution. Aligned with the use of technology in institutions of higher education, a growing concern of academic dishonesty issue has emerged. This paper aims to investigate the reasons students engaged in plagiarism and their level of awareness towards plagiarism activity. A total of 99 sets of questionnaires were collected from students of a degree business program in a public university in Malaysia. The findings indicate that the level of awareness among students on plagiarism is high. However, that does not stop them from engaging with plagiarism having easy access of the internet and the fact that they have a habit of doing last minute work. Different perceptions between genders on plagiarism were also investigated and discussed.

Keywords Academic dishonesty • Business students • Plagiarism

50.1 Introduction

The world today is driven by technologies that become practical for its communications, its economy and ever more its daily organization (Risquez et al. 2011). This high-tech development is also observed in the process of teaching and learning especially in higher learning institutions. The appropriate use of information and communication technology in the area of education makes teaching and learning

N. Hussein (✉) • S.D. Rusdi
Faculty of Business Management, University Teknologi MARA,
42300 Puncak Alam, Malaysia
e-mail: shikin6320@salam.uitm.edu.my

S.S. Mohamad
Faculty of Business Management, University Teknologi MARA,
18500 Machang, Malaysia

more worthy, by improving the learning effectiveness as well as adding another perspective to learning that was not previously available (Hartley 2007). Aligned with the use of technology in institutions of higher education, a growing concern of academic dishonesty issue has emerged. One of the global matters related to academic dishonesty infecting many academic institutions is plagiarism.

Academic plagiarism become more intensified today than ever as the growth of the Internet has opened up opportunities for students to cheat. It has made available a much wider number of web-based sources, facilitating the purchase or “cut-and-paste” of appropriate materials which encourage plagiarism (Sterngold 2004). In addition to technological advancement that changed the face of education, changing attitudes toward what constitutes acceptable behaviour in the business world have been suggested also as contributing toward a decline in student honesty, particularly with respect to business students (Brimble and Stevenson-Clarke 2005). This is in conjunction with Collins (2000) that most studies did find that business students tend to be even less ethically sensitive and have more lenient attitude towards what contribute to cheating behaviour (Klein et al. 2007). Thus, it is crucial to find verification on plagiarism activities among undergraduates especially involving business students as these students are future business leader (Iberahim et al. 2012).

Another issue not entirely settled is the question of which student groups are prone to plagiarising university assignment (Walker 2010) and whether they are aware of such misconduct. This involves various demographic parameters for instance age, gender and levels of academic have been shown to be important variables (Bennett 2005; Bradinova 2006; Brimble and Stevenson-Clarke 2005; Park 2003; Nadelson 2007; Perry 2010). Much research has been carried out across the globe but less evidence found on plagiarism act in Asian countries especially in Malaysian context. Therefore, the purpose of this study is to investigate the level of awareness towards plagiarism activity and the reasons of engaging in the misconduct. Awareness level between genders on plagiarism were also explored and discussed.

50.2 Literature Review

50.2.1 Awareness of Plagiarism

The subject of plagiarism, that is a wrongful appropriation and stealing of another author’s language, thoughts, ideas or expressions and representation of them as one’s own original work is not something novel to academic community (Carroll 2004). Hussin and Ismail (2013) identified three types of plagiarism that include verbal plagiarism in which the speaker uses lines from a text without acknowledging the source (Park 2003), plagiarism in writing (Auer and Krupar 2001) and lastly, the internet or digital plagiarism (Scanlon and Neumann 2002). Among these three, the most common type of plagiarism is the lifting of information or ideas from a source text without acknowledging the source (Park 2003). It is easy for a student to paraphrase another author’s ideas without appropriately crediting the source, in the

pursuit of higher grades, and such activity is frequently attributable to desperation, often caused by procrastination or plain laziness (Smith et al. 2007).

In discussing the issue of plagiarism, the critical point to take into account is that the idea of the matter varies across countries and differs according to academic levels (Rezanejad and Rezaei 2013), let alone the cause of doing it. Not even aware of the act of plagiarism is another issue. In a study of 2,600 third level students, McCabe et al. (2008) found that just over 40 % of respondents believed that cutting and pasting from the internet is either trivial plagiaristic behaviour or not plagiaristic at all. Similarly, it was found that students also engaged in 'patch-writing', where several pieces of borrowed material is patched together as a result of lack of understanding of the content (Howard 1995). Howard (1995) suggests that patch-writing may be perceived as an attempt to re-synthesize difficult material and, in terms of learning, may actually assist understanding ability. Thus, in this context, students view that as a legitimate study strategy whereas academics see patch-writing as plagiarism (Wilkinson 2009).

When students do not fully understand what constitutes plagiarism, or what the penalties for its detection are, they may not see it as a problem (Smith et al. 2007). Although most students tend to understand that academic misconduct is wrong, if they perceive that as tolerable is different from the faculty or university, their understanding of the wrongness of academic misconduct doesn't help much (Kwong et al. 2010).

50.2.2 Reasons of Plagiarism

The reasons why students resorted to plagiarism differ. First-year university students arrive at university from diverse educational, geographic and cultural backgrounds and perceive referencing primarily as an issue of compliance for it has often not been taught explicitly, or within a discipline context prior to tertiary education (Perry 2010). Hayes and Introna (2005) note that the education system in most countries is based on learning and assessment that typically focus on the content of a text book. Thus, it does not seem to be easy for students to be critical or to raise their own opinions, leading to copying ideas from books and other sources instead especially if they are new to the English language (Handa and Power 2005; Zimmerman 2012).

Dawson (2004) analysed the relationship between the type and difficulty of the task set and the likelihood of committing plagiarism. Other research found that most of the students plagiarize to get the right answers of their questions, ultimately to achieve high grades in their studies instead of getting expertise in their subjects of study (Ramzan et al. 2012). Apart from that, peer pressures also have a strong effect on students' perception of the act of plagiarism (Ellahi et al. 2013). Deckert (1993) suggested one of the possible reasons for students in Hong Kong to plagiarise is that students had little familiarity with the Western notion of plagiarism and poor ability to recognize it. Similarly, students understand they should not copy words without

referencing, but fail to grasp the rationale as the reasons are not explicit and often cloaked in unfamiliar academic language (Stagg et al. 2013).

50.2.3 Awareness of Plagiarism Between Genders

Gender awareness on plagiarism is reported vastly in the literature. In the early 1990s, the literature in the area of academic dishonesty largely focuses on the influence of 'individual' factors such as genders and age group upon such dishonesty where earlier studies suggested that cheating was more prevalent among males, more recent studies suggest female cheating is increasing, possibly due to a convergence of role requirements among males and females in the academic environment (Brimble and Stevenson-Clarke 2005).

In contradiction, Becker and Ulstad (2007) explained that females may try to avoid the negative consequences of cheating and tend toward ethical action. Unlike males, focusing more on perceived benefits of cheating and less on the consequences of being caught and therefore more prone to plagiarising in particular (Park 2003). Whitley (2001) found out that there was no significant difference between genders whereas Bradinova (2006) explained that in examining the possible effects of gender on students' understanding of the meaning of plagiarism, the analysis of the sample does not show any significant differences between male and female students' views about what constitutes plagiarism but female students express slightly higher opinions on plagiarism.

50.3 Methodology

A quantitative survey was undertaken to serve the purpose of this study. Questionnaires with 23 items were distributed to a total of 99 students from a business degree program in one of a public universities in Malaysia ranging from semester 1 to semester 5. The questionnaires were divided into three parts. The first part of the survey required respondents to rate the importance of seven items to measure the level of awareness whereas the second section contained 16 potential reasons related to academic plagiarism. Respondent rated the given statements using 5-point likert scale with 1 indicating strongly disagree and 5 indicating strongly agree. The instruments were adapted from various literatures (Comas-Forgas and Sureda-Negre 2010; Ramzan et al. 2012) which have been proven to be reliable and valid. Given the sensitive nature of the questions, all responses provided by the respondents were guaranteed of anonymity. The last part of the questionnaires involved collecting demographic information of the respondents. All data were analyzed using Statistical Package for Social Sciences (SPSS).

50.4 Results

50.4.1 Demographic Profiles

The profile of respondent focuses on gender, age, semester and previous education. Among 99 respondents, male constitutes of 23.2 % and female constitutes of 76.8 % involving students from semester 1 until semester 4. Since the semester 1 students are the first batch in the course, hence there is no student for semester 2. Details of the demographic profiles are as per Table 50.1.

50.4.2 Level of Awareness

The following findings indicate the level of awareness among business students pertaining to plagiarism. The result shows that most students aware that plagiarism is wrong with the highest value of mean, $\mu=4.33$ ($SD=0.67$). In general, students have a clear understanding on the meaning of plagiarism and that the act of copying from materials without crediting the sources constitute plagiarism since the mean value are both high ($\mu=4.18$, $SD=0.84$ and $\mu=4.05$, $SD=0.8$ respectively). Similarly, they realized that they will be caught ($\mu=3.91$, $SD=0.74$) and face serious consequences if they violated the plagiarism policy ($\mu=3.72$, $SD=0.82$). Nevertheless, they rated moderately on the effectiveness of the university and the faculty in catching those who engaged in plagiarism (Table 50.2).

Table 50.1 Demographic profiles of respondents

Variables	Frequency	%
Gender		
Male	23	23.2
Female	76	76.8
Age		
<20 years	9	9.1
>20 years	90	90.9
Semester		
Semester 1	9	9.1
Semester 3	30	30.3
Semester 4	29	29.3
Semester 5	31	31.3

Table 50.2 Level of awareness among students

Awareness	Mean	Std. deviation
I understand plagiarism to be wrong	4.33	.670
I understand the meaning of plagiarism	4.18	.837
Copying from a book without crediting the source constitutes plagiarism	4.05	.800
If a student violates the plagiarism policy he/she will be caught	3.91	.744
If a student violates the plagiarism policy he/she face serious consequences	3.72	.821
University is effective at catching students who plagiarize	3.28	.869
Our faculty is effective at catching students who plagiarize	3.26	.910

50.4.3 Reasons for Plagiarism

Concerning with the reasons of plagiarism, the findings indicate that the ease of access offered by the Internet to find information is the main reason for students resorted to plagiarism ($\mu=4.23$, $SD=0.69$) followed by the habit of doing things last minute work ($\mu=4.12$, $SD=0.78$) and the assignment to be done is very complicated ($\mu=3.90$, $SD=0.78$). Based on the result below, students moderately agreed that they plagiarize due to the feeling that they did not learn anything from the assignment ($\mu=4.23$, $SD=0.69$). At the second lowest rank of reason leading to plagiarism is the feeling that lecturers to whom the assignment is to be submitted do not thoroughly read the assignments ($\mu=4.23$, $SD=0.69$) and the least is that it would be hard for the lecturer to find out they had copied ($\mu=4.23$, $SD=0.69$) (Table 50.3).

50.4.4 Level of Awareness Between Genders

In assessing the level of awareness between genders, the analysis of the sample stipulated in Table 50.4 shows that both female and male understand that plagiarism is wrong with both values of mean are high ($\mu=4.34$, $SD=0.66$ and $\mu=4.30$, $SD=0.70$ respectively). An examination of gender influences on crediting sources showed that females were more likely to proper cite the authors ($\mu=4.12$, $SD=0.75$), whereas males were more likely not to have the citation of sources ($\mu=3.83$, $SD=0.94$). For other variables, it was observed that there was no significant difference between male and female. However, from the result, females express slightly higher opinion on all variables than males indicating that the tendency for males to plagiarize is higher.

Table 50.3 Reasons for plagiarism

Reasons	Mean	Std. deviation
Ease of access offered by the Internet to find information	4.23	.697
The habit of doing things at the last minute	4.12	.786
The assignment to be done is very complicated	3.90	.789
A lack of time	3.83	.809
Many assignments have to be submitted over a short period of time	3.78	.932
A belief that copying something from the Internet is not bad, because everything on the internet is public	3.70	.788
The fact that the assignment set is eminently theoretical	3.69	.649
It's easier, simpler and more comfortable than doing the work yourself	3.65	.812
Because other classmates do it	3.64	.963
The fact that the assignment has a reduced weight in the final grade of the subject	3.51	.787
Students do not know how to do academic assignments	3.44	.895
You get a higher grade than by doing the assignment yourself	3.37	.864
The knowledge or feeling that the lecturer to whom the assignment is to be submitted is not very skilled at using the internet	3.10	.920
A feeling that you do not learn anything from the assignments	3.09	.905
Due to the knowledge or feeling that the lecturer to whom the assignment is to be submitted does not thoroughly read the assignments	3.07	.786
A feeling that it would be hard for the lecturer to find out they had copied	3.03	1.035

Table 50.4 Level of awareness between genders

Variables	Gender	N	Mean	Std. deviation
I understand the meaning of plagiarism	Male	23	3.96	1.065
	Female	76	4.25	.751
I understand plagiarism to be wrong	Male	23	4.30	.703
	Female	76	4.34	.664
Copying from a book without crediting the source constitutes plagiarism	Male	23	3.83	.937
	Female	76	4.12	.748
If a student violates the plagiarism policy he/she will be caught	Male	23	4.04	.825
	Female	76	3.87	.718
If a student violates the plagiarism policy he/she will be caught and face serious consequences	Male	23	3.74	.964
	Female	76	3.71	.780
Our faculty is effective at catching students who plagiarize	Male	23	3.22	.902
	Female	76	3.28	.918
University is effective at catching students who plagiarize	Male	23	3.22	.902
	Female	76	3.30	.864

50.5 Discussion and Conclusion

The purpose of this study was to investigate the level of awareness and reasons of plagiarism among business students. Findings reveal that majority of students understand the meaning of plagiarism and fully aware that such act is regarded as a serious misconduct. Moreover, they also realized that serious consequences will follow if they were caught for plagiarism. Despite this awareness, they engage themselves in such act because they thought that the university and even the faculty are less effective in identifying plagiarism act. Smith et al. (2007) agreed that students felt most academics did not want the aggravation of enforcing rules against cheating and plagiarising, so the great majority of students believed that the risk of being caught cheating or plagiarising was quite low. Similarly, Ramzan et al. (2012) expressed that teachers are under pressure to determine whatever they are receiving from the students in terms of assignments and research papers are free of plagiarism or not. Therefore, students prone to plagiarized as the chances of being caught are less (Ramzan et al. 2012).

There is a large literature relating to the reasons contributing to plagiarism. The study suggests that the ease of access offered by the Internet to find information is the main reason for students resorted to plagiarism followed by habit of doing assignment last minute and the complexity of the task. The result is supported by Quah et al. (2012) as they mentioned that the issue of plagiarism is increasing due to the developments in information and communication technology that make various databases, information sources and term papers available for students. At the same line, Devlin and Gray (2007) reported that a lack of time, poor time management, laziness and the ease of copying access provided by the Internet were first order factors to explain this practice.

In the course of various studies of academic honesty, there is no consensus of the influence of gender on plagiarism. The study revealed that there is no significant difference between genders awareness on the subject matter. It is noted that female students provide a slightly higher response or opinion on plagiarism compared to male. Thus, the likelihood for male to plagiarize is higher. This is in line with Straw (2002) appears that males cheat in academic situations more than female students.

To conclude, this study would be an eye opener to the community, university, as well as education sector in Malaysia. The fact that this is a preliminary study, more studies need to be conducted on academic dishonesty specifically on plagiarism issue. In fact, the plagiarism issue should not be taken lightly by the universities as it would lead to negative ethical values among students and further the future manpower of the nation. The results of this study propose further directions for extensive research in future in which robust analysis could be done to explore to what extent the incidence of plagiarism activities in Malaysia. It is also suggested that other respondents' from different program or even other universities be included in future research with a bigger sample size. Lastly, it is suggested that the approach of the study in future to be qualitative as it would also be interesting to explore the proposed actions taken by the universities and ministry in handling plagiarism issue via interview or focus group.

References

- Auer, N. J., & Krupar, E. M. (2001). Mouse click plagiarism: The role of technology in plagiarism and the librarian's role in combating it. *Library Trends*, 49(3), 415–432.
- Becker, D. A., & Ulstad, I. (2007). Gender differences in student ethics: Are females really more ethical? *Plagiary: Cross-Disciplinary Studies in Plagiarism, Fabrication, and Falsification*, 2, 77–91.
- Bennett, R. (2005). Factors associated with student plagiarism in a post-1992 university. *Assessment and Evaluation in Higher Education*, 30, 137–162.
- Bradinova, M. (2006). *Exploring students' and university teachers' perceptions of plagiarism* (151–151 p). ProQuest dissertations and theses.
- Brimble, M., & Stevenson-Clarke, P. (2005). Perceptions of the prevalence and seriousness of academic dishonesty in Australian universities. *The Australia Educational Researcher*, 32(3), 19–44.
- Carroll, J. (2004). Handling student plagiarism: Moving to mainstream. *Brookes E-Journal of Learning and Teaching*, 1, 2.
- Collins, D. (2000). The quest to improve the human condition: The first 1500 articles published in journal of business ethics. *Journal of Business Ethics*, 26(1), 1–73.
- Comas-forgas, R., & Sureda-negre, J. (2010). Academic plagiarism: Explanatory factors from students' perspective. *Journal of Academic Ethics*, 8(3), 217–232.
- Dawson, J. (2004). Plagiarism: What's really going on? In *TL forum (2004). Seeking educational excellence*. Proceedings of the 13th Annual Teaching Learning Forum.
- Deckert, G. (1993). Perspectives on plagiarism from ESL students in Hong Kong. *Journal of Second Language Writing*, 2(2), 131–148.
- Devlin, M., & Gray, K. (2007). In their own words: A qualitative study of the reasons Australian university students plagiarize. *Higher Education Research and Development*, 26(2), 181–198.
- Ellahi, A., Mushtaq, R., & Khan, M. B. (2013). Multi campus investigation of academic dishonesty in higher education of Pakistan. *International Journal of Educational Management*, 27(6), 647–666.
- Handa, N., & Power, C. (2005). Land and discover! A case study investigating the cultural context of plagiarism. *Journal of University Teaching & Learning Practice*, 2(3), 64–84.
- Hartley, J. (2007). Teaching, learning and new technology: A review for teachers. *British Journal of Educational Technology*, 38(1), 42–62.
- Hayes, N., & Introna, L. (2005). Cultural values, plagiarism, and fairness: When plagiarism gets in the way of learning. *Ethics & Behavior*, 15(3), 213–231.
- Howard, R. M. (1995). Plagiarism, authorship, and the academic death penalty. *College English*, 57(7), 788–806.
- Hussin, H., & Ismail, M. (2013). Plagiarism: More than meets the eye. *Advances in Language and Literary Studies*, 4(2), 148–151.
- Iberahim, H., Hussein, N., Samat, N., Noordin, F., & Daud, N. (2012). Academic dishonesty: Why business students participate in these practices? *Procedia Sosial and Behavioral Sciences*, 90, 152–156.
- Klein, A. H., Lecenburg, M. N., Mckendall, M., & Mothersell, W. (2007). Cheating during the college years: How do business school students compare. *Journal of Business Ethics*, 21, 197–206.
- Kwong, T., Ng, H. M., Mark, K. P., & Wong, E. (2010). Students' and faculty's perception of academic integrity in Hong Kong. *Campus-Wide Information Systems*, 27(5), 341–355.
- McCabe, D. L., Feghali, T., & Abdallah, H. (2008). Academic dishonesty in the Middle East: Individual and contextual factors. *Research in Higher Education*, 49, 451–467.
- Nadelson, S. (2007). Academic misconduct by university students: Faculty perceptions and responses. *Plagiary: Cross-Disciplinary Studies in Plagiarism, Fabrication, and Falsification*, 2, 67–76.

- Park, C. (2003). In other (people's) words: Plagiarism by university students –literature and lessons. *Assessment and Evaluation in Higher Education*, 28(5), 471–488.
- Perry, B. (2010). Exploring academic misconduct: Some insights into student behaviour. *Active Learning in Higher Education*, 11(2), 97–108.
- Quah, C. H., Stewart, N., & Lee, J. W. C. (2012). Attitudes of business students' toward plagiarism. *Journal of Academic Ethics*, 10, 185–199.
- Ramzan, M., Munir, M. A., Siddique, N., & Asif, M. (2012). Awareness about plagiarism amongst university students in Pakistan. *Higher Education*, 64(1), 73–84.
- Rezanejad, A., & Rezaei, S. (2013). Academic dishonesty at universities: The case of plagiarism among Iranian language students. *Journal of Academic Ethics*, 11(4), 275–295.
- Risquez, A., O'Dwyer, M., & Ledwith, A. (2011). Technology enhanced learning and plagiarism in entrepreneurship education. *Education + Training*, 53(8/9), 750–761.
- Scanlon, P. M., & Neumann, D. R. (2002). Internet plagiarism among college students. *Journal of College Student Development*, 43, 374–385.
- Smith, M., Ghazali, N., & Noor Minhad, S. F. (2007). Attitudes towards plagiarism among undergraduate accounting students: Malaysian evidence. *Asian Review of Accounting*, 15(2), 122–146.
- Stagg, A., Kimmins, L., & Pavlovski, N. (2013). Academic style with substance. *The Electronic Library*, 31(4), 452–464.
- Sterngold, A. (2004). Confronting plagiarism: How conventional teaching invites cyber cheating. *Change*, 36(3), 16–21.
- Straw, D. (2002). The plagiarism of generation “why not?”. *Community College Week*, 14(24), 4ñ7.
- Walker, J. (2010). Measuring plagiarism: Researching what students do, not what they say they do. *Studies in Higher Education*, 35(1), 41–59.
- Whitley, B. E. (2001). Gender differences in affective responses to having cheated: The mediating role of attitudes. *Ethics & Behavior*, 11, 249–259.
- Wilkinson, J. (2009). Staff and student perceptions of plagiarism and cheating. *International Journal of Teaching and Learning in Higher Education*, 13(2), 98–105.
- Zimmerman, M. (2012). Plagiarism and international students in academic libraries. *New Library World*, 113(5/6), 290–299.

Chapter 51

Innovating ESL Listening Instructions Through the Learners' Perspectives on Technology-Enhanced Blended Learning

Sofwah Md Nawi and Gurnam Kaur Sidhu

Abstract Research has indicated that listening is often neglected in the Malaysian ESL classroom for various pedagogical and logistical reasons. Conveniently, these problems can be addressed through the introduction of an innovative technology-enhanced blended learning approach which allows listening skills to be nurtured in a combined learning mode; both in and out of class. While adopting the blended approach is viable to improve the current ESL listening instructions, there is also lack of pedagogical understanding to help instructors, especially in the Malaysian tertiary institutions, to effectively implement the blended model for ESL listening purposes. To better understand what affects listening instructions in the blended setting, this paper discusses the perspectives of Diploma-level students undergoing a newly implemented blended learning course for ESL listening. A semi-structured interview was conducted to identify the learners' preferences in the combined face-to-face and technology-enhanced language learning environment. Data from the interview suggests that in order to effectively implement the blended listening instructions, the learners' language proficiency level and motivation for self-learning need to be considered. Findings from this study would serve as a stepping stone to enhance blended ESL listening instructions via the blended approach in the future.

Keywords Blended learning • CALL • ESL listening • ESL classrooms

S. Md Nawi (✉)

Faculty of Education, UniversitiTeknologi MARA (UiTM),
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia

Academy of Language Studies, UniversitiTeknologi MARA (UiTM) Cawangan Johor,
KM 12, Jalan Muar, 85009 Segamat, Johor, Malaysia
e-mail: sofwahnawi@gmail.com

G.K. Sidhu

Faculty of Education, Asian Centre for Research on University Learning and Teaching,
Universiti Teknologi MARA, Campus Section 17,
40200 Shah Alam, Selangor, Malaysia

51.1 Introduction

Being considered the second (L2) and global language in Malaysia, learners in institutions of higher learning, who are learning English as a Second language (ESL, hereafter), are expected to possess competent communicative abilities. However, the traditional, teacher-centred and exam-oriented learning gives more emphasis towards the development of their literacy skills (i.e. reading and writing) as opposed to communicative skills (i.e. listening and speaking). Though listening is vital in building language proficiency (Bozorgian 2012), it is a ‘Cinderella’ skill that “teachers take for granted and students spend less time on actively developing” (Flowerdew and Miller 2012, p. 225). In the classroom, learners obtained little exposure to listening as it was found to be the least employed task, the least focussed upon, the least effectively developed and the least tested skill (Hassan and Selamat 2002). Learners with varying proficiency levels also received limited individualised instructions that is crucial to developing L2 listening, since in many tertiary institutions, learners are placed in large and heterogeneous classes (Yang et al. 2013). Conversely, outside of classroom hours, learners were found to have little motivation to practise this skill (Davis 2013).

To address the existing issues in the current approach towards teaching ESL listening, innovative ideas are indispensable in order to help learners be more engaged in active and meaningful listening endeavours. One concept that is increasingly gaining the attention in many tertiary institutions these days is the technology-enhanced language learning in the blended environment, or can be referred to as blended language learning. In its simplest term, blended language learning can be defined as a combination of two learning modes via instructional technology (e.g. computer-assisted language learning or CALL) and face-to-face (F2F) classroom learning (Grgurović 2010). The idea behind a blended instruction is that learning can be enhanced beyond formal face-to-face meetings. Even with limited classroom instructional hours, listening lessons or practices can still be carried out in non face-to-face mode. Instructions too may cater to the learners’ individual needs and language proficiency. This is made plausible by the plethora of resources available via CALL or online that can supplement the learners with an endless amount and variety of practice.

This notion of an innovative learning environment has prompted the development of a new integrated English language course focusing on ESL listening for undergraduates in a Malaysian public higher learning institution. In this course, learners are exposed to a mixed learning mode; 2 h of F2F mode in the classroom, 2 h of F2F CALL instructions in the language lab and 4–6 h of CALL or online activities in non face-to-face (NF2F) mode outside of classroom hours, per week. A commercial textbook on listening (with a CD-ROM) as well as a module combining web-based resources were used for instructional purposes.

This change in approach could be seen as a paradigm shift to the current listening instructions in the Malaysian ESL classroom in an effort to promote learning beyond the classrooms and to improve the learners’ communicative ability. Nonetheless,

despite the increasing implementation in higher learning institutions, there is insufficient information on what blended instructions entail, especially where ESL listening is concerned. As listening remains under-explored both in the field of second language acquisition (Bozorgian 2012) and technology-enhanced language learning (Genc-Ersoy and Ersoy 2013), the lack of information on what transpires in a blended L2 listening instruction may pose difficulties to the learners. Since a 'blend' may be subjected to the permutations of technologies, pedagogies and contexts of learning (Smythe 2012), knowing how blended learning instructions affect learners is crucial to an effective implementation (Kobayashi and Little 2011). Thus, the instructional design conditions and the kinds of learners blended learning is most effective with, need to be looked into (Diaz and Brown 2010 as cited in York et al. 2014) This notion is supported by Mirriahi and Alonzo (2015), that "it is important to consider students' preferences to ensure a positive perception and acceptance of the technologies used for offering flexible and blended learning initiatives" (p. 1).

This study, which is part of an ongoing thesis, will address this issue by investigating the learners' perspectives of the newly implemented blended learning course for ESL listening by closely examining their acceptance of the blended learning components for ESL listening purposes. The preliminary findings of this study are reported based on the learners' behavioural preferences i.e. their perceived usefulness and ease of use in learning with the blended listening instructions as well as the factors that influence their preferences.

51.2 Review of Literature

Blended learning is said to complement the needs of the current generation of learners (Renes and Strange 2010) who are known as the digital natives and can help to promote learner autonomy by means of self-learning. In the long run, it can help prepare learners with the technology-related skills required of a twenty-first century learner (Yang et al. 2013) in accordance to the demands of today's job employment as well as the national educational goals set in the Malaysia Education Blueprint 2013–2015 (Ministry of Education Malaysia 2012).

In the context of L2 education, previous studies have supplemented the literature with a considerable understanding on how blended learning has affected language learners. These include positive learner perceptions or satisfactions (Kobayashi and Little 2011; Lee and Lee 2012) and increased language performance (Kobayashi and Little 2011; Lee and Lee 2012; Yang et al. 2013). As for the potentials of blended learning for L2 listening skills, learners generally do have positive regards towards its usage. Though limited in number, findings from empirical and qualitative studies have provided some insights into what occurs in the blended listening classroom. The authors have explored the use of online CALL materials, virtual learning environment (VLE) or learning management system (LMS) and web-based platforms in several international L2 learning contexts. In these studies, listening was either contextualised in an integrated language course (Kobayashi and Little

2011), combined with speaking skills (Grgurović 2010; Yang et al 2013) or was a standalone instruction (Lee and Lee 2012). Other studies practical for blended listening instructions may include findings from research in second or foreign language listening, that were specified on the use of CALL applications such as podcasts (Hasan and Tan 2012) to supplement listening activities, which were found to have motivating effects and can increase student engagement. Through these studies, a number of components for blended language learning were identified, which are comparable to the framework developed by Neumeier (2005). These components can serve as a guideline to help identify the learners' preferences in learning with the blended instructions for L2 listening purposes.

51.2.1 Blended Language Learning Framework (Neumeier 2005)

Out of the many frameworks available for evaluating a blended learning model, Neumeier's (2005) can be deemed most suitable for language learning context (Grgurović 2010). The framework consists of six parameters; mode, model of integration, distribution of learning content and objectives, language teaching methods, involvement of learning subjects and location.

The first parameter, mode, refers to the instructions that influence the learning process and experience i.e. the F2F and CALL modes. The second parameter, which is called the model of integration, are characterised by the sequencing of the individual F2F and CALL modes and their level of integration. The level of integration dictates the obligatory nature of the learning activities carried out in blended learning. Neumeier (2005) suggests that activities in F2F meetings be made obligatory while some online activities can be made optional. However, Grgurovic (2010) sees giving such flexibility as presuming that students are autonomous learners who will take responsibility for their own learning which may not be practical. While highly motivated and highly autonomous learners may be willing to participate in out-of-class learning activities, blended learning instructors could face problems with the more traditional, teacher-centred learners.

The third parameter deals with the distribution of learning content, objectives and purpose. In planning or assessing a blended language course, the distribution can either be parallel or isolated. 'Parallel' means that both the teaching and learning process can happen in F2F or NF2F modes while 'isolated' means they are done in separate modes. Parallel distribution was utilised in this study as it allows the language skill to be incorporated and practiced in both modes (Neumeier 2005). Language functions can be taught in two ways: online presentation and face-to-face practice or face-to-face introduction and online practice (p. 171). Parameter four concerns the teaching methods used in both F2F and NF2F modes. While there is flexibility for the instructors in choosing and changing teaching methods in F2F meetings, the challenge is in selecting effective method of instructions for the CALL mode. Neumeier (2005) claims that the selection is more restricted in CALL mode

and Grgurovic (2010) suggests using the communicative approach to counterbalance the limitation (p. 8).

The fifth parameter is the involvement of learning subjects, which is described by the interactions between the learners, teachers and computers. Blended learning enables many interactional patterns to be formed to ensure that learning extends beyond F2F meetings. Computer-mediated communication (CMC), for instance, can facilitate multiple interactions e.g. between the learners themselves, the learners and teachers as well as the learners and the computers. However, while the options may vary, the instructions must be manageable for both teachers and learners. Other than interactional patterns, blended learning also demands more diverse roles from both teachers and learners. The choices of interaction and the use of technology to facilitate learning greatly influence the roles played by teachers and learners (Neumeier 2005). Ideally, what is expected in the blended environment is for teachers to play a more facilitative role while the learners become more active in assuming their learning responsibilities.

The final parameter refers to the location in which learning takes place. Since blended learning integrates two learning environment, the location in which learners meet the instructors may take place at common venues (e.g. in the classroom, in the lab, at home) and virtual spaces afforded by mobile technology (e.g. mobile phones, tablet). The flexibility of learning spaces should be reflected in the blended learning design to enable learners to maximise their learning potentials.

51.2.2 Blended Learning Components for L2 Listening

While the framework by Neumeier can serve as a guideline for evaluating a blended instructional model, input from the previous studies in blended L2 listening instructions is also required. After a close examination of the findings reported in various blended L2 listening instructional settings, several components that help shape the learners' view of learning in the blended mode were identified.

First of all, it was found that the ESL learners in two studies attributed their improvement in listening competency with a blended model that has clear integration of the learning content between F2F and CALL learning mode (Grgurović 2010) and provides a “systematically sustained opportunity to improve their listening skills” (Lee and Lee 2012, p. 85). These were achieved by having a clear distinction between the learning objectives in F2F and CALL modes. For instance, the learning content in Grgurovic's blended model was distributed in a parallel distribution (e.g. introduction in F2F mode and practice in CALL mode and vice versa) (Grgurovic 2010) or while the model in Lee and Lee's study was constructed by specifying the online and offline tasks for pre, while and post listening activities. Thus, a clear and systematic integration of learning content in the mixed learning mode is one of the key elements in implementing blended listening instructions. This is concurrent with the parameters in the blended language learning framework proposed by Neumeier (2005), which places a great emphasis on integration of

mode. Such is crucial as it may affect student retention in the blended course, as evident in Stracke (2007 as cited in Whittaker 2013).

Another key dimension was the role played by the instructor. In the findings reported by Hong and Samimy (2010), the respondents were found to have a positive attitude towards the use of CALL instructions in response to the instructors' active use of CALL modes. At the same time, the learners' computer literacy skills (Hong and Samimy 2010; Kobayashi and Little 2011) may also have a considerable effect on their learning in the technology-enhanced environment. Thus, scaffolding from the instructors is required by facilitating the learners to transition into the blended learning mode (Mendieta Aguilar 2012; Grgurović 2010). In identifying the roles of the individuals involved in blended learning, the issue of learner autonomy comes to play (Grgurović 2010; Reinders and Hubbard 2013). In Neumeier's (2005) framework, it was stipulated that more diverse roles are needed from both instructors and learners. Unlike in traditional teacher-centred instructions, learners need to assume more control over their own learning while the instructor provides assistance in making it happen.

If the findings from previous studies are of any indications, one plausible way of promoting learner autonomy is by maximising and manipulating the use of the technological resources in the blended mode. This is to allow learners a certain degree of control over their learning process and motivate them to continue doing so outside of formal classroom meetings. Taking example of the respondents in Hasan and Tan (2012), they find that using podcasts his helpful in enhancing their listening proficiency as they associate the tool's effectiveness to three factors; enjoyment, ease of access and flexibility in learning time and location. It can be said that these three elements are important to engage learners in taking responsibilities of their own learning, as they are given choices on how to approach listening in a variety of ways (Motteram and Sharma 2009). Similarly, the online students in Kobayashi and Little (2011) perceived that the online components for listening practices were useful for reviewing the classes they had attended as they "could work at their own pace, listen an unlimited number of times, and use pause and replay" (p. 110). Thus, by selecting tools or resources that can allow learners to work at their own pace, can help promote autonomous learning among blended learners.

However, instructors are cautioned that developing autonomous learners is not as simple as merely providing them access to these resources (Reinders and Hubbard 2013). In fact, the instructors in Grgurović's (2010) study decided to make all activities in F2F and CALL modes compulsory to ensure that learners complete all the learning tasks given. Thus the decisions made by the instructors i.e. the choice of pedagogy (Smythe 2012) or teaching methods (Neumeier 2005) are vital to motivate the learners in taking charge of their own learning outside of the F2F contact hours.

In summary, the following dimensions can be identified as among the key components of a blended learning model for L2 listening: (a) integration of learning modes and content, (b) diverse roles of instructors and learners, (c) flexible and accessible e-learning resource as well as (d) choice of teaching methods. These

dimensions can be used as a stepping stone to build a blended model that can assist learners in embarking on an innovative learning environment.

51.3 Research Methodology

This case study is part of an on-going thesis that looks into the implementation of an innovative blended learning approach to teach listening in the ESL classroom. However, this paper only focuses on one part of the study which is the learners' attitudinal aspects towards the adoption of the blended learning mode. The case study involved one intact class of 30 students who were enrolled in a first semester Diploma-level course. Forty-five percent of the course design focuses on listening skills. The class underwent a weekly F2F (face-to-face) and NF2F (non-face-to-face) instruction for 14 weeks. They spent approximately 90 min every week for F2F instructions in the classroom and another 90–120 min in the computer lab. The learners were also assigned to NF2F learning hours with CALL instructions for out-of-class learning. A commercial course book which includes a paper textbook and CD-ROM (with textbook software) were used as per the requirement of the course design. ESL listening podcasts and websites with listening practices were also used by the class instructor to supplement out-of-class learning activities. These resources were used to take advantage of the logistical and pedagogical benefits they offer.

On the last day of the course, a semi-structured interview session was conducted by the researcher. The participants were asked about their preferences and satisfaction towards the blended approach especially with regards to the technology-supported instructions used as well as their experience in undergoing the blended mode for learning. Questions for the interview were constructed based on Neumeier's (2005) blended learning framework as well as the components identified as key elements of a blended L2 listening instruction. Six students were selected to participate in the interview. Notes from the interview was recorded and then analysed to identify the learners' preferences in undergoing a blended course for ESL listening. The coding scheme used for data analysis can be found in Table 51.1 below.

51.4 Results and Discussion

To better understand what affects listening instruction in the blended mode, this paper discusses the perspectives of first-year Diploma students in undergoing an innovative blended learning course for ESL listening. Data from the semi-structured interview on learner preferences in learning with the blended instructions suggests that their language proficiency level and motivation for learning has a considerable impact towards their preferences.

Table 51.1 Coding scheme to analyse data from the interview

Category	Code	Response
Types of Technology-Enhanced Listening Activities	1	Web-based activities
	2	Textbook software
	3	Podcasts, vodcasts
	4	Others
Blended learning mode	F	Face-to-face
	N	Non face-to-face
Location	C	Classroom
	L	Language lab
	H	Home/residential college
	O	Others
Instructor's roles	T	Teacher
	Fc	Facilitator
	Oth	Others
Preferences	+	Like
	0	Neutral
	-	Dislike

Table 51.2 Profile of the participants

Participant	Sex	English proficiency level	Competency in using technology
R1	Male	Intermediate	Intermediate user
R2	Male	Advanced	Intermediate user
R3	Male	Low intermediate	Intermediate user
R4	Female	Advanced	Intermediate user
R5	Female	Low intermediate	Intermediate user
R6	Male	Advanced	Intermediate user

51.4.1 Profile of the Participants

To provide a better understanding of the participants, their information is recorded in Table 51.2. The six respondents were randomly selected based on their responses in the TAM survey. Their English proficiency level is determined by their performance in the national public examination, *Sijil Pelajaran Malaysia* (SPM – the Malaysian equivalent to GCE Examination). They were also asked to assess themselves in terms of their competency in using technology since it was deemed important (Hong and Samimy 2010). In terms of experience with blended learning and formal listening instructions, they explained that they have never participated in a blended course prior to this one and they did not receive proper listening instructions, especially involving technology, when they were in secondary school.

51.4.2 *Learner Preferences on the Technology-Enhanced Activities Employed*

The following section discusses the findings obtained from the semi structured interviews with the six respondents. The first part of the discussion takes into account the following dimensions: the integration of learning mode and content as well as the choice of CALL resources for listening in the F2F and NF2F modes. In general, the participants had positive regards towards the use of the technological resources, which they most frequently access via computers. When asked to describe their learning with technology, these were among the reasons given by the participants;

R3: "...we can learn two things in one time ... it will make easier [sic] to learn English."

R4: "...it is my source in learning English. I hardly master English without using technology."

R1: "It give [sic] me more (exposure) in learning English"

R5: "It was (a) good experience learning about listening and using technology. As we know, listening is a bit hard [sic] than reading so we have to use technology to attract people to listen."

The participants' responses are reflective of their self-assessed competency in using technology. Having competency in technology use is vital (Hong and Samimy 2010) as it may influence the learners' perceived ease of use of the technological resources introduced to them.

One trait that the learners highlighted when they were asked to describe the usefulness of the CALL resources is 'enjoyment'. Entertainment activities that they performed on their own such as listening to songs and watching movies are considered useful to them in building their listening skills. While they also responded positively to more other activities like the use of podcasts (e.g. news and short stories) and vodcasts (e.g. talk and documentaries) for CALL tasks, they struggled with the accent and the pace of the native speakers, which to them was "*too fast*". Another type of activity they find useful and easy to use was doing exercises using the textbook software. According to R1, he finds it "*easy to manage*" as it allows him flexibility; "*Of course... I like... I still remember I did the activities when I was on 'Raya' (festive) break at home.*" One activity which the learners were not very keen with was online listening practices on ESL websites (e.g. Randall's ESL Cyber Listening Lab, English Listening Lesson Library Online) but only because they often faced technical difficulties e.g. difficulty to get good Internet access on campus.

In discussing the types of activities preferred, the findings correlate with the 'mode' they perform the activities in. It was found that the learners who favour CALL mode and self-learning activities in NF2F mode have either higher proficiency level or higher learning motivation. It comes to no surprise as previous research has specified that learners need to assume a more autonomous role

(Grgurovic 2010) in the blended mode. The participants with higher proficiency level perceived that computer-based listening activities, especially in the language lab, are more useful for them. Doing these activities lets them accomplish more as they are able to work at their own pace. R2 stated; *“I sometimes had to wait for my friend to finish or help him with the work (in the classroom). I prefer activities in the lab as I can choose what I want to do and like.”* R1, who can be described as highly-motivated, said, *“For me, it is comfortable to do lonely [sic]. It give [sic] me more [exposure]. I feel more comfortable because if I cannot hear the audio clearly, I can replay according to my preference.”*

In contrast, the less proficient learners were more inclined towards classroom activities conducted by the course instructor and do not favour doing self-learning activities and practices as much. One of them said; *“I prefer in the classroom because my English not that good [sic](...) When in class, we more [sic] on discussion.”* – R5. However, it is important to note that one of the respondents, who belongs in the higher proficient group, does not perceive self-learning activities especially in NF2F mode to be highly useful. He said he won't learn so much as he may end up getting distracted like chatting with his friends – R6. However, the participants had a general consensus that the F2F and NF2F activities assigned to them were related. The participants explained that the instructor *“gave similar activities (for F2F and NF2F)”* – R3 and that there is a theme (e.g. festivities) for each weekly lesson. This allows them to connect between the lessons obtained in class with the practices assigned to them in the CALL modes.

Based on the feedback given by the participants, it can be construed that while the learners have positive attitude towards the CALL resources for ESL listening purposes, their behavioural intention and actual usage of the activities assigned to them may vary according to their language proficiency and their motivation for self-learning. Nonetheless, having a theme and a parallel distribution of content throughout the whole course was something they appreciated and felt useful. Consideration of these learner characteristics as well as strategies for integrating the F2F and CALL learning content would be useful in assisting the creation of new and effective blended models (Grgurovic 2010).

51.4.3 Learners' Preferences on Learning Roles and Teaching Methods

The second part of the discussion addresses two other dimensions which are the learning roles and the teaching methods utilised in the blended learning mode. In general, all the participants share the same opinion that, even with all the technological resources available, having a teacher is the catalyst of language learning. As Mendieta Aguilar (2012) states, the success of any learning approach is in the role played by the teacher. However, there are differences in their expectations towards the class instructor. Therefore, this piece of information can be useful for existing

and future ESL blended learning instructors. Much like the findings in Sect. 51.4.2, the participants' language competence and motivation for self-improvement influence their attitude towards learning in the blended mode. In presenting the learners' feedback, the discussion begins with the instructor's roles from the viewpoint of the learners and proceeds to highlighting the factors that instructors need to consider when dealing with blended learning.

First of all, when the participants were asked about their own learning roles in the CALL mode, the less proficient learners displayed teacher-dependency, having opted for the instructor's guide, much like in a traditional ESL classroom. They find it more useful when the instructor provides explanations to them when they do listening activities. *"I prefer with instructor. I need guide [sic]. Guide for my vocab(ulary), for my spelling."* – R5. Another participant mentioned that *"It (is) better with lecturer. First, listen to (the) lecturer then do activities by your own on computer. After that, have a check with friend or lecturer whether the answer (is) correct or wrong."* – R3. The more proficient ones, on the other hand, assumed a more autonomous role and claimed that they prefer having the instructors as facilitators especially whenever they are in the lab. In their opinion, they feel more at ease to seek for the instructor's help only when they face problem. When asked about why they choose not to depend on instructors too much, one participant explained; *"I like it because it depends on us to work it out on ourselves and it gives much more freedom in decision and way of thinking."* – R4. Another participant acknowledged the importance of self-learning and stated that *"...there's no point having the instructor if the student himself don't [sic] want to make effort."* – R1.

The participants were then asked to describe the roles of the instructor in the blended mode. They all agreed that the instructor "turned to lecture mode" when in class (i.e. F2F) but was more facilitative when they are at the lab for F2F CALL meetings. In the NF2F CALL mode, the instructor was described as "quite active" in promoting the use of technology for the learning tasks. The participants cited one example of a listening assignment they are required to post online. However, while the instructor managed to respond and give feedback to the work, it took some time for the evaluation to be uploaded. Overall, they were satisfied with the approach used in CALL mode, though they admitted feeling "a bit disappointed" when the instructor was not able to give timely feedback for their online NF2F tasks. The feedback in this case indicates that the instructor's attitude towards technology use, especially in terms of how actively they use it for teaching and learning, can influence the learners' acceptance of the innovative use of technology. This concurs with Hong and Samimy (2010) whose respondents also reacted positively to the active use of CALL modes by the teachers in their studies.

In terms of teaching approaches, the participants acknowledged the instructor's effort in motivating them to learn, especially outside of formal F2F meetings. For instance, one participant explained that the instructor made sure to relate the instructions to real-life tasks; *"...the lecturer managed to relate the teaching subject to students' everyday experience, thus able to attract our attention."* – R2. By doing so, the instructor managed to help the learners identify the importance of the CALL activities in both F2F and NF2F modes. Nonetheless, majority of the participants

admitted that they expected the learning tasks assigned to them to be made compulsory and more importantly to be graded, be it in F2F or NF2F modes. Much like in traditional instructions, receiving grades, especially for out-of-class learning tasks is a motivational factor for them to actively engage in. However, this also shows their low level of autonomy having associated learning goals with achieving grades.

Other issues that emerged from the interview were on the challenges the learners faced. Although not explicitly asked during the interview, such feedback given by the participants allows the researcher more insights into the factors that may influence their acceptance of the blended instructions. One of the problems voiced out by the participants was the resources used for listening (e.g. podcasts by native speakers). They struggled to understand the native speakers' accent and some speakers spoke too fast for their level. Instructors and curriculum developers alike should be selective of materials that can suit the learners' language competency and cultural background. Perhaps the use of podcasts and other materials from local resources would suit the Malaysian learners better. Other than that, easy access to the tasks assigned to them online is especially crucial for blended learning. Although the learners in this study express favourable attitude towards web-based activities, technical difficulties such as getting good Internet access can hamper their enthusiasm.

To reiterate, the literature places a great emphasis on the integration of the learning mode and the learning content in the blended environment and these depend largely on the instructors' pedagogical choices and the roles they played in the blended setting. The researcher therefore suggests that instructors make careful considerations when exercising their roles in the blended learning mode. In order to make the learners see the connection between F2F and online learning, the instructor needs to endorse the importance of online learning activities as part of the course. One way of doing so is by clearly communicating with the learners of the expectations needed from them as blended learners. Tasks integration is one aspect that Neumeier (2005) emphasized as it can greatly affect how the learners perceive blended learning to be. In the case of Stracke (2007 as cited in Whittaker 2013), learners dropped out of the blended course due to the lack of support from the teachers and a perceived mismatch in the learning component. Lastly, being an active technology user is also another way for the instructor to influence how learners accept innovative learning instructions (Hong and Samimy 2010). Therefore, blended learning instructors need to be ready to transition to the roles specified above.

51.5 Conclusion

This study represented the learners' views of an innovative blended language learning approach for ESL listening. The findings suggest that their preferences on the blended learning components were influenced by their language proficiency level as

well as motivation for self-learning. To a certain extent, their competency in using technology and their level of autonomy may also have influenced their attitude towards the use of the blended learning approach. Therefore, it is suggested that these factors be considered when designing a blended language course. Since the findings are limited to the context of a Malaysian classroom setting with a small number of respondents, future studies on larger scales are needed. Addressing this issue from the perspectives of the blended learning instructors may also yield useful results, as they are the catalyst to a successful blended learning implementation (Mendieta Aguilar 2012).

References

- Bozorgian, H. (2012). Listening skill requires a further look into second/foreign language learning. *International Scholarly Research Network*, 1–10. doi:10.5402/2012/810129.
- Davis, M. (2013). Beyond the classroom: The role of self-guided learning in second language listening and speaking practice. *Studies in Self-Access Learning Journal*, 4(2), 85–95. Retrieved from: <http://sisaljournal.org/archives/june13/davis>
- Flowerdew, J., & Miller, L. (2012). Assessing listening. In C. Coombe, P. Davidson, B. O'Sullivan, & S. Stoyhoff (Eds.), *The Cambridge guide to second language assessment* (pp. 225–233). New York: Cambridge University Press.
- Genc-Ersoy, B., & Ersoy, M. (2013). Technology enhanced language learning: A review and assessment of the literature. *World Conference on Educational Multimedia, Hypermedia and Telecommunications*, 2013(1), 814–819.
- Grgruović, M. (2010). *Technology-enhanced blended language learning in an ESL class: A description of a model and an application of the Diffusion of Innovations theory*. Unpublished doctoral dissertation, Iowa State University.
- Hasan, M.M., & Tan, B. H. (2012). ESL Learners' perception and attitudes towards the use of podcast in developing listening skills. *The English Teacher*, 41(2), 160–173.
- Hassan, F., & Selamat, N. F. (2002). Why aren't students proficient in ESL: The teachers' perspective. *The English Teacher*. Retrieved from <http://www.melta.org.my/ET/2002/wp10.htm>
- Hong, K. H., & Samimy, K. K. (2010). The influence of L2 Teachers' use of CALL modes on language learners reactions to blended learning. *CALICO Journal*, 27(2), 328–348.
- Kobayashi, K., & Little, A. (2011). Learner perceptions on the usefulness of a blended learning EFL program. *JALT CALL Journal*, 7(1), 103–117.
- Lee, J. Y., & Lee, C. H. (2012). Students' perspectives and the effectiveness of blended learning in L2 listening at university level. *Multimedia-Assisted Language Learning*, 15(1), 59–89.
- Mendieta Aguilar, J. A. (2012). Blended learning and the language teacher: a literature review. *Colombian Applied Linguistics Journal*, 14(2), 163–180.
- Ministry of Education Malaysia (2012). *Preliminary report: Malaysia education blueprint (2013–2015)*. Kementerian Pelajaran Malaysia. Retrieved from <http://www4.unescobkk.org/nespap/sites/default/files/Preliminary-Blueprint-ExecSummary>
- Mirriahi, N., & Alonzo, D. (2015). Shedding light on students' technology preferences: Implications for academic development. *Journal of University Teaching & Learning Practice*, 12(1), 6.
- Motteram, G., & Sharma, P. (2009). Blending learning in a Web 2.0 world. *International Journal of Emerging Technologies & Society*, 7(2), 83–96.
- Neumeier, P. (2005). A closer look at blended learning—Parameters for designing a blended learning environment for language teaching and learning. *ReCALL*, 17(02), 163. doi:10.1017/S0958344005000224.

- Reinders, H., & Hubbard, P. (2013). CALL and learner autonomy: Affordances and constraints. In M. Thomas, H. Reinders, & M. Warschauer (Eds.), *Contemporary computer-assisted language learning*. New York: Continuum.
- Reyes, S. L., & Strange, A. T. (2010). Using technology to enhance higher education. *Innovative Higher Education*, 36(3), 203–213. doi:10.1007/s10755-010-9167-3.
- Smythe, M. (2012). Toward a framework for evaluating blended learning. In Brown, M., Hartnett, M. & Stewart, T. (Eds.). *Future challenges, sustainable futures. Proceedings ascilite Wellington 2012*. (pp. 854–858).
- Whittaker, C. (2013). Introduction. In B. Tomlinson & C. Whittaker (Eds.), *Blended learning in english language teaching: Course design and implementation*. London: British Council.
- Yang, Y.-T. C., Chuang, Y.-C., Li, L.-Y., & Tseng, S.-S. (2013). A blended learning environment for individualized English listening and speaking integrating critical thinking. *Computers & Education*, 63, 285–305. doi:10.1016/j.compedu.2012.12.012.
- York, D., Owston, R., Murtha, S., & Finkel, J. (2014, April). *Investigating a blending of classroom instruction with online learning environment in undergraduate education: Students' perspective*. Paper presented at the Annual Meeting of the American Educational Research Association, Philadelphia. Retrieved from: http://www.yorku.ca/rowston/AERA_2014_blended.pdf

Chapter 52

Investigating the Needs for Innovative Online-Based Research Practices in the ESL Classrooms

Noridah Sain, Sofwah Md Nawi, Hema Rosheny Mustafa, and Hazila Kadir

Abstract There is little doubt that the proliferation of computer-based technologies has brought about profound changes to social and educational contexts over the past two decades. In classroom contexts, learners today rely heavily on the Internet as a source of information, often turning to the Internet rather than books when gathering information. This study delves into the need to innovate the teaching of online literacy in higher learning institutions in Malaysia. Highlighting the criticality to develop the necessary Internet research skills is paramount as learners will be left unsupported in developing the literacies they need in the new learning environment if educators fail to recognise this problem. To further investigate the issue at hand, a focus group interview was carried out with instructors from several public universities in Malaysia to investigate their current online-based research practices in ESL classrooms. The findings indicate that majority of the participants agree that online literacy should be taught explicitly in the classroom. The outcome of this study should help in addressing the need to systematically and explicitly develop the skills and knowledge that are necessary for learners to engage in online-based research effectively. This study also puts forward recommendations on how online-based research activities can be innovated in the ESL classroom.

Keywords Online-based research • Online-learning

N. Sain (✉) • S. Md Nawi
Academy of Language Studies, Universiti Teknologi MARA, Johor, Malaysia
e-mail: ms.noridah@gmail.com

H.R. Mustafa
Faculty of Education, University of Tasmania, Newnham 7248, TAS, Australia

Language Academy, Universiti Teknologi Malaysia, Johor Bahru 81000, Johor, Malaysia
e-mail: hema.mustafa@utas.edu.au

H. Kadir
Faculty of Science, Technology and Human Development, Universiti Tun Hussein Onn
Malaysia, Johor, Malaysia

52.1 Introduction

Given the pervasiveness of Internet nowadays, learners and educators alike often refer to the Internet for information and ideas. However, educators “may falsely assume” that because learners “know how to navigate the Internet – that is they know how to point, click, and type – they are also able to comprehend and analyse the information they locate” (Kymes 2007, p. 8). What the educators tend to overlook is that when learners shift to online environments, many conventions found online vary from traditional texts. Online texts are typically multilinear and arranged in a hypertext format, offer means for interaction and unlimited amount of available information as opposed to print texts which are linear, contain a fixed format, constant, and a limited amount of information (ibid). The problem arises when learners are “generally not taught to recognise the expository nature of the information; they do not receive explicit instruction in the conventions and devices employed to direct attention, increase retention, or provide illustration” pertaining to online texts (ibid). Educators should stop treating online comprehension skills to be on the most part the same as traditional comprehension skills (Leu et al. 2009 as cited in Coiro 2011) or “set them aside as technology skills rather than new reading comprehension skills” (Karchmer 2001 as cited in Coiro 2011) because in doing so the learners will be deprived of crucial knowledge in discerning online reading texts.

In response to this problem, this preliminary study explored the use of online-based research activities in the conventional ESL classroom. The study delved into the instructors’ views pertaining to method(s) in teaching online-based research activities and web evaluation criteria. It is hoped that this study will offer deeper understanding of the current online-based research practices that take place in Malaysia which warrant an innovative approach.

52.2 Review of Literature

52.2.1 *Internet as an Open Source of Information*

The open nature of the online environment has made it a resource of mixed quality and standards. Therefore, specific skill-set and critical mindsets are needed when using the Internet, particularly for educational purposes. Compared with traditional information sources, information presented on the Internet is considered to be less reliable, given the obvious absence of editorial control in the online environment (Flanagin and Metzger 2007). The type of information available on the Internet varies from publications which are regulated in much the same way as traditional print genres, such as online newspapers and refereed journals, to texts that have not been screened or edited, composed by any individual who wants to write about the topic (Slaouti 2002). It is the latter practice that receives much criticism for its lack of a professional editor or gatekeeper to monitor the content. As an unregulated source

of information, the burden of evaluating the credibility of information is placed on consumers of the information and it can hamper the learners' learning if they have not been adequately prepared and trained to engage in online texts.

To critically evaluate information in online environment, learners have to operate on a higher state of alertness compared to operating in the conventional environment (Stapleton 2003). When the learners attempt to make online inquiry, by contrast, they have to apply new skills to search, locate, and comprehend information within the enormous space that is the Internet, on top of which they have to simultaneously make judgments about the accuracy and validity of the material. It is evident that to operate in online environment with its open accessibility, learners are faced with many additional demands. The lack of editing and vetting processes has not only had an impact on online content but it has also been found to present challenges to readers because of its structure. Because online texts have often undergone less rigorous scrutiny than conventional texts, it is not unusual for users to encounter a Webpage that manifests a blend of both advertising and information (Flanagin and Metzger 2007). These challenges have led educators to think about how to support the development of their learners' skills and capacities and to realise the potential of the Internet in their classrooms.

52.2.2 Internet as a Source of Information in the ESL Classroom

In spite of the integration of various technologies into language classrooms such as the popular Computer Assisted Language Learning (CALL) and Computer Mediated Communication (CMC), the Internet remains an important source of information for the development of online literacies in the twenty-first century in the teaching and learning of languages. This area of study has been the subject of research in various bodies of literature. For example, Stapleton (2003) studied the use of the Internet as a research source in the context of L2 academic writing in Japan. Similarly, Slaouti (2002) examined the use of the Internet as an authentic source of information in an English for Academic Purposes teaching and learning context in the UK. A study was also done where 30 ESL learners from a suburban school in Malaysia, showed improvement in their vocabulary acquisition with the help of the Internet (Mustafa et al. 2012). These studies confirm that the Web has the potential to enhance both teaching and learning in the twenty-first century, which is especially important for language learners in countries such as Malaysia where English is dubbed as the second language.

One of the presumed reasons why research in educational technology has shifted to focus on the use of the Internet as an information repository is that the conceptualisation of 'classrooms' has been broadened by the Internet (Greenhow et al. 2009). The learning space is no longer confined to the classroom, thanks to the proliferation of technology. The Internet has enabled the development of hybrid learning

spaces that combine the physical, traditional classroom and the online virtual learning environment (ibid). Despite being useful as an educational tool, the use of the Web as a source of information places additional demands on students. Kuiper and Volman (2008, p. 242) argued that “The Web as an information source is a tool that can only play an adequate role in students’ learning processes under certain conditions” which they are not accustomed to in traditional forms of education. These demands are largely a consequence of the distinct characteristics of the Internet. Studies show that despite many affordances to assist Internet users, there are still many hindrances that may prevent them from using the Internet successfully due to the nature of online texts.

52.2.3 *Literacy in the Digital Age*

From the perspectives of New Literacies, Leu et al. (2004) considered literacy to be a deictic concept because of the changes in the society over time. This requires the definition of literacy to be updated constantly which has a direct impact on the ‘many capabilities’ required in becoming a literate member. With the emergence of technologies that establish new channels for information on the Internet such as search engines and Webpages, new literacies are also required to effectively exploit their potential. These may be challenging for learners who started their school career with the literacies of paper and pencil but who will encounter the literacies demanded by a much wider variety of information and communication technologies (ICTs). Because of the demands of globalisation, there is an obvious need for Malaysian learners to be competitive within an educated workforce. The body of work that is loosely identified as the New Literacies movement provides an appropriate framework with which to closely investigate this issue and form judgements about the skills and capacities required to be considered a ‘literate’ person in the second decade of the twenty-first century. The “new literacies perspective” will refer to the definition by Leu et al. (2004) which follows:

The new literacies of the Internet and other ICTs include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. These new literacies allow us to use the Internet and other ICTs to identify important questions, locate information, critically evaluate the usefulness of that information, synthesize information to answer those questions, and then communicate the answers to others (p. 1572).

Identifying questions, locating information, evaluating, synthesising, and communicating information with online information necessitates new skills and strategies as compared to the strategies required for traditional text (Coiro and Dobler 2007). Coiro also (2008, p. 14) established four characteristics of an emerging new literacies perspective and these four characteristics below help inform a new, richer understanding of what constitutes technological literacy in today’s society.

First, new technologies for information and communication and new visions for their use require us to bring new potentials to literacy tasks that take place within these technologies. Emerging ICTs necessitate a need for a change in practice to develop proficiencies. Educators must embrace these technologies as a means to enhance motivation and deepen content learning.

Second, new literacies are central to full civic, economic, and personal participation in a world community. ICTs are becoming critical for literacy in our global society and indicate the need for new literacy skills for all students across all nations. Schools are failing to support students in their development of new literacies and online reading comprehension (Leu et al. 2007). Initiatives at the national, federal, and state level must join together to create a shared vision and develop technology competencies among all students.

Third, new literacies are deictic; they rapidly change as defining technologies change. The deictic nature of technology causes individuals to re-examine the term “new.” What is new today is likely to soon be outdated tomorrow making the notion of “fully literate” in every technology unrealistic and unobtainable (Coiro et al. 2008, p. 5). Indeed, most teachers, technologically speaking, will be less literate than their students. This shift in teacher to student relationships requires teachers to reevaluate their roles in online learning environments (Coiro 2009). The deictic nature of technology is difficult for literacy instruction to match; however, we must adapt to the changes to prepare students for tomorrow’s demands (Leu et al. 2004). Last, new literacies are multiple, multimodal, and multifaceted. An examination of collective models of both historical and contemporary reading comprehension is needed to fully understand the complexity of the new literacies perspective. No one single viewpoint can adequately address this expanding framework. The definition of literacy must be expanded to include a variety of perspectives from a variety of research domains. Literacy is no longer solely based on print but rather new forms of communication including a multitude of constructs.

52.3 Methodology

This exploratory research aimed to gather a group of experienced English language instructors to openly and frankly discuss common practices with regard to online-based research activities in Malaysian public institutions of higher learning. Ten ESL instructors participated in a focus group interview that was held during a single one and a half hour session. The researchers served as mediators during the discussion. Questions for the interview were constructed from the review of literature focusing on two main themes; the instructors’ experience and the needs of the students with regards to online reading skills. The recorded responses were transcribed and analysed before they were coded thematically.

52.4 Findings

The following sections report on the discussion that took place with the participants on issues related to online-based research activities in the ESL classroom. Conclusion and recommendation for innovative practices are also made based on what was discussed.

52.4.1 *Profile of the Participants*

Below in Table 52.1 is the profile of the ten instructors involved in the interview. They were all acquaintances and colleagues of the researchers and represented a diverse group in terms of their teaching experience, academic qualifications, and personal teaching philosophy. Convenient-sampling method was used to select the participants. The most experienced one was a lecturer with over 30 years of teaching experience while the least experienced was a language instructor who had 4 years of teaching experience. In terms of qualifications, they ranged from Bachelor's Degree holders to those with post graduate degrees.

52.4.2 *Online Reading Strategies*

The discussion began with our request for the participants to reflect on their teaching experiences at schools and university. One of the first things that was quickly admitted was how poorly equipped they were for teaching online reading comprehension strategies. Looking back at the training they received to become ESL instructors at teacher training colleges and university, the participants recalled lessons on reading methodology but none on online reading. The only thing that came to the minds of the participants was the traditional reading skills that involved the

Table 52.1 Profile of the participants

Participant	Sex	Qualifications	Teaching experience
R1	Female	PhD candidate	14 years
R2	Female	Master's degree	35 years
R3	Female	PhD candidate	13 years
R4	Female	Master's degree	5 years
R5	Female	Master's degree	5 years
R6	Male	Master's degree	7 years
R7	Female	Bachelor degree	5 years
R8	Male	Bachelor degree	4 years
R9	Female	Bachelor degree	4 years
R10	Female	Bachelor degree	4 years

use of skimming, scanning, predicting, analysing and evaluating reading materials. The discussion then turned to what Kymes (2007) describes as “false assumptions” often cited by educators for not teaching online reading strategies. The participants agree that they often assume that the students know how to navigate the Internet simply because they know how to point, click, and type. It is generally regarded that the students are also able to comprehend and analyse the information they locate online. Three participants cited how their students sometimes displayed better mastery in computer and online navigation skills compared to them, enabling them to perceive that these students are able to comprehend and evaluate the information found online, correctly. This assumption can be dangerous because even though our ESL learners may be computer literate they will still have problems coping with digital literacy due to lack of necessary strategies in order to cope with online English texts. If policy makers, practitioners and educators continue to disregard the increasing evidence that new strategies and skills may be required to locate, identify, and analyse information from the Internet, our learners will not be equipped for the future OECD Program for International Student Assessment 2003 as cited in Coiro 2011).

The rest of the participants confessed that they simply treated online reading skills the same as traditional reading skills and since the students have been exposed to reading activities for at least 11 years; they did not bother to teach the reading skills again or expose the students to online reading skills. Furthermore, teaching the students how to read in online environment is not required in the syllabus. As a result, whenever the students need to do online-based activities, the participants would only give their comments when necessary and assisted the students whenever they asked for clarification.

One solution to address the problem of poor reading comprehension among the learners is the learning of metacognitive reading strategy skills. Metacognitive reading strategy ability needs to be focused in language learning and teaching (Ahmadi et al. 2013). The study done by Ahmadi et al. corroborates the view that explicit instruction of metacognitive reading strategies is a feasible tool to enhance learners’ reading comprehension and benefited most from explicit reading instruction supplemented by practice in metacognitive reading strategy activities. After exchanging views, the researchers and the participants agreed that teaching these strategies and adapting them into online-based activities will definitely benefit the students.

52.4.3 Web Evaluation Criteria

The previous discussion explored the current scenario when incorporating online-based activities in the ESL classroom and how the skills and knowledge relevant to the search skills that are essential for students to effectively use the Internet as a source of information were not taught explicitly by the lecturers. This part of the findings will address the second important skill in using the Internet as a research source: the ability to evaluate information retrieved online. The availability and

accessibility of the Web has turned the Internet into an important source of information, and has made it a great research source due to its large repository of information. The fact that the Internet is accessible to anyone who wants to publish online makes it the biggest publishing enterprise in the world, yet editors are nowhere to be found. Allowing access to information which has not been assessed by others is a double-edged sword. On the one hand, students can find information on almost any topic; on the other, they are at risk of encountering incorrect or unreliable information. When asked whether their students had problems identifying and selecting relevant information required in the online-based activities, four out of six participants voiced their concern over students' reliance on Wikipedia. These students believe that Wikipedia is very reliable and can be their main source of information. Surprisingly, the participants also revealed how quite a number of students were not able to distinguish the value and significance of websites ending with ".edu," and ".gov" as compared to the usual website ending with ".com." Most of the times, the participants noticed that their students would choose the first three to five results that appeared on their search engines display page as their reference for online-based research activities.

Lecturers should pay more attention to this situation considering this open access nature of the Internet requires users to evaluate and filter the information they encounter, which has clear pedagogical consequences. Generally, the absence of editors for the information published on the Internet signifies that each user needs to assume the role of an editor to assess the information they retrieved. Kuiper and Volman (2008) pointed out that even though readers need to adopt a critical stance towards information presented in any medium, the use of the Internet requires much higher-level skills. The lack of regulation on the Internet is clearly the main factor to the demand of critical thinking skills. Stapleton (2005) indicated that because information on the Internet has not undergone the same editing process as conventional sources, it must be treated with tremendous caution. Moreover, it has been shown that users barely evaluate the reliability or authority of the information. In the studies in which students were found to evaluate the information retrieved from the Internet, it was also found that the criteria used for this evaluation were often inappropriate. Some of the criteria used to evaluate the Web include equating quantity with quality (Agosto 2002), regarding all the results of a search engine as being of good quality which suggest that it is difficult for learners to assess and evaluate Webpages. For learners operating in a second language, this task is particularly difficult (Stapleton 2005). Therefore, an innovative approach in dealing with this matter is imperative.

52.5 Conclusion and Recommendation

It has been consistently shown in this study that students of today's technology require an innovative learning environment that supports the development of twenty-first century skills in order to be considered as a literate member of a global

community (Coiro 2009). It was also evident from the review of empirical studies that the traditional approaches to literacy learning are not adequate to equip today's students with the necessary skills (Coiro 2003). Even though some of these skills can be transferred from traditional comprehension skills and built on, many of them are exclusive to the online environment. It has been established by the studies from the New Literacies perspective that this shift in literacy requires new ways of instruction to meet the needs of the students (Kingsley 2011).

In view of this, the researchers believe that direct and explicit instruction during online-based activities is crucial in the students' learning process. Dwyer (2010) found that explicit instruction increased the students' success in implementing the new skills and strategies of ICTs and confirmed that such is important to help students make the connection between their prior knowledge and the online search tasks. It also showed that their online literacies ability, especially self-regulated strategies, had improved as a result of strategy instruction. As the evaluation of Webpages has become recognised as a critical component of online literacy, therefore it is of paramount importance that the educators expose their learners to web evaluation criteria. To evaluate the accuracy of the information, learners' corroboration skills of checking facts from one source against other independent sources need to be developed. Because of the openly shared content nature of the Internet, corroboration is considered an important skill for twenty-first century research because it enables learners to verify the accuracy of information before relying on it too heavily (Britt and Gabrys 2001). This skill also helps learners to identify agreed-upon facts, events and interpretations and to weigh them appropriately. The process of corroboration involves searching for documents on the same topic for comparison. This can be done by the use of sources mentioned on the current Webpage or by collecting bibliographies on the topic area.

Britt and Gabrys (2001) suggested that learners should also develop 'sourcing' skills. Sourcing involves firstly the act of 'noticing' – foregrounding salient information within an online document and then applying evaluative skills to assess the credibility of the information in the document. Two important components of sourcing are identification of the source, such as the author's name, affiliation and credentials, and the evaluation of its trustworthiness, which includes the author's motives and purpose for writing the document. Identifying the source of Webpages can be difficult for online readers. Unlike printed documents with standard information about the author, a number of online documents do not explicitly provide author information, or this information can only be accessed through an extended link. Even though this study drew on a different perspective to conceptualise the skills which are necessary to evaluate an information source, it did provide for an expanded understanding of the importance of the evaluation of both the accuracy of online information and the trustworthiness of its source. The findings of this study highlighted the need for further investigation into the skills and knowledge required to evaluate the Internet as a source of information through empirical studies.

References

- Agosto, D. E. (2002). *Library & Information Science Research*, 24, 311–341.
- Ahmadi, M. R., Ismail, H. N., & Abdullah, M. K. K. (2013). The importance of metacognitive reading strategy awareness in reading comprehension. *English Language Teaching*, 6(10), 235–244.
- Britt, M. A., & Gabrys, G. L. (2001). Teaching advanced literacy skills for the World Wide Web. In C. R. Wolfe (Ed.), *Learning and teaching on the World Wide Web*. San Diego: Academic.
- Coiro, J. (2003). Reading comprehension on the internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, 56, 458–464.
- Coiro, J. (2008). *Exploring the relationship between online reading comprehension ability, frequency of Internet use, and adolescents' dispositions toward reading online*. Paper presented at the National Reading Conference, Orlando.
- Coiro, J. (2009). Rethinking online reading assessment in a digital age: How is reading comprehension different and where do we turn now. *Educational Leadership*, 66(6), 59–63.
- Coiro, J. (2011). Predicting reading comprehension on the Internet: Contributions of offline reading skills, online reading skills, and prior knowledge. *Journal of Literacy Research*. Retrieved June 2, 2014, from <http://jlr.sagepub.com/content/early/2011/10/12/1086296X11421979>
- Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, 42, 214–250.
- Coiro, J., Knobel, M., Lankshear, C., & Leu, D. (2008). Central issues in new literacies research. In J. Coiro, M. Knobel, C. Lankshear, & D. Leu (Eds.), *The handbook of research on new literacies*. New York: Lawrence Erlbaum Associates.
- Dwyer, B. (2010). *Scaffolding internet reading: A study of a disadvantaged school community in Ireland*. Unpublished doctoral dissertation, University of Nottingham, UK.
- Flanagin, A. J., & Metzger, M. J. (2007). The role of site features, user attributes, and information verification behaviors on the perceived credibility of web-based information. *New Media & Society*, 9(2), 319–342.
- Greenhow, C., Robelia, B., & Hughes, J. E. (2009). Learning, teaching, and scholarship in a digital age Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 38(4), 246–259.
- Kingsley, T. L. (2011). *Integrating new literacy instruction to support online reading comprehension: An examination of online literacy performance in 5th grade classrooms*. Unpublished doctoral thesis, Ball State University, Muncie. Retrieved from <http://cardinalsolar.bsu.edu/bitstream/123456789/194894/1/Kingsley>
- Kuiper, E., & Volman, M. (2008). The Web as a source of information for students in K-12 education. In J. Coiro, M. Knobel, C. Lankshear, & D. Leu (Eds.), *Handbook of research on new literacies* (pp. 241–266). New York: Lawrence Erlbaum Associates.
- Kymes, A. D. (2007). *Investigation and analysis of online reading strategies*. Unpublished doctoral thesis, Oklahoma State University. Retrieved March 25, 2014, from <http://digital.library.okstate.edu/etd/umi-okstate-2231.pdf>
- Leu, D. J., Jr., Kinzer, C. K., Coiro, J., & Cammack, D. (2004). Toward a theory of new literacies emerging from the Internet and other ICT. In R. B. Ruddell & N. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1568–1611). Newark: International Reading Association.
- Leu, D., Zawilinski, L., Castek, J., Banerjee, M., Housand, Y. L., & O'Neil, M. (2007). What is new about the new literacies of online reading comprehension. In L. S. Rush, J. Eakle, & A. Berger (Eds.), *Secondary school literacy: What research reveals for classroom practice*. Urbana: National Council of Teachers of English.
- Mustafa, H. R., Sain, N., & Abdul Razak, N. Z. (2012). Using Internet for learning vocabulary among second language learners in a suburban school. *Procedia – Social and Behavioral Sciences*, 66(2012), 425–431.

- Slaouti, D. (2002). The World Wide Web for academic purposes: Old study skills for new? *English for Specific Purposes*, 21(2), 105–124.
- Stapleton, P. (2003). Assessing the quality and bias of web-based sources: Implications for academic writing. *Journal of English for Academic Purposes*, 2(3), 229–245.
- Stapleton, P. (2005). Evaluating web-sources: Internet literacy and L2 academic writing. *ELT Journal*, 59(2), 135–143. doi:[10.1093/eltj/cci027volman](https://doi.org/10.1093/eltj/cci027volman).

Chapter 53

Process Oriented Guided Inquiry Learning (POGIL) in Discrete Mathematics

Rosmila Abdul-Kahar, Tay Kim Gaik, Rathiah Hashim,
Muhammad Nurhaffiz Idris, and Normazni Abdullah

Abstract POGIL has been initiated primarily in chemistry education for over the last 15 years ago. In this structure, students built understanding based on their prior knowledge, experiences, skills and attitude which consequently follow a learning cycle of exploration, concept formation and invention. Based on multiple previous studies, it has been examined and proves the effectiveness of POGIL in improving students' study performance. This paper cater about general background of POGIL and activity in project scheduling that has been conducted. In conclusion, educators can increase the strength of student learning in their classes by implementing POGIL.

Keywords Learning cycle • POGIL • Project scheduling • Students learning

53.1 Introduction

Different students identify their own learning styles. According to Abdullatif et al. (2010) the teachers who are of their students' learning styles and design their own teaching materials and teaching techniques can help students develop positive attitudes or otherwise, they can cause negative attitudes. However, how can we adapt only one learning styles for the entire student during the lessons. Although there are characteristics of learning style that are quite stable in an individual across different learning tasks and contexts, there can still be variation in the same learner

R. Abdul-Kahar (✉) • T. Kim Gaik • R. Hashim • M.N. Idris
Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia
e-mail: rosmila@uthm.edu.my; tay@uthm.edu.my

N. Abdullah
Universiti Teknologi Malaysia, 81300 Johor Bahru, Johor, Malaysia

in Smith and Dalton (2005). Generally, learning style can be defined as an individual's habits of receiving and processing knowledge in leaning situations. Keefe (1979) defines learning styles as the "composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment." Thus, learning styles are actually concerned about how learners prefer to learn rather than what they really want to learn. This paper contain a briefly introduction about POGIL in Sect. 53.2 followed by a review on the sample POGIL module which is Project Scheduling. Analysis of the survey from students was discussed in Sect. 53.3. As a closure, we include a conclusion that we achieve from the study.

53.2 Process Oriented Guided Inquiry Learning (POGIL)

As stated before, POGIL stands for Process Oriented Guided Inquiry Learning. Before we explore any further, we will discuss some general background of POGIL. The process of participating students in a project that lead them to produce a product is known as Process Oriented learning. However, the main target is not the product itself but the learning effect throughout the development of product. Other that capable of creating students interest, Process Oriented learning also supply motivation and let students identify the relations of the learning with prior knowledge. This is one type of enhanced learning because it make use of learners understanding to ensure them to create a new design based on their interpretation and explicit prior knowledge.

Guided Inquiry Based Learning is chosen from four other types of learning inquiry which is confirmation, open and structured inquiry. Generally, POGIL is a student-centered strategy where students get to work in a small groups which each of the members has its own roles so that all students can involve and get along during the learning process. Inquiry that is guided by an instructional team to enable students to gain a depth of understanding and a personal perspective through a wide range of sources of information is called Guided Inquiry (Kuhlthau et al. 2007). In addition, Guided Inquiry involve three phase of learning cycle which is exploration, concept invention or formation and application. Refer to Fig. 53.1.

Although, producing a POGIL materials usually consume a lot of time, but nowadays many resources are available that will help an author to develop it without any boundaries. Basically, an author needs to understand POGIL clearly before they starts making the materials. Firstly, an author needs to know the objectives of the design materials which the aim of the study and what did they want students to achieve at the end of the lesson. Hence, depends on the objectives just now, an author can creates a questions that will lead students into achieving their objectives. These questions should include three key question types which is directed, convergent and also divergent question. For directed question type, it can be directly answered by student based on the given information and these types of question usually use to help the students embrace the content of the model. Convergent

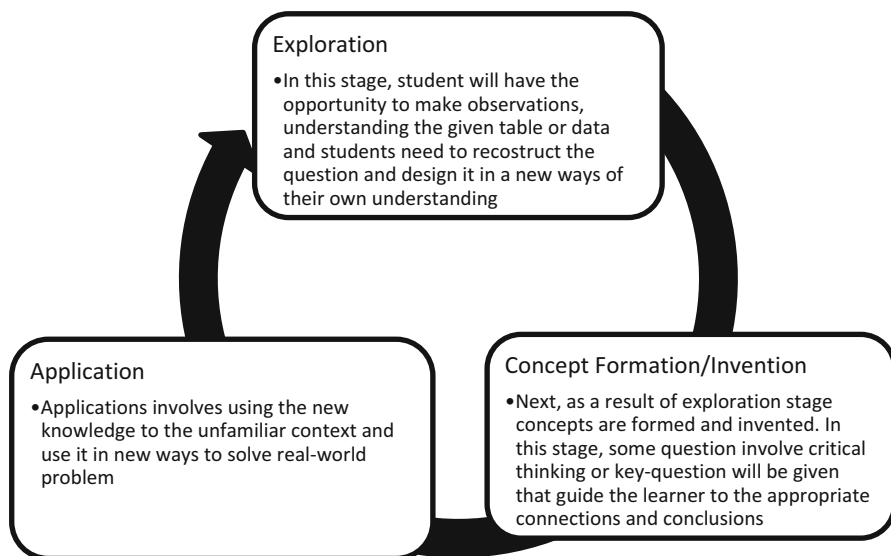


Fig. 53.1 Learning cycle

question helps student to learn and use the model after they have come to an agreement about the topic. Finally, divergent question is a more delicate questions type where it may all be neither correct nor false which is it actually are the other way round to make students understand the content in more complex form than before.

Generally, in a POGIL class the instructor does not lecture (Douglas & Chiu 2013). Students will be divide into smaller group consists of five or less students. The importance of working in small group is to ensure all of the group member could involve with the group task which is a guided inquiry materials. Then, each of them has their own individual roles which they actually demand to learn and perform their individual task at the same time. For example, a leader of a group. They needs to learn and discuss the materials and at the same time required to lead their group to finish the task. This, as a result will also improve their essential skills. In a meantime, instructor which acts as a facilitator will walk around the classroom, guide the students if necessary and ask them question to identify their understanding. POGIL firstly were implemented to a chemistry student's curriculum in 1994 and now it has been extended for Engineering and Science. It is almost already 15 years when the POGIL has start to be use but not to the entire course. Based on the observation and survey for students which learn using POGIL approach, there has been a lot of improvement on their results. This is because some of them enjoying the lesson and can understand the connection of POGIL activities with real life problem. "Very good Effort. I want to know whether we can use POGIL based mathematics to know the variation in Mathematical thinking and learning of different ethnic groups. If yes, can i use your developed lessons for my data collection?" (Mahmood 2012).

In this paper, it describes the implementation of POGIL in Mathematics and focused on Discrete Mathematics. This is because, Discrete Mathematics is a subject which we played around with logic and proving. But, can student's really related Discrete Mathematics subjects in their real life if educator still use traditional ways of teaching and learning. "There is no question about what arithmetic is for or why it is supported. Society cannot proceed without it." (Dudley 2010). In other word, mathematics is all around us including Discrete Mathematics. Besides, National Research Council (2007) also state that "The meaning of 'knowing' has shifted from being able to remember and repeat information to being able to find and use it."

53.2.1 *Sample Activity: Project Scheduling (PS)*

In this section, it will shows how exactly POGIL's activity been done and what will students and instructor do throughout the activity. Other than that, this section also describes the part of the activity which could lift up the motivation of students and also various variations that happen during the activity. The full module for this activity can be found online.

To begin with, the activity start with facilitator or instructor giving some information needed to the students such as background of activity, how the activity will be carry out, forming a group of five and then distributes the guided inquiry activity module to the group leader. Instructor will only be given around 5 min. Teams can be formed in many ways but random choices of group members are more suggested. On the next section, it will discuss and elaborated the activity refers to the module which will be written in Italics. We adapted the work done by Clifton L. Kussmaul (2012) for this activity.

Instruction

Form a group of 5. Assign each of the group member as a Leader, 2 Writers (section A and section B), Timer and Presenter.

As mention before, each of the group member needs to commit their own individual task and also group task. So, the following role will be given to the students:

- Leader: Make sure all the group member involves during the activity and lead the group task so that it must completely done when submit to facilitator;
- Writer: To write the discussed activity in the answer space given;
- Timer: Needs to control the time during the activity;
- Presenter: Ready to answer any question given by the Facilitator;

From all the roles, it can be shown that they needs each other during the activity. Besides, with variety of roles it provides different perspective which in other ways would motivate them to contribute.

Cookie Recipe

Assume that all needed equipment and ingredients are available.

Cream the “wet” ingredients:

- *2 cups butter or margarine (1 pound)*
- *2 cups white sugar*
- *2 tsp. vanilla*
- *2 cups brown sugar*
- *Mix in one by one: 4 eggs*

In a bowl, mix the “dry” ingredients:

- *4 cups flour*
- *2 tsp. baking soda*
- *1 tsp. salt*
- *2 tsp. baking powder*

Add the “dry” ingredients to the “wet” ingredients.

Flavour Ingredient:

Mix in: 5 cups “blended oatmeal”

Add:

- *12-oz. bags semi-sweet chocolate chips (differently-sized chips are good)*
- *12 oz. of milk chocolate, grated*
- *4 cups chopped pecans or walnuts, 12 oz. of coconut (both optional)*

Bake preparation:

- *Chill the cookie dough for 15 minutes.*
- *Roll into golf-ball-sized balls (or bigger), and bake for 11 minutes at 375.*
- *(Remember to preheat the oven in 5 minutes) The cookies will be browned but soft inside.*

Clean up

Above are the list of cookies ingredients and students need to review the list of cookies ingredient before proceed to the next stage which is critical path questions. These are the real life activities that are chosen for this project. Besides, the list of ingredients needs to be act as an introduction to ensure students understand the topic before they can start analyse it.

Critical Path Question

I. Intuitive Estimates (6 min)

- *Estimate as a team how long it would take for 1 cook to make a batch of cookies.*

This question is an intuitive questions type. This is a warm up activities which students could discuss briefly and simply with their teammates. Besides, since it is

work as team concepts, all of the team members ought to give opinions on their estimate time to make a batch of cookies. After giving their opinion, they should discuss who opinion is the more reasonable and accurate and decide only on one answer. Proceed to question II.

II. Steps (10 min)

- *Write each step in the recipe on a separate piece of paper. At least 8 step*
- *Assign each step to one of the following groups – add groups and steps if necessary. Dry Ingredients, Wet Ingredients, Flavor Ingredients, Baking Preparation, Cleanup*

For this question, students need to write each step which is Dry Ingredients, Wet Ingredients, Flavour Ingredients, Baking Preparation and Cleanup in a separate piece assign the steps to the teammates. This requires the role of the group leader to assign the steps. The aim of this question is to guide students in solving the activities in group which each of the group member needs to work on the activities.

III. Times (10 min)

- *Estimate the time to complete each step.*
- *Add all of the step times. Is this how long the recipe would take for 1 cook?*
- *Which steps are difficult to estimate? Why? How could these estimates be improved? Summarize the discussion.*

The first question is to do an estimation time for each of the given step to be completed. Then, gather all the estimate time for each step to identify time taken to complete a batch of cookies. The accumulation of estimated time in each steps may be differ from the first estimation time to make a batch of cookies. From this difference, student's needs to identify which steps are the most difficult steps to be estimated and how this estimation can be improved. From all of the questions, basically students are encouraging to work in group. At first, the tasks were dividing individually, and then students needs to compile the answer and presents the answer by their opinions. The discussion will be running continuously since the question given were questioning about the relevance of their evaluation.

IV. Dependencies (12 min)

- *Assume there is just 1 cook, and organize the steps in order in a row from left to right. Try to minimize the total time the recipe will take.*
- *Looking at groups is useful when there are too many steps to see at one time. Discuss and make a Gantt chart.*
- *How could each step's status be shown on the Gantt chart? How useful would this be to review the status of the entire project?*

Continue from the previous question, now student's needs to organize their cooking steps by minimizing the time taken and design a Gantt chart.

In this question, students were introducing to a systematic approach on preparing cookies. This is because, Mathematics has their own systematic ways to define and analyze any methods. Besides, they were also being familiarized with Gantt chart. Students should also understand the use of Gantt chart in organizing any procedure.

V. **Resources (10 min)**

Assume that 5 cooks are working together to make the recipe. Each cook can do just one step at a time, but different cooks can do different steps at the same time.

- *Organize the steps by in order from left to right, with a row for each cook. Try to minimize the total time the recipe will take.*
- *Copy the new schedule onto a blank worksheet, with a bar for each step and group. This is a resource Gantt chart.*
- *Assume that one food processor is required to blend oatmeal, grate chocolate, and chop nuts. How could you include this in the schedule and Gantt chart*

This question is the convergent type of questions. This type of question was given to students so that they can relate the study although there is a new additional instruction.

VI. **Critical Path Method (10 min)**

- *Which steps cannot be shifted without changing the total time to make the recipe? On the schedule sheet, outline or highlight these critical steps.*
- *Which steps can be shifted without changing the total time to make the recipe? For each steps, use the schedule worksheet to indicate the earliest and latest start time that would not change the total time.*

The final question is basically a divergent question which is a bit tricky question. Students need to identify the steps that can be shifted or cannot be shifted without changing the total time to make the recipe.

53.3 Result and Discussion

In order to examine student's response and progress after the implementation of POGIL, a survey had been conducted at the end of POGIL session. Questions 1, 2 and 3, were to analyze how student's interaction during the activities. There were three types of interaction that ought to be happen which is with itself to the learning, to the instructor and to their fellow learning team.

From Fig. 53.2, almost all of the students agreed that during the activities they can easily interact with each other compare to normal classes where there is only interaction between students and lecturer. This is because, POGIL follow the cycle of exploration, invention and application which believe interacting and communicating with each other throughout the learning will enhances students understanding.

STUDENT'S INTERACTIONS

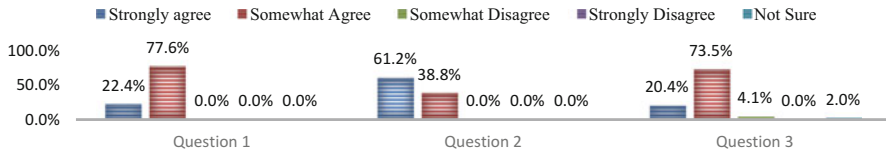


Fig. 53.2 Student’s interactions during the activities

STUDENTS'S RESPONSE

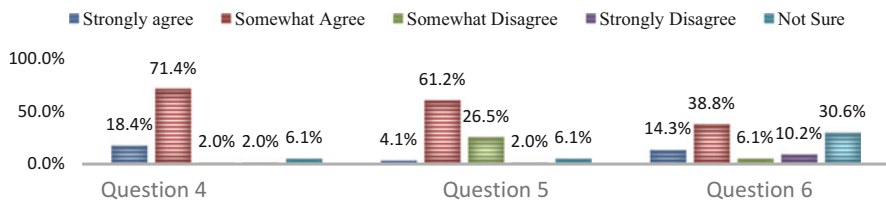


Fig. 53.3 Student’s response during the activities

Student’s response during the activities were concluded in Fig. 53.3. Based on Fig. 53.3, in general almost 50 % of the students agreed that they get an opportunity to ask and clarify their understanding during the activities. One student describe his group experience, “It makes learning discrete mathematics fun and interesting and as a results, we learn and understand better”.

“Therefore, several common and main outcome are observed based on student’s feedback on POGIL;

- (a) Students prefer POGIL approach over traditional approaches
- (b) Students generally had built an interest about the courses and the class environment.”

According to both the result and finalize outcome of the study, it can be verify that the future design endeavors for students should be construct based on students learning style. Therefore, it is appropriate to take POGIL as one of the learning styles that which has more interaction, consider more on visual and active learning.

53.4 Conclusions

POGIL can be the best of learning style for students. This is because POGIL focus on students-centered activity which generally students will conduct the activity themselves and teaches act as a guide to help them if needed. Other than helping students in learning, POGIL also had been proved that could help students improve

or increase their essential skills without they even realized it. In addition, by implementing POGIL in university it could be a very big help to the students after they ended their students' life and continue with their work life because POGIL is also how students applied the studies in real life. They know how the subjects or topic really useful for them in life. Hence, POGIL could give many advantages than disadvantages where educator are really suggested to apply this learning style for their students.

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References

- Abdullatif, I., Raja, M., & Shahrir, J. (2010). Assessment of students' learning styles preferences in the faculty of science. *Procedia-Social and Behavioral Sciences*, 2, 4087–4097.
- Douglas, E. P., & Chiu, C.-C. (2013). Implementation of Process Oriented Guided Inquiry Learning (POGIL) in engineering. *Advances in Engineering Education*, 3(Winter), 1–16.
- Dudley, U. (2010). What is mathematics for? *Notices of the AMS*, 57, 5.
- Keefe, J. W. (1979). *Learning style: An overview. NASSP's student learning styles: Diagnosing and prescribing programs* (pp. 1–17). Reston: National Association of Secondary School Principals.
- Kuhlthau, C. C., Maniotes, L. K., & Caspari, A. K. (2007). *Guided inquiry: Learning in the 21st century*. Santa Barbara: Libraries Unlimited.
- Kussmaul, C. L. (2012). *Process Oriented Guided Inquiry Learning (POGIL) for computer science & software engineering*. San Antonio: American Society for Engineering Education.
- Mahmood, A. (2012). *7th Grade POGIL-Based Mathematics Lessons*. <http://weisenfeldj.wordpress.com/2011/12/03/7th-grade-pogil-inspired-lessons/>
- National Research Council. (2007). *How people learn*. Washington, DC: National Academy Press.
- Smith, P. J., & Dalton, J. (2005). *Getting to grips with learning styles*. Adelaide: National Centre for Vocational Education Research (NCVER).

Chapter 54

A Preliminary Study on Selected Malaysian Millennials: Their Characteristics and Its Implications on Teaching Innovation

Faizah A. Majid, Sharifah Muzlia Syed Mustafa, Ismie Roha Mohd Jais, Wan Nurul Elia Haslee Shahril, Kaarthuyainy Subramaniam, and Muhamad Aiman Abdul Halim

Abstract This paper addresses an emerging issue on the new and latest addition to the cohorts of adults learners studying in higher education institutes; the millennials. There are various terms used to describe this generation such as Generation Y, Nexters, Echo Boomers, Net Generation and Generation Me. Born between the years 1980 and 1994, the millennials are claimed to be innovative and prone to changes. Much research conducted on adult learners studying in higher education institutes have focused on the adult learners' characteristics. This study on the other hand aimed at investigating the characteristics of the millennials studying in a public university in Malaysia and determining how their characteristics could suggest relevant innovation in teaching. The samples for the present study involved 122 students who were all doing the same pre-degree programme in one of the public universities. Their age range is between 18 and 20 years old. A survey method was employed resulting in the administration of 122 questionnaires which were all completed and returned. Data was analyzed using descriptive statistics software. Findings include the confirmation of some millennials' characteristics as reported in the literature. The salient findings include the millennials' strong relationship with their parents, their need to depend on their parents for decision-making and their need for constant feedback. The findings suggest several aspects of teaching innovation deem necessary in order for the educators to stay relevant to the millennials. Practical suggestions on relevant teaching innovation are offered based on these findings. The top management of higher education institutes could also reconsider the curriculum they provide for the millennials based on the new findings.

F.A. Majid (✉) • S.M.S. Mustafa • I.R.M. Jais • W. N. E. H. Shahril • K. Subramaniam
M.A.A. Halim
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: faiza404@salam.uitm.edu.my

Keywords Millennials' characteristics • Higher education • Teaching innovation

54.1 Introduction

The higher education landscape has seen enormous transformation in recent years. Issues on globalization and democracy in education for instance have brought significant changes in higher education services and access. While globalization has led to latest technology in the provision and delivery of education, democracy in education has brought up limitless opportunities to enter higher education. To a developing country like Malaysia, these issues have come with positive strides. Bigger numbers of students are enrolled in higher education institutes in the country. More programmes with greater emphasis on futuristic ones are being offered to cater to the needs of the future industry players. The advancement in educational technology has also driven new teaching strategies which include online learning tools among the educators.

An interesting point to note is the groups of students currently enrolled in the higher education institutes. According to a report on the top issues facing higher education in 2014 (www.forbes.com/sites/.../top-issues-facing-higher-education-in-2014, retrieved on 13 Oct 2014), higher education institutes across the globe face a challenge in addressing issues relating the “new majority in student bodies” (ibid.). As specified in the report, “policies and programs still make assumptions based on the needs of a shrinking minority” (ibid.).

At this juncture, there is a rising need to address factors concerning the adult learners studying in higher education institutes. Studies on generations are vital in the education field as the findings provide information about each generation's particular characteristics, needs and preferences. Information on the characteristics, needs and preferences “help drive decisions about program content and format, features to emphasize...” (Sandeen 2008, p. 12). As suggested by the report by Forbes, demographic profiles such as their characteristics and preferred learning methods may need re-consideration. Acknowledging the fact that current student population comprises a new cohort of learners such as the millennials, this paper proposes an investigation on the millennials' characteristics and their preferred learning methods. This in turn, may suggest necessary innovation in how they could be taught.

The following are the two main research questions that guide the present study.

- (a) What are the characteristics of the selected millennials?
- (b) What teaching innovation could be suggested based on their characteristics?

54.2 Literature Review

54.2.1 Millennials

There are various terms used to describe this generation, such as Generation Y, Nexters, Echo Boomers, Net Generation and Generation Me (Agati 2011; Twenge 2013). Born between the years 1981 and 1996 (Twenge et al. 2012), the millennials are claimed to be innovative and prone to changes (Sandeen 2008; Deal 2007; Agati 2011). Nonetheless, previous studies done by Howe and Strauss (2000), McCrindle (2003), and Twenge (2013) found several distinct traits present specifically among the millennials which could be used as the basis for this research.

Millennials are said to be more attached to technology in comparison to previous generations (Nicholas 2008; Klein and Liff-Grief 2009; Jones and Shao 2011). Nicholas (2008) further claims that the most frequently used electronic source of information is Google. Besides their strong use of technology, the millennials are also said to have utmost priority on family with special regards to the relationship with their parents. Price (2009) confirms this notion as claiming that the millennials grew up closely with their parents and that they are ready to accept their parents' sense of purpose. Additionally, the millennials grew up being provided for by their parents more than the other generations. McCrindle (2003) claims that the millennials are the most entertained and materially endowed generation.

The millennials are also said to be community-oriented (McCrindle 2003; Klein and Liff-Grief 2009; Jones and Shao 2011). Their core values are based on their civic duty and intention to bring changes to the world. A research done by McCrindle (2003) discovered that in making decisions, the millennials prefer to base their decisions on the experiences of their peers than on themselves. McCrindle (ibid.) further claims that the millennials are team-oriented and sociable. However, there are also contradicting opinions regarding this characteristic of the millennials. Based on their research, Twenge et al. (2012) found that the millennials are more inclined towards extrinsic values than intrinsic ones. Additionally, Twenge (2013) claims that the millennials in her research reported higher narcissism among them. These two findings contradict with earlier findings which claim that the millennials are sociable and team-oriented.

54.2.2 Millennials and Learning

In the learning context, the millennials live in the world of technology. Klein and Liff-Grief (2009) stated that the millennials are immersed in the world of technology that it is part of their life and learning process. In addition, according to Price (2009), the millennials expect their lecturers to be as techno-savvy as they are.

Twenge (2013) discovered that the millennials in her research did not read textbooks. Instead, they preferred interactive learning through demonstrations,

discussions and hands-on activities. Klein and Liff-Grieff (2009) further commented that the millennials in their research looked for rational and reason for every action their educators asked of them. Twenge (2013) related this with the fact that the millennials require purpose and meaning of the activities explained to them.

In a nation-wide survey involving 1171 college students, it was discovered that 97 % of the millennials owned cell phones and over two-thirds had sent text-messages. According to McCasland (2005), instant messaging was the millennials' top choice of communication. He further stated that the millennials download podcasts and music, take photos with their phones besides text messaging one another in their created messaging language. In this instance, the millennials are claimed to be experiential, engaging and interactive (Skiba 2008). Alch (2000) commented that the millennials are creative and investigate or conduct their research using the electronic media.

Technology enables students to accomplish more than they could without the use of technology. Technology allows students opportunities to access information and resources to create products far beyond their perceived capabilities. Research identifies the benefits of technology integration as the technical aspects to enhance the quality of work, promote access to resources, positively impact student learning, and promote student metacognitive skills (Heafner and McCoy 2001; Scheidet 2003). It was observed in a study among the first year students in a private university in Chiba, Japan following the incorporation of the Facebook activity, many of the more introverted students became more motivated in class and were actually talking more with their classmates. It was also noticed that students began to express more opinions and gave extended reasoning in not only their face-to-face interactions but also in their written classwork (Promnitz-Hayashi 2011).

Nicholas (2008) in her study discovered that the millennials relied heavily on technology particularly searching online. Her respondents claimed to frequently use Google (97 %) and Wikipedia (57 %) for assignments. The respondents also favoured multi-media in classes. Additionally, there was an indication that the millennials in her study valued group work, problem solving and case analysis. The millennials also search for relevant information from interactive web pages more than the printed materials. The millennials are also more communicative virtually.

Frاند (2000) stated that the millennials are accustomed to multi-tasking such as watching TV, talking on the phone, doing homework, eating and interacting with their parents all at the same time. Hence, in relating the millennials and learning, Murray (1997) claims that the routine multi-tasking may have shortened their attention span. This in turn, could lead to a lack of critical thinking skills and introspection among the millennials.

54.2.3 Studies on Malaysian Millennials

Though there have been some research done on the millennials across the globe, not as many research have been done on Malaysian millennials especially one that looks into the characteristics of the millennials and their learning methods. Some of

the relevant research includes the investigation of cultural values and career goals of the Malaysian millennials (Maimunah and Hoo 2014), employer rewards and Malaysian millennials (Maznah et al. 2014); millennials' work values as academicians (Raman et al. 2011) and factors influencing generation Y's behaviour at work place (Aminul et al. 2011).

Findings from the past studies in Malaysia have generally reported on the millennials and their workplace. It is interesting to note that the findings confirm that the millennials are web technology savvy and the use of web technologies is a common part of their daily routine.

54.3 Methodology

A quantitative research design was adopted in the present study which is an early stage of a bigger research project. In investigating the characteristics of a selected group of millennials in one of the country's public universities, a set of questionnaire was self-developed and administered. The development of the questionnaire was based on existing literature review and past research findings. Content validation involving four content experts and a pilot test were conducted to confirm the survey form's validity and reliability. Comments from the content experts were considered in the revision of several items in the survey form. The overall Cronbach alpha value from the pilot test was determined at .937, suggesting a strong reliability which enables the researchers to proceed with the data analysis.

The survey form consisted of four parts; Part A: demographic, Part B: millennials characteristics (seven constructs taken from Howe and Strauss 2003) and Part C: Learning process (four constructs). A total of 122 respondents took part in the present study. They were required to respond on a four point Likert scale in Part B and C, with 1 being 'not true of me' and 4 being 'true of me'. For the purpose of this paper, only findings from Part B will be analyzed and discussed. There are 7 construct and 76 items altogether in Part B. The components of Part B are as follows;

The population comprises the millennials studying in social sciences programmes in a faculty in one of Malaysia's public universities. The samples for the present study involved 122 students who were all doing the same pre-degree programme. Their age range is between 18 and 20 years old. There were 27 male and 95 female respondents who participated in the study.

54.4 Findings

The discussions on findings are guided by the two research questions. In order to answer the first research question, data analysis from Part B of the survey form will be elaborated.

In determining the characteristics of the millennials in the present study, seven characteristics identified by Howe and Strauss (2003) are referred. The characteristics are; feeling special, sheltered, confident, team-oriented, achieving, pressured and conventional (Table 54.2).

There are ten items under the characteristic of 'feeling special' which were answered by all the respondents (n=122) in the present study. As shown in Table 54.1, the mean scores range from 2.50 to 3.43. In describing how the selected millennials in the present study felt special, it is noted that claimed that they had to fulfill their parents' expectations (mean=3.54) besides wanting privacy (mean=3.43) and expecting positive feedback (mean=3.27). Additionally, they seemed not to crave for attention (m=2.50) nor thought that they had been treated special (m=2.55). The fact that the respondents felt connected to their parents is supported by Noveck and Tompson (2007) who claim that the millennials who participated in their poll stated that spending time with their family was the top answer.

The mean scores for the eight items under the characteristic of 'sheltered' range from 2.44 to 3.51 as indicated in Table 54.3. In describing themselves as being sheltered, the respondents claimed that they were highly protected when they were a child (mean=3.51) and that their parents protected them from unpleasant experiences (mean=3.48). This is followed by the claim that they grew up in a time of increasing safety measure (mean=3.02). These findings concur with past research findings (Strauss and Howe 2000; Wilson and Gerber 2008). However, despite all

Table 54.1 Components of Part B in the student questionnaire

Construct and sample items	No. of item	Cronbach alpha value obtained from pilot test
1. Feeling special	10	.722
2. Sheltered	8	.756
3. Confident	11	.833
4. Team-oriented	10	.589
5. Achieving	11	.754
6. Pressured	16	.761
7. Conventional	10	.788

Table 54.2 Feeling special

Item	N	Mean	Std dev.
I crave attention	122	2.50	1.009
I have always been treated special	122	2.55	.763
I have to fulfill my parents' expectation	122	3.54	.742
I want privacy	122	3.43	.717
I expect positive feedback	122	3.27	.707

Table 54.3 Sheltered

Item	N	Mean	Std. dev.
I expect the faculty and staff to resolve my conflicts	122	2.44	.980
I grew up in a time of increasing safety measures	122	3.02	.818
When I was a child, I was highly protected	122	3.51	.752
My parents protect me from unpleasant experiences	122	3.48	.695

Table 54.4 Confident

Item	N	Mean	Std dev.
I am assertive	122	2.59	1.030
I think highly of myself	122	2.61	.729
I am confident of the future	122	2.88	.875
I feel connected to my parents	122	3.42	.814
I expect the university to help me achieve greater heights	122	3.31	.729

these when they were a child, the millennials in the present study did not expect the faculty and staff to resolve their conflicts (mean=2.44) (Table 54.4).

Under the characteristic of ‘confident’, the respondents answered 11 items and the mean scores range from 2.59 to 3.42. When it relates to their confidence, it is interesting to note that the respondents indicated that they felt connected to their parents (mean=3.42). This finding concurs with what they claimed earlier on being sheltered. Additionally, although the respondents did not expect the faculty and staff to resolve their conflicts, the millennials in the present study expected the university to help them achieve greater heights (mean=3.3). The respondents also claimed that they are not assertive (mean=2.59) nor thought highly of themselves (mean=2.61) and were confident of their future (mean=2.88). It could be concluded that although the literature suggests that the millennials are motivated, goal-oriented and confident in themselves and the future (Howe and Strauss 2003) and Wilson and Gerber 2008), the millennials in the present study seem to suggest a different degree of confidence. There may still be a certain degree of dependency on their parents and the university when it comes to preparing for their future achievements (Table 54.5).

There are ten items under the characteristic of ‘team-oriented’ and the mean scores range from 1.74 to 3.63. Interestingly, the findings on team-orientedness have indicated similar findings from past research. The respondents disagreed that they excluded other generations (mean=1.74). In fact, they dislike selfishness (mean=3.63) and wanted to be seen as part of a group (mean=3.39). Twenge (2006), Strauss and Howe (2000), and Wilson and Gerber (2008) reported similar findings about the millennials and team-orientedness. According to Wilson and Gerber (2008), “...the millennials have long worked in task groups and are skilled in collaborative effort” (pp. 31) (Table 54.6).

Table 54.5 Team-oriented

Item	N	Mean	Std dev.
I exclude other generations	122	1.74	.887
In order to belong to my group, I am willing to change my identity	122	2.12	1.030
I dislike selfishness	122	3.63	.624
I want to be seen as part of the group	122	3.39	.714

Table 54.6 Achieving

Item	N	Mean	Std. dev.
I do not like studying humanities and arts	122	1.68	.855
I prefer studying maths and science	122	2.00	1.029
Academic grades are important to me	122	3.58	.614
I focus on getting good academic grades	122	3.38	.696

The respondents answered 11 items under the characteristic of ‘achieving’ and the mean scores range from 1.68 to 3.58. As confirmed in past research (Howe and Strauss 2003; Wilson and Gerber 2008), the respondents in the present study saw great importance in academic achievements (mean=3.58) and they focused on getting good academic grades (mean=3.38) (Table 54.7).

All the respondents answered 16 items under the characteristic of ‘pressured’ and the mean scores range from 1.60 to 3.34. The fact that the respondents claimed that they were reminded to take advantage of opportunities (mean=3.34) and were always required to excel (mean=3.05) concur with past findings (Wilson and Gerber 2008; Howe and Strauss 2003). However, unlike past research findings the millennials in the present study did not feel as pressured since they disagreed that they did not have time for spontaneous play (mean=1.60) nor were they used to structured and tight schedule (mean=1.93 and 1.97 respectively) (Table 54.8).

Finally, the respondent also responded to ten items under the characteristic of ‘conventional’. The mean scores range from 2.07 to 3.56. The findings from the present study are similar with those from past research. As concurred by Howe and Strauss (2003), Twenge (2006), and Wilson and Gerber (2008), the millennials value their parents’ opinions (mean=3.61). They are also obedient and follow common social rules and agree with some traditional values (mean=3.56 and 3.42 respectively). As Howe and Strauss (2003) put it, the millennials fear being non-conformist.

Table 54.7 Pressured

Item	N	mean	Std. dev.
I do not have time for spontaneous play	122	1.60	.815
I used to have every hour of my day filled with structured activity	122	1.93	.903
As a child, I had a tight schedule	122	1.97	.887
I am reminded to take advantage of opportunities	122	3.34	.818
I am always required to excel	122	3.05	.899

Table 54.8 Conventional

Item	N	Mean	Std dev.
My choices of clothing, music, and cultural markings will be similar with my peers	122	2.07	.989
I do not question the authority	122	2.49	.893
I value my parents' opinions	122	3.61	.609
I follow the common social rules	122	3.56	.656
I agree with traditional values	122	3.42	.666

54.5 Implications on Teaching Innovation

To this end, it is worthy to note that the present study has confirmed some of the findings from past research. Nonetheless, there are also some findings which contradict the past research findings. Basically, in determining the characteristics of the selected millennials in the present study, it was discovered that they;

- (a) felt special as they were connected to their parents and expected privacy and positive feedback
- (b) knew they were sheltered as they were protected by their parents from harm and unpleasant experiences.
- (c) were not highly confident as they still depended on their parents and the university for important decisions regarding their future and academic activities.
- (d) were team-oriented and value group work.
- (e) valued extrinsic rewards such as academic achievements and getting good grades.
- (f) did not feel pressured despite the fact that they needed to take every opportunities and excel.
- (g) were conformists as they value their parents' opinions and common social rules.

The second research question which is on the relevant teaching innovation could be answered by considering the implications the characteristics of the selected millennials could have on teaching. The data which reveal the obvious characteristics

of the respondents is relevant in answering the second research question. The seven listed characteristics as listed above provides the data that led to the identifying of relevant teaching innovation. However, it is important to note that the samples in the present study comprised between 18 and 20 years old young adult learners who were taking up their pre-degree programme. Hence, some identified characteristics could be due to the fact that they were still literally new in higher education. Besides the identified characteristics, answers to the second research question were also guided by relevant literature review on teaching best practices.

Firstly, one of the obvious teaching innovations that any educator could consider in teaching the millennials is to put their parents and the values of families in the perspective of their teaching content and classroom activities. Assignments such as projects and case studies for example could include the need to relate to family values. It could also be suggested that the parents are involved in monitoring the progress of the millennials' assignments. Positive feedback from the parents during the completion of the assignments could be an alternative in making the millennials more committed to finishing and giving their best in the assignments.

The other teaching innovation could include the type of classroom activities and assessment. It is noted that the millennials value group work and collaborative efforts. The present study has discovered the reasons behind this preference that is the millennials prefer to be seen as part of a group and that peer support is important to them. Therefore, an innovation that could be considered is the need to encourage more collaborative efforts through group work and peer assessment during the completion of the assignments or activities. Educators could design peer assessment form which highlights.

At this juncture, perhaps another aspect of teaching innovation necessary is the application of information and communication technology to encourage collaborative efforts among the millennials. Literature has confirmed that the millennials are group-work driven and the findings of the present study confirm it. In an effort to minimize challenges in producing collaborative work, educators need to shift towards the inclusion of online and smart learning tools and gadget respectively. Smart gadgets such as their hand phones and tablet need to be allowed in the classroom as the millennials mostly search for information from search engines such as Google and Wikipedia. The advent of technological applications and sites changes the landscape of the future education (Matney 2006).

Nonetheless, it is not only their characteristics that make it a challenge, but the dynamics the characteristics and experiences of the previous generations create when interacting with them. One of the main causes is the vertiginous pace of technological development and change that creates a divide embodied in the millennial generation. This is further supported by Prensky (2001) who claims that our students' brains are wired differently from ours as a result of how they grew up. Their thinking patterns have changed over intense and consistent exposure to the technological stimulus. In order to support this new learning demands, Dede (2005) suggests institutions could use these emerging technology to deliver instruction matched to neomillennials learning styles.

The millennials also search for relevant information from interactive web pages more than the printed materials. The millennials are also more communicative virtually. It can be said that technology and the internet possibly played a role and these types of activities do show promise as they appear to give students choices and opportunities to have control over their own learning. These kinds of opportunities and environments may create conditions for facilitating the development of learner autonomy.

Hence, based on the findings that the millennials work collaboratively and the literature further confirm that they are techno-savvy, internet communication platforms such as facebook, group wiki, and blogs need to be incorporated as part of classroom activities or assignments. The varieties of instant message applications offered via technology such as whatsapp, and telegram need not to be seen as a distraction to the millennials' learning. Yet, these applications could complement group work tasks and encourage active interaction among the group members. In the new classroom landscape, the role of the educator could shift from being the traditional 'mobile-police' to coaching the students on how best can they use the mobile applications to their learning advantage.

Since the millennials appreciate extrinsic recognition, one other teaching innovation could include the mechanism of continuous positive appraisal of their work. Educators need to realize that constant positive feedback is a tool to motivate the millennials. Additionally, the millennials require constant reminder of how well they are progressing. Diagnostic chart of each millennial which records their performance development could be a relevant and practical documentation. Since the record is made available, the evidence of their performance is indirectly also made available. The presence of such documentation serves as their constant reminder and positive feedback throughout their studies.

54.6 Conclusion

In conclusion, the present study has brought to light relevant information regarding the millennials' characteristics. The seven characteristics presented by Howe and Strauss (2003) have become the reference to many researchers including the present study. The findings have provided data which supports some of the characteristics identified by Howe and Strauss (2003). Additionally, the findings have also suggested different degrees of characteristics among the millennials in the present study compared to those in past research namely 'confident' and 'pressured'. The fact that the samples of the present study comprised young adult learners who were between 18 and 20 years old and that they were beginning life as a college student might have influenced the findings.

Several suggestions for teaching innovation are made based on the identified characteristics. Relevant literature review was also referred in confirming the innovation suggested. The innovation suggested include the use of materials, types of assessment, monitoring and appraisal procedures as well as the inclusion of smart

gadgets in the classrooms. The teaching innovations are suggested with the idea that they could be adopted by any educators regardless of subject or level of programmes taught. This in turn may suggest that the top management of the university may need to re-consider how education is provided and delivered to the new majority of student population in the higher education institutes. Issues on teaching materials, types of assessment and its mechanism, parents' participation and the use of technology and smart gadgets in the classroom need to be incorporated in a newly designed curriculum.

References

- Agati, H. (2011). *The millennial generation: Howe and Strauss disputed*. PhD thesis. The College of William and Mary. 2012.
- Alch, M. L. (2000). Get ready for a new type of worker in the workplace: The net generation. *SuperVision*, 61(4), 3–7.
- Aminul, I., The, W. C., Dayang, H., & Hazry, D. (2011). A study on Generation Y behaviours at workplace in Penang. *Australian Journal of Basic and Applied Sciences*, 5(1), 1802–1812.
- Dede, C. (2005). Planning for neomillennial learning styles. *Educause Quarterly*, 28(1), 7–12.
- Deal, J. J. (2007). *Retiring the generation gap: How employees young and old can find common ground*. San Francisco: Josey-Bass.
- Frand, J. (2000). The information age-mindset: Changes in students and implications for higher education. *Educause Review*, 35, 14–24.
- Heafner, T. L., & McCoy, L. P. (2001). Technology and the academic and social culture of a university campus. In J. Price, D. Willis, N. Davis, & J. Willis (Eds.), *Proceedings of the society for information technology in teacher education 01*. Charlottesville: Association for the Advancement of Computing in Education.
- Howe, N., & Strauss, W. (2000). *Millennials rising: The next great generation*. New York: Vintage Books.
- Howe, N., & Strauss, W. (2003). *Millennials go to college*. Great Falls: LifeCourse Associates.
- Jones, C., & Shao, B. (2011). *The net generation and digital natives: Implications for higher education*. Milton Keynes: Open University/Higher Education Academy.
- Klein, L., & Liff-Grieff, S. (2009). From generation to generation: Changing behavioural perceptions and expectations in Jewish nonprofits. *Journal of Jewish Communal Service*, 83, 325–333.
- Maimunah, I., & Hoo, S. L. (2014). Cultural values and career goals of the millennial generation: An integrated conceptual framework. *The Journal of International Management Studies*, 9(1), 38–49.
- Matney, M. M. (2006). What is emerging in research about millennials? *What's on Our Student's Minds*, 2(3), 1–4.
- Maznah, W. O., Khaliza, K., Sarah, S. A., Marhana, M. A., Mohd Noor, M. A., & Tai, Y. S. (2014). Employer rewards and Malaysian millennials. In *Proceedings of 4th international conference on management* (pp. 91–95). Karachi: Institute of Business Administration.
- McCasland, M. (2005). Mobile marketing to millennials. *Young Consumers: Insight and Ideas for Responsible Marketers*, 6(3), 8–13.
- McCrinkle, M. (2003). Understanding Generation Y. *Principal Matters*, 55, 28–31.
- Murray, N. D. (1997). Welcome to the future: The millennial generation. *NACE Journal*, 57(3), 36–42.
- Nicholas, A. (2008). Preferred learning method of the millennial generation: Newport. Salve Regina University, Faculty and Staff – Article & Papers.

- Noveck, J., & Tompson, T. (2007). *Poll: Family ties key to youth happiness*. Retrieved August 5, 2008, from http://www.boston.com/news/education/k_12/articles/2007/08/20/poll_family_ties_key_to_youth_happiness/
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9 (5).
- Price, C. (2009). Why don't my students think I'm groovy?: The new "R"s for engaging millennial learners. *Essays from E-xcellence in Teaching*, 9, 29–34.
- Promnitz-Hayashi, L. (2011). A learning success story using Facebook. *Studies in Self-Access Learning Journal*, 2(4), 309–316.
- Raman, G., Ramendran, C., Beleya, P., Nadeson, S., & Arokiasamy, L. (2011). Generation Y in institution of higher learning. *International Journal of Economics and Business Modeling*, 2(2), 142–148.
- Sandeen, C. (2008). Boomers, Xers and millennials: Who are they and what do they really want from continuing higher education? *Continuing Higher Education Review*, 72, 11–31.
- Scheidet, R. A. (2003). Improving student achievement by infusing a web-based curriculum into global history. *Journal of Research on Technology in Education*, 36(1), 77–94.
- Skiba, D. J. (2008). Nursing education 2.0: Games as pedagogical platforms. *Nursing Education Perspectives*, 29(3), 174–175.
- Strauss, W., & Howe, N. (2000). *Millennials rising: The next great generation*. New York: Knopf Doubleday Publishing Group.
- Twenge, J. (2006). Generation me. Retrieved from <http://www.generationme.org/>
- Twenge, J. M. (2013). Teaching generation me. *Teaching of Psychology*, 40, 66–69.
- Twenge, J., Campbell, K., & Freeman, E. (2012). Generational differences in young adults' life goals, concern for others and civic orientation, 1966–2009. *Journal of Personality and Social Psychology*, 102, 1045–1062.
- Wilson, M., & Gerber, L. (2008). How generational theory can improve teaching: Strategies for working with the "Millennials". *Currents in Teaching and Learning*, 1, 29–44.

Chapter 55

A Romanised Mandarin Web-Based Instruction: Its Economic Potentials and Acceptance Levels of Non-native Mandarin Learners

Lim Soo Giap

Abstract The Guru Hanyu Pinyin web-based instruction (Romanised Mandarin Web-based) is specially designed to tackle the specific needs of UiTM students. The main objective of this paper is to examine the acceptance levels of UiTM students towards the design of the instruction. It deals with suitability of content, structure of the content, the appropriateness of the language used and user-friendliness of icons. At the same time, this paper describes the economic potentials of romanised Mandarin web-based instruction in South-East Asia countries especially for non-native Mandarin learners. This research focuses on first year elementary level Mandarin students at UiTM Penang campus. A total of 28 students have been selected from two Mandarin classes to attend a 4-h self-learning session. After the lesson, a questionnaire on the design of the instruction is given to each student. The finding shows that majority of the students feel that the content of the web-based Hanyu Pinyin instruction suits their level of proficiency and well structured, most of the students also feel that the language used is appropriate and easy to understand, and they also agree that the icons of Guru Hanyu Pinyin web-based instruction is user-friendly. Learners have no difficulty in using this Guru Hanyu Pinyin web-based instruction.

Keywords Economic potentials • Mandarin • Non-native learners • User friendliness • Web-based instruction

L. Soo Giap (✉)
Academy of Language Studies, Universiti Teknologi MARA (UiTM),
Campus Pulau Pinang, Permatang Pauh, 13500 Pulau Pinang, Malaysia
e-mail: limsoogiap266@ppinang.uitm.edu.my

55.1 Introduction

The Internet and the World Wide Web (WWW) continue to exert tremendous influence on our everyday lives. The use of the WWW as an instructional tool is gaining momentum as more teachers, instructors, and trainers incorporate it into their repertoire. This trend will certainly bring a change in teaching. The web-based instruction (WBI) is the instructional materials that are used in the learning system that involves the network operation center (NOC), the WWW resources, the learners, instructors and the regularly conducted lectures of fulltime teaching staff. Web-based instruction, which is also called as Web-based training, is defined as an “individualized instruction that is delivered over public or private computer networks and displayed via a Web browser”. WBI is not a downloaded Computer Based Training but an on-demand training stored in a server and accessed across a network. Web-based training can be updated very rapidly and its accessibility as a training tool is fully controlled by the training provider.

55.1.1 Problem Statement

Hanyu Pinyin (Romanised Mandarin) is used in the teaching and learning of Mandarin as a third language in UiTM (University of Technology of MARA) after Malay and English language. Generally, the first 2–4 h of lecture are allocated to the teaching of the sound system in Hanyu Pinyin. The time allocated is definitely insufficient for learners, many of whom are exposed to Mandarin for the first time, to satisfactorily comprehend the intricacies of its sound system. In order to achieve better learning efficiency, there is a strong need for lecturer to spend extra hours with the learners on additional practice and consultations. Hence, it is necessary to devise some self-learning materials for learners to enable them to control and monitor their learning process in the absence of facilitator. In order to create an environment conducive for self-learning Hanyu Pinyin, a web-based instruction is suggested to be incorporated into the curriculum.

55.1.2 The Advantages of Using WBI

A web-based instruction can be delivered on demand to any computer connected to the Internet anywhere in the world. This advantage cannot be matched by any other methodology known today. ‘A picture tells a thousand words’, thus it is assumed that the web-based instruction that includes multimedia elements will increase the flexibility for learners, thus benefiting them. In short, the players in education will gain the benefits of web-based instruction as listed below.

The Education Institution

- (a) Reduces and/or eliminates overhead expenses such as instructional rooms, training computer and equipment.
- (b) Flexibility in updating and adding course content. Instruction is installed on a few file server.

The Facilitator

- (a) Reduces time to guide the learners. Thus the facilitator can utilize the time to enhance the course contents.
- (b) Makes updating or introducing new syllabus easier and quicker.
- (c) Could be used as teaching aids in class. Each learner can get certain amount of individual feedback from the instruction rather than depending fully on the facilitator, hence it lightens the teaching burden of facilitators especially when the number of trainees is big.

The Learners

- (a) WBI provides quick and convenient navigation of learning aids for learners.
- (b) Self assessment learning tools. Learners can get individualized practice and feedback at own pace. It can also be used to reinforce learning after class.
- (c) Flexibility (any time, place or level). The learning materials are available 24 h a day, 7 days a week. Information can be easily accessed whenever needed. It also allows learners to start at their appropriate level.

55.1.3 Economic Potentials

Due to the emergence of China as a world's economy super power, learning Mandarin becomes more crucial and important for effective communication as well as in developing a better competitive edge in the international market. Therefore, the economic returns of teaching Mandarin for non-native speakers become very attractive. The total population of Southeast Asia in 2010 was 593 million (Gavin 2013). If the targeted population is only 10 %, it will be 59.3 million. The return of investment will be very attractive.

The Mandarin web-based instruction (WBI) is specially designed by the writers for Malay-speaking learners. Presently, most of the Mandarin web-based instructions in the market focus on Mandarin or English-speaking learners. In a survey, Xu Zhijuan (2005), has selected 12 popular Hanyu Pinyin WBIs and ranked them according to ten criteria. The result shows that the Hanyu Pinyin WBI of the Chinese University of Hong Kong is far more superior to the others.... However, the instruction language is in Mandarin, and therefore not suitable for those who are not proficient in the language. In short, teaching Malay-speaking learners targeted on their common mistake in learning Mandarin is a niche market. Furthermore, lack of Mandarin learning materials for non-native speakers makes this project more attractive and interesting.

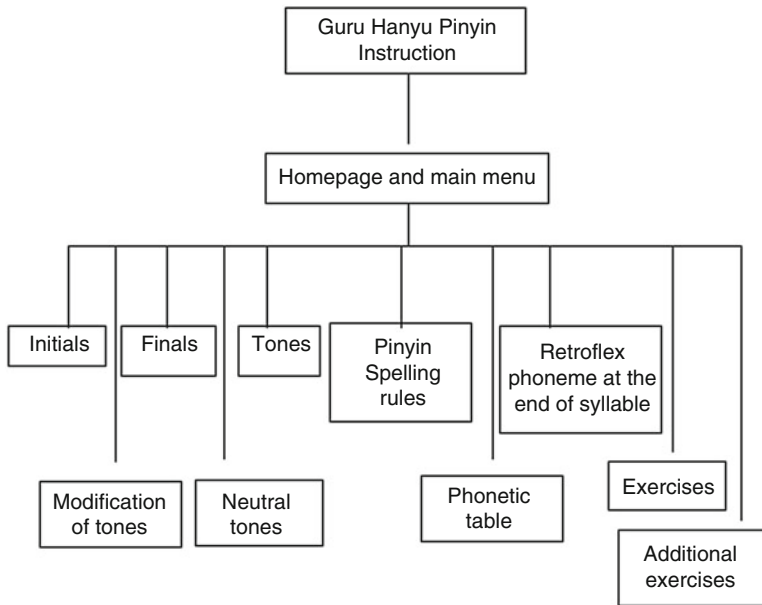


Fig. 55.1 Main features of Guru Hanyu Pinyin instruction

55.1.3.1 The Guru Hanyu Pinyin Instruction Design

The Guru Hanyu Pinyin web-based instruction (WBI) is specially designed by the writers to overcome the common mistakes in learning Mandarin pronunciation based on the specific needs of Malay learners (Lim et al. 2010).

The Guru Hanyu Pinyin instruction's design is based on the modular concept where information is chunked into several modules for instructional purposes. By chunking information, it is easier for instruction designer to develop the course content. For learners, it is easier for them to absorb and remember the information. The Hanyu Pinyin instruction is made up of small, functional and independent unit. It contains ten main modules that are structured in a way that progresses from lower to higher level skills incorporating initials (Fonem Awal), finals (Fonem Akhir), tones (Nada), Pinyin spelling rules (Peraturan Ejaan Pinyin), syllable that ended with Retroflex phoneme (Fonem Gelungan pada akhir suku kata), modification of tones (modifikasi nada), neutral tones (Nada neutral), Chinese phonetics table (Jadual fonetik bahasa Cina), Exercises (Latihan) and additional exercises (latihan tambahan). These modules are further divided into smaller units. Figure 55.1 depicts the main features of Hanyu Pinyin instruction.

55.1.4 Objective of the Study

The main objective of this research is to examine the acceptance levels of UiTM students towards the design of Guru Hanyu Pinyin web-based instruction (Romanised Mandarin Web-based). This paper report is the second part of the whole research

and it deals with the suitability of content of the instruction, the structure of the content of the Instruction, the appropriateness of the language used in the instruction and user friendliness of icon only.

55.1.5 Research Questions

- (a) How was the acceptance level of UiTM students towards the suitability of content of the web-based Hanyu Pinyin instruction?
- (b) How was the acceptance level of UiTM students towards the structure of the content of the web-based Hanyu Pinyin instruction?
- (c) How was the acceptance levels of UiTM students towards the appropriateness of the language used in the web-based Hanyu Pinyin instruction?
- (d) How was the acceptance level of UiTM students towards user friendliness of icon of the web-based Hanyu Pinyin instruction?

55.2 Literature Review

The key elements used in this paper are UiTM, Hanyu Pinyin, WBI (Web-based instruction), Mandarin facilitator, non native Mandarin learners, Chinese language learning on the Internet, the Hanyu Pinyin WBI on the Internet and user friendly WBI.

55.2.1 UiTM

UiTM is University of Technology of MARA. The university is selected for this research in view of its large population of Bumiputra students from various disciplines. In order to equip their students with language skills, UiTM also offer several foreign language courses including Mandarin to the students.

55.2.2 Hanyu Pinyin

Hanyu Pinyin is a form of Romanized Mandarin. It was devised by the government of the Peoples' Republic of China in 1958 to help non-native speakers to study Chinese. It is the most widely used Mandarin transliteration method which has been adopted in many countries including Singapore. Most contemporary dictionaries use Pinyin to spell out Chinese characters, and the vast majority of Chinese textbooks published overseas use Pinyin (Zhang 2006). By mastering Pinyin, learners can easily read Chinese books printed in characters which are at the same time transliterated into Pinyin.

55.2.3 *Web-Based Instruction (WBI)*

Khan (1997) defines Web-Based Instruction (WBI) as “...a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported.” According to Relan and Gillami (1997) WBI is “...the application of a repertoire of cognitively oriented instructional strategies within a constructivist and collaborative learning environment, utilizing the attributes and resources of the World Wide Web.” Web-Based Instruction, also called Web-Based Training, is defined by Clark (1996) as an “Individualized instruction delivered over public or private computer networks and displayed by a Web browser. WBT is not downloaded CBT, but rather on-demand training stored in a server and accessed across a network. Web-based training can be updated very rapidly, and its accessibility as a training tool is controlled by the training provider.” Clearly, as the name suggests, one common feature for all forms of WBI is that the instructional materials are delivered over the Internet.

55.2.4 *Non-Native Mandarin Learner*

Learner is someone who learns to speak Mandarin. Non native refers to the people whose mother tongue is not Mandarin. Non-native Mandarin learners are learners that speak Malay or Indonesia language as mother tongue and learn to speak Mandarin.

55.2.5 *UiTM Mandarin Lecturer/Facilitator*

Lecturer/Facilitator is someone who helps a group of people discuss things with each other or do something effectively. In UiTM, the Mandarin lecturer plays the role as a facilitator who helps the non native learners to study Mandarin effectively.

55.2.6 *User Friendly WBI*

The user refers to the UiTM students that use the Hanyu Pinyin WBI in learning Mandarin pronunciations. The product refers to the Hanyu Pinyin WBI constructed by the facilitator that entitled Hanyu Pinyin Guru. Friendly means not difficult for particular people to use. Therefore, user friendly WBI refers to a WBI that is easier to use and accepted by the UiTM students.

55.2.7 Chinese Language Learning on the Internet

According to Bourgerie (2003), the Internet sources for learning Chinese can be as simple as supplements for established texts or comprehensive courses such as Beijing Language and Culture University's on-line degree program for Chinese. Other on-line sources consist of independent modules to address a particular aspect of learning such as pronunciation and Romanization Hanyu Pinyin WBI on the Internet. Among the well-designed and established Hanyu Pinyin WBI according to Shao (2005), are the Chinese Pronunciation Guide of Harvard University and the Pinyin Pronunciation for Mandarin of Oxford. The contents of these two websites are not designed and arranged in accordance with any existing teaching materials and as a result, they can be modified easily. Similarly, they can be accessed by not only students from the two universities but the public as well. Since the two sites are not based on existing teaching materials, they focus mostly on vowels, consonants, word-level and phrase-level tones. For learners, they benefit from these two sites more on the learning of word-level rather than sentence-level tones. In terms of feedback for learners, there is no such provision on both sites.

From the review of the existing Hanyu Pinyin WBI, it can be concluded that there isn't any Hanyu Pinyin WBI that incorporates a mechanism capable of informing learners the accuracy of their pronunciations. To give feedback to learners, an ideal WBI has to be attached with speech recognition function. Unfortunately, the technology of speech recognition in Mandarin has not yet been developed into the maturity level to be used for instructional purpose (Chao 2003). The best that can be accomplished is to provide learners with three types of structured activities: (a) presentations, (b) drill and practice, and (c) simulations or game situations (Ariew 1999). Although WBI has limitations yet those learning Hanyu Pinyin assisted by WBI still gain more as these time-consuming tasks turn out to be what the computer is best suited for. Not only can these tasks take advantage of the consistency and patience of the computer, they can also capitalize on its data-handling and multimedia capabilities.

55.3 Research Design and Methodology

55.3.1 Sample and Sampling Techniques

This research focuses on first year elementary level Mandarin students at UiTM Penang campus. The research sample has been selected through stratified random sampling. Twenty eight students in UiTM Penang campus have been stratified according to different courses. They represent the Bumiputra Mandarin learners and the majority of Bumiputra learners have similar education background, culture, and language ability. Furthermore, the focus on UiTM Penang students is to make ease for research accessing and monitoring.

55.3.2 Data Collection

A total of 28 students in UiTM Penang campus were selected to attend a 4-h self-learning session using Hanyu Pinyin instruction in the language computer laboratory. A set of research questionnaire is given to each of them to find out their opinions about the instruction. As for feedback, respondents are given the following scale to indicate the level of agreement for each of the question

- 5 – Strongly Agree
- 4 – Agree,
- 3 – Neither Agree Nor Disagree
- 2 – Disagree
- 1 – Strongly Disagree.

55.3.3 Techniques for Analysis

To conduct the study, descriptive statistical tool was used. Results are tabulated and coded in the data file for the use of SPSS statistical analysis.

55.3.4 Survey Form

An evaluation form of WBI Hanyu Pinyin instruction was used to answer the research question in term of the suitability of content of the instruction, the structure of the content of the instruction, the appropriateness of the language used in the instruction and user friendliness of icon only.

55.4 Results

As shown in Table 55.1, 28.6 % of respondents strongly agree that the content is suitable. 53.6 % of the learners agree that the content is suitable. 10.7 % of the respondents neither agree nor disagree with the statement. Only 1 of the respondents (3.6 %) feels that the content is not suitable. None of the respondents strongly disagree that the contents is not suitable. There is one respondents did not submit the questionnaire.

As shown in Table 55.2, 17.9 % of respondents strongly agree that the content is well structured. 71.4 % of the learners agree that the content is well structured. 7.1 % of the respondents neither agree nor disagree with the statement. None of the respondents feel that the content is not well structured. There is one respondents did not submit the questionnaire.

Table 55.1 Learners' acceptance toward the suitability of content of the instruction

		Frequency	Percent	Valid percent	Cumulative percent
Valid	2.00	1	3.6	3.7	3.7
	3.00	3	10.7	11.1	14.8
	4.00	15	53.6	55.6	70.4
	5.00	8	28.6	29.6	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

Table 55.2 Learners' acceptance toward the structure of the content of the instruction

		Frequency	Percent	Valid percent	Cumulative percent
Valid	3.00	2	7.1	7.4	7.4
	4.00	20	71.4	74.1	81.5
	5.00	5	17.9	18.5	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

Table 55.3 Learners' acceptance toward the appropriateness of the language used in the instruction

		Frequency	Percent	Valid percent	Cumulative percent
Valid	3.00	3	10.7	11.1	11.1
	4.00	20	71.4	74.1	85.2
	5.00	4	14.3	14.8	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

As shown in Table 55.3, 14.3 % of respondents strongly agree that the language used is appropriate. 71.4 % of the learners agree that the language used is appropriate. 10.7 % of the respondents neither agree nor disagree with the statement. None of the respondents feel that the language used is not appropriate. There is one respondents did not submit the questionnaire.

Table 55.4 shows the learners' acceptance toward the user friendliness of icon of the Instruction. 14.3 % of the respondents strongly agree that the icons are user friendliness, while 64.3 % of the learners agree that the icons are appropriate. However, 17.9 % of the respondents are neither agree nor disagree with the statement. There is no respondents disagree or strongly disagree with the icons of the instruction. There is one respondents did not submit the questionnaire.

Table 55.4 Learners' acceptance toward the user friendliness of icon of the instruction

		Frequency	Percent	Valid percent	Cumulative percent
Valid	3.00	5	17.9	18.5	18.5
	4.00	18	64.3	66.7	85.2
	5.00	4	14.3	14.8	100.0
	Total	27	96.4	100.0	
Missing	System	1	3.6		
Total		28	100.0		

55.5 Conclusion

This research is to examine the acceptance levels of UiTM students towards the design of Guru Hanyu Pinyin web-based instruction (Romanised Mandarin Web-based). It deals with the suitability of content of the instruction, the structure of the content of the Instruction, the appropriateness of the language used in the instruction and user friendliness of icon only.

From the data Table 55.1, we can conclude that 82.2 % of the students feel that the content of the web-based Hanyu Pinyin instruction suits their level of proficiency. 10.7 % of the respondents neither agree nor disagree with the statement. Only 1 of the respondents (3.6 %) feels that the content is not suitable. There is a clear correlation between the online materials with the target learning objectives. Users undoubtedly benefit from this instruction and from the data in Table 55.2, we can conclude that 89.3 % of the students agree that the content is well structured. The sequence of information is logical and intuitive. Menus and paths to all information are clear and straightforward.

From the aspect of the language used in the web-based Hanyu Pinyin instruction, we can conclude that majority of the students feel that the language used is appropriate and easy to understand. None of the respondents feel that the language used is not appropriate. Regarding the user friendliness of icon, we can conclude that majority of respondents agree that the web-based Hanyu Pinyin instruction is user-friendly. The acceptance levels of the students towards the Hanyu Pinyin WBI are positive. Learners have no difficulty in using this Guru Hanyu Pinyin web-based instruction.

This research shows that the Hanyu Pinyin WBI has successfully provided an alternative to conventional teaching method. But there are some limitations need to pay attention. In terms of pedagogy, web-based learning does not have the advantage of promoting spontaneous interaction as in face to face communication. Traditional approach using on-campus learning focuses students' learning attention through easy communication with lecturer whereby lecturer could offer help to explain in more detail and provide interactive feedback. The WBI used is lack of a suitable infrastructure and database for accommodating test item and multimedia elements. Therefore it is recommended that the database should be attached to the instruction in order to allow adding, deleting and modifications of exercises and

quiz items being carried out with more flexibility by the user. The existing WBI design requires further improvements to encompass a well structured and interesting interface design with course syllabus and content. This will enable the web-based learning technology being easily accepted by new learners in view of its convenience and user-friendliness.

A well structured course syllabus, content and interesting interface design are important factors for learners to accept and use the web technology in learning the language. It is recommended that the contents of the syllabus should be revised because currently most syllabi are designed for conventional classroom learning environment. Therefore, the syllabi should be revised to suit web-based presentation. Thus more research should be conducted in the area of web-based course module development.

In view of the large Mandarin market potentials of Southeast Asia market, adopting web-based instruction in teaching Mandarin for non-native speakers generates great economic benefits. Some of the common benefits include reducing overhead expenses which makes the learning become very affordable for users, resolving the problems of insufficient qualified Mandarin instructors and lack of teaching materials for non-native speakers.

References

- Ariew, R. (1999). Computer-assisted foreign language materials: Advantages and limitations. *CALICO Journal*, 2(1), 43–47.
- Bourgerie, D. S. (2003). Computer aided language learning for Chinese: A survey and annotated bibliography. *Journal of the Chinese Language Teachers Association*, 38(2), 17–47.
- Chao, C. (2003). Mandarin Chinese pronunciation courseware. http://ml.hss.cmu.edu/mcall/chi-hyu/projects/SLA/SLA_Final.pdf. Accessed 21 Jan 2013.
- Clark, G. (1996). *Glossary of CBT/WBT terms* [one-line] (pp. 1–2). <http://www.clark.net/pub/nractive/alt5.htm>. Accessed 20 Jan 2013.
- Gavin, W. J. (2013, January). *The population of Southeast Asia* (ARI Working Paper, No. 196). http://www.ari.nus.edu.sg/docs/wps/wps13_196.pdf. Accessed 2 Jan 2014.
- Khan, B. H. (Ed.). (1997). *Web-based instruction* (p. 6). Englewood Cliffs: Educational Technology.
- Lim, et al. (2010). The process of designing and developing a romanised Mandarin web-based instruction on ISD methodology for non-native learners in Malaysia. In *ICENT 2010 conference* (pp. 459–462). Qinhuaangdao: IEEE.
- Relan, A., & Gillani, B. B. (1997). Web-based information and the traditional classroom: Similarities and differences. In Khan, B. H., (Ed.), *Web-based instruction, 1997a* (Vol. 43). Englewood Cliffs: Educational Technology Publications.
- Shao, B. (2005). *A brief introduction of online Hanyu Pinyin Web Sites* [Online]. Taiwan: International Conference on Internet Chinese Education. Retrieved December 20, 2009 from <http://edu.ocac.gov.tw/discuss/academy/netedu04/ICICE2005/html/paper2/C12.pdf>
- Xu, Z. (2005) *A review and evaluation of online Hanyu Pinyin Web Sites* [Online]. Taiwan: International Conference on Internet Chinese Education. <http://edu.ocac.gov.tw/discuss/academy/netedu04/ICICE2005/html/paper2/C08.pdf>. Accessed 20 Dec 2005.
- Zhang, J. (2006). *Hanyu Pinyin for Mandarin Speakers*, [Online]. Boston: MT. Retrieved November 21, 2006 from <http://web.mit.edu/~jinzhang/www/pinyin/>

Chapter 56

MITRANS Postgraduate Research Programs in Transport and Logistics: Program Outcomes Survey

Sariwati Mohd Shariff, Siti Haslinda Abd Halim, and Saadiah Yahya

Abstract All tertiary academic and postgraduate programs had successfully adopted the outcome-based education (OBE) curriculum design in Universiti Teknologi MARA Malaysia. Program outcomes survey needs to be carried out when the programs have completed one full cycle; however not much attention is given to OBE evaluation for postgraduate programs by research mode; and more so when these programs are delivered in a research center. The Malaysia Institute of Transport (MITRANS) offers two postgraduate (hereafter PG) programs: Master of Science and Doctor of Philosophy in Transport and Logistics. Henceforth, the objective of this study was to assess the programs learning outcomes at the end of 3 years. Nineteen respondents took part in a survey carried out in 2013. SPSS V18.0 analysis revealed that the PG program outcomes were achieved satisfactorily. Evidences of demonstrated knowledge, critical thinking analysis skills were evident. However, in pursuit of academic quest, findings showed that the PG research students were facing lots of challenges in the course of their studies. Findings of the study recommended that the research-learning environment, financial and family support, and communication need to be improved to ensure graduation on time. In conclusion, postgraduate students by research have to be mentally and emotionally prepared, possess perseverance and readiness not only to pursue the programs per se but also need to develop oneself in maturity and accountability. MITRANS hopes that the research postgraduates would become credible scientists with excellent research capabilities to further develop the transport and logistics industry for the country.

Keywords Outcome-based education • Postgraduate research • Curriculum design • Transport and logistics education

S.M. Shariff (✉) • S.H.A. Halim • S. Yahya
MITRANS, Universiti Teknologi MARA, 40450 Shah Alam, Malaysia
e-mail: sariwati@salam.uitm.edu.my

56.1 Introduction

For the past 20 years (1995–2015) the Ministry of Education and the higher education sector have been emphasizing towards knowledge-driven economy, knowledgeable workers, learning organizations, lifelong learning and human capital development. Likewise, these concerns have also been extensively discussed by employers, stakeholders in the job market and policy makers in Malaysia to ensure Malaysia is on track towards realization of high income economy and becoming a developed nation (MOE 2013; PMO 2014). Thus not only business and service organizations are focused with their organizational strategies in their businesses to remain competitive in global market; higher education also needs strategies to be competitive at the international level (Shariff and Ahmad 2013). People need to compete to become leaders and specialists in their own expertise and fields. As leaders and specialists, one has to be more knowledgeable and enhance skills and competencies through lifelong learning; thus the needs to upgrade one educational qualifications and achievements. This will directly or indirectly assist the nation towards realization of producing 60,000 PhDs (doctorates) in the country (MOE 2013). Nowadays, working people and university students need to equip oneself with new knowledge and technology, to acquire new competencies and skills on the jobs so as to be able to meet higher working standards and organizational expectations as well as career advancement (Shariff 2011). The trends of working people and young adults pursuing continuing education have been increasing. Likewise, more and more degree graduates are keen towards pursuing master and doctoral or professional programs.

Additionally, the numbers of institutions of higher learning (IHLs) providing continuing education, academic tertiary and postgraduate programs have been growing due to this increasing demand for lifelong learning in Malaysia (Shariff and Saad 2010). There are 28 public universities and more than 500 private universities and colleges in Malaysia that offer degree and postgraduate programs to cater to the demand for continuing education (MoE 2013). Prospective candidates nowadays have plenty of options to select IHLs depending on their choice(s) of academic programs, locations, fees, duration of study and the modes that suit their learning and educational needs; and not forgetting the team of academic expertise and professors available in that IHLs. Thus, there are now many avenues and options for these working people and degree graduates to pursue continuing postgraduate education either through formal education on full-time day classes, or part time basis offered in evening classes, during weekends, or through e-learning (distance learning), or professional programs, or specially designed executive programs with collaborations with institutions of higher learning (IHLs) for postgraduate programs. Academic and education programs are now available in many modes: the conventional mode (programs with full dissertation); mixed mode (courses with partial dissertation); normal versus fast-track mode; coursework versus by research; face-to-face versus blended mode, and recently flexi mode, to mention a few.

56.2 Literature Review

56.2.1 *Global Knowledge Advancement*

In the globalization era of knowledge and technology in the twenty-first century, education is part and parcel of life (MoHE 2006). Education has now become a lifelong process for almost many individuals from various backgrounds in seeking new knowledge and skills beyond the basic compulsory education and the current work experience. The advancing global market, technological advancements and innovations, generation of new knowledge, formulation of radical business strategies and state-of-the art operational techniques, new flexible product and service designs, latest system applications in industry are the main factors that influence working people and graduates to pursue further continuing education to equip oneself for these challenges (Mohd Shariff 2010). There is a growing demand for competent and knowledgeable workforce in the job market. Employers nowadays have high hopes that the prospective employee will be able to contribute the knowledge, skills and values in them with certain level of fitness for the particular job (Ministry of Human Resource Press release; New Straits Times, May 26th 2003; www.mohr.gov.my). This scenario was in 2003; but now in 2014, Malaysia needs a generation of critical thinkers who are able to face the challenges of tomorrow, especially in this digital age and computerization (Wan Norliza 2014). “Malaysia has to strategize and devise a plan fit in the global economy after 2020 and to face the medium term challenges. To ensure sustainable growth beyond 2020, Malaysia has to stop relying on its natural resources due to the volatile prices and limited supply; but to focus more on knowledge intensive sectors where opportunities are self-generated, of which the more you know, the more opportunities are” quoted (Comin 2014). This Dean from Harvard Business School also reemphasized that there is a need to create a knowledge-friendly ecosystem where knowledge is produced and assimilated, universities and research institutes must distribute it to companies.

Based on this global knowledge advancement there is a steady and positive trend where working people are now competing to enhance their knowledge and academic qualification by enrolling themselves in part-time and full-time postgraduate education. There is high demand for continuing education, particularly postgraduate education as one needs to keep abreast with: (1) the fast changing information technology, (2) the changing nature and eruption of new knowledge, (3) the increasing organizational complexity, (4) the drive to maintain excellence, (5) the demand for professional accountability, (6) the needs for higher academic qualifications and status and (7) the shifts in governmental regulations with higher job standards requirements (Comin 2014; MoE 2013). Heading towards a borderless world as perceived by globalization, therefore education is now a big business (Angle and Lawson 2012).

56.2.2 National Higher Education Strategic Directions

The primary goals of Malaysian education system in the National Philosophy of Education (NPE) are towards realizing the social and economic objectives of the nation (MOHE Report 2006). Thus, education is an ongoing effort towards developing the potentials of individuals in a holistic and integrated manner so as to produce Malaysian citizens who are knowledgeable and competent, possess high moral standards, and are responsible and capable of achieving a high level of personal well-being for the betterment of the society and the nation at large (MOHE 2006). Recapulating, the Malaysian educational visions (in 1991) towards the 2020 goal were based on eight thrusts namely: unity, management and leadership; caring service; empowerment, knowledge culture; caring schools; culture of excellence; and monitoring system. The Malaysian educational vision remains focused on enlightening every citizen to see human and national development as intertwined: society, environment, culture, economy, scientific and technological advances (Ahmad Bajunid 2014).

The last decade (2005–2014) saw rapid development of Malaysia towards a knowledge-based society, human capital development and competing of new emerging economies over the world that necessitate the needs towards lifelong learning and higher continuing education in the country (MoE 2013). The catalysts were integrated via national government transformation plans (GTPs), the economic transformation plans (ETPs), the National Key Economic Areas (NKEAs) coupled with the Tenth Malaysian Plan (10MP) towards a high income economy nation (PMO 2013). “There is a realization that our students who are going to be future generation are prepared to function in a society that is technologically rich and ready to face the challenges of the next millennium” quoted Wan Norliza (2014). In-line with these future directions, private and public IHLs are competing aggressively to adapt to these rapid changes and development in the educational sector in the country (Komoo and Omar 2014). Therefore, the top management in all these institutions are urged to reexamine and reevaluate their roles and governance and status on achievement of the National Higher Education Strategic Plans (NHESP 2007–2020) in each institution and to leverage further on their leadership and governance of the university, leadership in research and innovations, holistic students development, sustainability and autonomy, general policies of public universities, integrity and the roles of universities towards realization of the Malaysian Vision 2020 (Komoo and Mohd Idris 2014; Nordin 2013).

56.2.3 New Roles of Institutions of Higher Learning (IHLs)

The Malaysia Education Blueprint (2013–2025) was launched by Ministry of Education (MoE) in 2013 which outlines the long term policy directions to transform the national education system and improvements. “The blueprint establishes a

clear sequence of priorities to ensure that the return on investments is optimized in terms of the results that matter most: student outcomes. The five aspired outcomes of the Malaysian education system as a whole are: access, quality, equity, unity, and efficiency” (MoE 2013).

To ensure the roles of IHLs are relevant, academic curriculums must be updated to meet the needs of the people and the job industry. The move towards applying outcome-based education (OBE) in teaching and learning; and instructional delivery at tertiary education has been one of the most widely considered topics in educational sector in recent years (Mohayidin et al. 2008). Thus, outcome-based curriculum design programs were implemented in this local public university in 2010. In conjunction with that, the Certificate in Education (CiED) was also launched in the same university to upscale the quality of teaching and instructional delivery of the academicians (CiED 2012, 2013).

56.3 Continuing Education: Postgraduate Program

56.3.1 Continuing Education and Lifelong Learning

In Malaysia, the access and opportunities for life-long learning and continuing education has now become one of the national key result area (NKRA) and strategy: every citizen is given ample opportunity and support to upgrade one’s knowledge and skills and life-long learning (MoHE 2006; MoE 2013; www.moe.gov.my). In fact, there are many nations throughout the world with major national initiatives towards lifelong learning culture; one of which is United Kingdom through their National Committee of Inquiry into Higher Education (NCIHE) Report (1997). According to this report “the aim of higher education should be to sustain a learning society; with four main purposes: to inspire and enable individuals throughout life, so that they grow intellectually, are well prepared for work and can contribute effectively to society and achieve personal fulfillment; to increase knowledge and understanding for their own sake and to foster application to the benefit of economy and society; to serve the needs of an adaptable, sustainable, knowledge-based economy at local, regional and national level”.

Life-long learning is the process of acquiring and expanding knowledge, skills and dispositions throughout life to foster well-being (Suyurno 2005). Living in a globalization world makes life-long learning a must (Amer al-Roubaie 2003) quoted by Suyurno (2005). The Islamic perspectives and Pillars of Islamic Code of Education, learning goals are towards developing human resources for the betterment of mankind; building a balanced personality possessing within its domain material, spiritual and conceptual elements on harmonious basis; guiding people to scientific methods of thinking, learning and knowledge acquisition, expertise and specialization in various fields; creating a systematic Islamic thinking which leads people to conform in every thought and

deed according to Islamic code; making people discover their innate talents; and making people conscious of the Creator and to induce in them towards correct vision of life and the Hereafter (Suyurno 2005).

56.3.2 Reasons for Pursuing Postgraduate Programs

According to the Critical Agenda Project (CAP) MYBRAIN 15 report, there was only 16,718 Malaysians PhD (Doctor of Philosophy) reported in end 2013 (Berita Harian 2014). In 2014, this CAP project has now imposed strictly on graduation on time (GOT) where full-time postgraduate students in this scheme are entrusted to complete their studies within 48 months and 72 months for part-time study so as to achieve the target of 60,000 PhD holders by end 2023. Thus, working people and young adults or graduates whom had completed their tertiary degree programs but are not working or still looking for potential jobs are encouraged to pursue postgraduate programs. Continuing education or post graduate programs means to pursue further formal learning at higher levels in the quest for more knowledge, skills and competencies via academic or educational programs that are available at formal IHLs or colleges (Shariff 2011). The context of this paper in continuing education refers to pursuit of postgraduate programs, namely master and doctoral programs. Postgraduate programs are aplenty offered in Malaysia with the growing numbers of IHLs offering many choices of postgraduate programs across all fields from science and technology, art, social science and humanities, business and management, medical and pharmacy.

According to Mohamad and Mohd Jaffar (2013), the most common cited reasons for working people and young adults engaging in continuing postgraduate education are job-related motives, personal development, personal interest, professional or career upgrading, difficulties to secure a job and given opportunity of scholarship or grants. With the increasing number of jobless graduates and some working temporarily in jobs that they do not like, the natural tendency is to enroll into postgraduate program while waiting for the right opportunities. Working adults pursue education for future changes in their lives, due to life transitions, and learning for its own sake (Merriam and Caffarella 2008). Merriam and Caffarella (2008) quoted Morstain and Smart (1974) research revealed that adults engage in continual education because of social relationship factor that is, to make new friends; external expectations factor that is, complying with the wishes or directives of an authority; social welfare factor namely, the learners want to serve others or their community; professional advancement factor which is associated with job enhancement or professional advancement; escape or stimulation factor – where learners who want to alleviate boredom or escape from home or routines; cognitive interest factor that is for the sake of learning itself. Contrarily, Houles (1961) described that adults have different sets of learning orientations: some adults are goal-oriented learners who use education as a means for achieving some other goals; activity-oriented learners

who participate for the sake of the activity itself; and the learning-oriented adults who seek knowledge for its own sake.

56.3.3 *Characteristics of Adult Learners*

Postgraduate students are generally young adults (age less than 30 years old) and grown up adults who are working people with work experiences. The age differences determine the level of intelligence (cognitive), level of maturity, rational and emotion stability (affective) and the character of the individual (Knowles 1973). These student's characteristics do affect their learning effectiveness. These characteristics consist of motivation-related constructs (motivation to learn and transfer learning) and ability constructs (knowledge acquisition, situation identification and personal capacity to transfer) also known as self-efficacy (Knowles et al. 1998).

However, the adult learning processes may vary and highly dependable on situations. Merriam and Caffarella (2008) quoted "adult learning are based on five assumptions on the adult learner: (1) as a person matures, his/her concept moves from that of a dependent personality towards one of a self-directing human being; (2) an adult accumulates a growing reservoir of experience, which is a rich resource for learning; (3) the readiness of an adult to learn is closely related to the developmental tasks and social roles; (4) an adult is more problem-centred than subject-centred in learning; (5) adults are motivated to learn by internal factors rather than external factors." Henceforth, both pedagogy-andragogy principles are applicable within a continuum range from teacher-directed to student-directed learning, and that both approaches are appropriate with children and for both young adults and adults. Understanding this principle is crucial particularly in understanding the young adults' characters and motives in pursuing master and doctoral programs. At the early stage an adult learner may be dependent on the facilitator and requires close supervision and coaching, but when he/she has adapted into the learning culture and involved in the learning system, the facilitator may only need to monitor, and subsequently the rest lies on the learner to be in control of his learning (Knowles et al. 1998).

Knowles et al. (1998) further elaborated that adults are ready to learn when they need to know and be able to do in order to cope effectively with their real-life situations. Adult learning is life-centered or task/problem-centred, and they learn new knowledge, understandings, skills, values and attitudes. Adults are more responsive to pursue learning due to external motivators such as better job prospects, promotions and higher salaries with higher educational qualifications; and strong internal motivators through increased self-esteem, quality of life and job satisfaction. Based on the above literature, it can be outlined that successful adult learners who engaged in postgraduate programs must possess these characteristics:

- (a) *motivation to learn*: the believe that they can learn new things, and learning helps to solve a problem that is important in their jobs or tasks. Adults are

motivated to participate in learning activities by developmental issues and changes in their lives.

- (b) *readiness to learn*: ready to learn things that needs to know and be able to do in order to cope effectively with real life situations. The implication of this assumption is the importance of timing and learning experiences to coincide with their developmental tasks and social roles; and being responsible for their own decisions, for their own lives.
- (c) *self directed learner*: adults are self directed learners who take primary initiatives for planning, carrying out and evaluating their own learning experiences. Self directed learning is a combination of factors such as learning opportunities people find in their environment, the personality characteristics of learners, cognitive processes and the context of learning which collectively interact to form episodes of self directed learning.

56.4 Postgraduate Research Program in MITRANS

Malaysia Institute of Transport (hereafter MITRANS) is a research centre with its core functions to carry out research, consultancies and training focusing on transport, logistics and supply chain management (MITRANS 2013). It started as a small unit of transport studies in the School of Business in 1982 in one of the local public university. Over the 33 years, this research centre has crafted as one of the leading research institute in transport and logistics in Malaysia with proven track records on research done for the national government, agencies and authorities, and government-linked companies in policies and regulations related to transport and logistics matters and supply chain management in Malaysia. This research centre offers two postgraduate programs by research, namely Master of Science (LT780) and Doctor of Philosophy in Transport and Logistics (LT990) starting 2010. Presently as on October 2014, MITRANS has 50 postgraduate research students undertaking master and doctoral program full-time and part-time. These programs by research are run in MITRANS which is located at the Old Engineering Block in Universiti Teknologi MARA, Shah Alam main campus (MITRANS 2013).

In 2010, OBE curriculum design was imposed on all degree and postgraduate programs. OBE abbreviates for outcome-based education that adopts “organizing for results based on the outcomes that to be achieved” (Spady 1988). OBE had been successfully implemented in the Faculties of Engineering way back in early 2000 (Naim et al. 2010). OBE curriculum design refers to: defining, focusing and organizing an educational program that focus clearly on the essentials for all students to be able to do successfully at the end of their learning experience (Spady 1994; Jantan 2012a, b). Thus, MITRANS postgraduate programs were in tandem with the OBE curriculum deployment in the university and established its complete set of their postgraduate programs educational objectives, program and learning outcomes for the two postgraduate research programs as shown in Table 56.1:

Table 56.1 Program educational objectives

PEO	Program educational objectives
1	Professionals who lead in the quest for knowledge and skills in the dynamic environment of transport and logistics
2	Professionals in transport and logistics with exemplary communication and social skills
3	Professionals with positive traits, high critical thinking and ethical values
4	Professionals who promote continual knowledge advancement to create opportunities in the transport and logistics industry
5	Professionals with leadership qualities and capabilities to promote the transport and logistics profession at the institutional, national or international level

Table 56.2 Program outcomes (LT780)

PO	Program outcomes
1	Conduct and report scientific investigations in the area of transport and logistics
2	Write and justify the problem, concepts, theories, models, methodology, findings and discussion in the area of transport and logistics
3	Develop critical thinking, synthesis and evaluation of new and complex issues in written and verbal communication
4	Contribute significantly to the body of knowledge in transport and logistics through original research and meeting the international standards
5	Make an independent assessment through written and verbal communication in the field of transport and logistics to the scholarly community and society at large

Table 56.3 MITRANS PG students as on October 2014

Program	Master LT780	PhD LT990	Total
Full time	24	19	43
Part time	3	4	7
Total	27	23	50

Table 56.2 presents the description of the program outcomes (POs) for the postgraduate programs by research in MITRANS. The master program (LT780) had attained the MQA accreditation in 2012; while the doctoral program (LT990) is expected to attain the MQA accreditation by December 2014 when the first doctoral postgraduate completes the viva-voce. As of to date, MITRANS has produced six successful graduates as on October 2014.

As of October 2014, MITRANS has a total of 50 postgraduate (PG) students with 27 Master and 23 PhD students with the breakdown shown in Table 56.3.

Majority of the PG students are sponsored under the University Young Scientist Scheme (7); seven (7) are sponsored under the Ministry of Education (MyBRAIN15) scheme; five (5) with staff scholarship and the others are provided with grants as Graduate Research Assistant (GRAs). The research conducted by these PG students are focused on seven areas, namely: (1) transport and logistics in the country; (2) urban and public transportation; (3) cross borders and trade facilitation in the ASEAN region; (4) safety, legal and regulatory; (5) maritime; (6) supply chain man-

Table 56.4 Typical postgraduate program by research outline (full time mode)

Outline	Master program (LT780)	Doctoral program (LT990)
Year one	Attend Research Methodology Modules	Attend Research Methodology Modules
	Do Literature Reviews	Do Literature Reviews
	Decide Topic of Research	Decide Topic of Research
	Develop Research Design	Do Complete Research Proposal
	Complete Research Proposal	Proposal Defence
	Defense Research Proposal (DRP)	
	Organize Access for Data Collection	
	Develop Research Instruments	
Conduct Pilot Study		
Year two	Carry Out Data Collection and Analysis	Develop Research Design
	Do Data Analysis	Oganinize Access for Data Collection
	Analyse Findings	Develop Research Instruments
	Prepare Thesis	Conduct Pilot Study
	Intention to Submit Thesis	Carry Data Collection and Analysis
	Submission of Thesis	
Viva Voce		
Year three	Continue (if needed)	Complete Data Analysis
		Analyse of Findings
		Intention to Submit Thesis
		Submission of Thesis
		Viva Voce

agement and operations; and currently embarking on (7) *halalan-toyyiban* supply chain management matters. Table 56.4 presents the outline of the postgraduate programs in Transport and Logistics in MTRANS with duration of study of 2 years (four semesters) for full-time master; and 4 years (eight semesters) maximum for full-time doctoral program. PG master students are also required to undergo (1) IGS Research Skills course in part/semester one of the program which is conducted by the Institute of Graduates Studies; and (2) Defense of Research Proposal (termed DRP) in semester/part two in the program which is an oral examination on the research proposal (IGS 2013).

56.5 Data Analysis and Results

A survey was carried out in 2013 as the master program by research (LT780) had completed its first full OBE cycle since its introduction in 2010; while the doctoral program is due to complete its cycle in 2014. The survey was done during the MITRANS postgraduate students’ briefing session in the new semester March 2013. A self-developed questionnaire consisting of four sections namely: (1) respondents’

Table 56.5 Respondents profile on LT780 (master)

Program	Master LT780	PhD LT990	Total
Gender:			
Male	4	2	6
Female	10	3	13
Age:			
<25 years	5	0	5
26–30	7	1	8
>36 years	2	4	6
Mode			
Part time	2	2	4
Full time	12	3	15
Parts			
1–2	6	0	6
3–4	4	2	6
5–6	3	2	5
>7	1	1	2
Sponsorship			
MoHE	6	1	7
UiTM	2	2	4
None	6	1	7
Others	0	1	1
Main supervisor			
MITRANS	13	5	18
Faculties	1	0	1

profile; (2) OBE; (3) open-ended questions; and (4) customer satisfaction survey was used; using a 5-point Likert scale. The actual survey was done for all PG students (both master and PhD); however data analysis for master program, LT780 was reported for this paper as this program had completed one OBE cycle (2010–2013). Fourteen respondents (35 %) responded to this survey from the total of 40 registered students in the system; 10 female (71 %) and 4 males (29 %). Female PG students outnumbered the males in this master program by research in this centre. Detailed profiles of respondents were shown in Table 56.5.

Analysis was done separately for master (LT780) and PhD (LT990) as these two programs differed in duration and extent of study. All items in the questionnaire were tested for alpha-cronbach reliability with 0.763 (minimum) and 0.947 (highest) indicating all tested items were reliable. A 5-point Likert scale was used in the survey. Analysis on LT780 program educational objectives, program structure and its outcomes revealed consistent mean scores of 4.125 (satisfactory); this concurred with the program entrance-exit (E-E) survey (mean score 4.036) carried out on five MITRANS graduates. Figure 56.1 below revealed the results on the learning outcomes as perceived by the master students with mean scores of 3.911–4.286 (good). Table 56.6 outlined the description of the intended program learning outcomes.

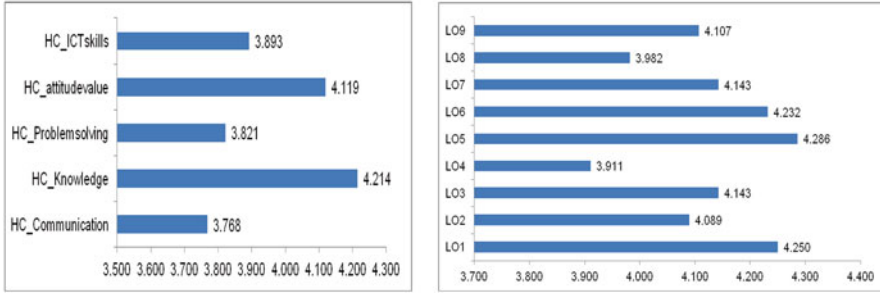


Fig. 56.1 LT780 learning outcomes

Table 56.6 Learning outcomes LT780 (master)

Learning outcomes (LOs)	Description
LO1	Knowledge
LO2	Practical skills
LO3	Critical thinking and problem solving skills
LO4	Communication skills
LO5	Team work and social skills
LO6	Ethics and values
LO7	ICT and lifelong learning
LO8	Entrepreneurial skills
LO9	Leadership skills

Source: MITRANS (2010) and UHEK-OBE (2010)

Table 56.6 presents the program learning outcomes for the LT780 program. Analysis revealed a majority of the program learning outcomes were achieved except for LO4 (communications).

Assessment on IGS Research Skills Workshop which was conducted by Institute of Graduate Studies of the university was also surveyed. IGS research skills workshop is a mandatory course before a postgraduate student proceeds for Defense of Research Proposal (DRP). Analysis showed the PG students were satisfied with the conduct of this workshop as this was the introductory stage in doing a research for them to acquire scientific research skills. Figure 56.2 presents the IGS Research Satisfaction Survey with mean scores of 3.917–4.333 (good).

Figure 56.3 shows the students’ satisfaction survey towards MITRANS on its infrastructure in terms of provision of basic facilities, the learning/research environment and the management staff in MITRANS. Overall, the PG students were satisfied as shown with mean scores of above 4.00.



Fig. 56.2 IGS research skills survey

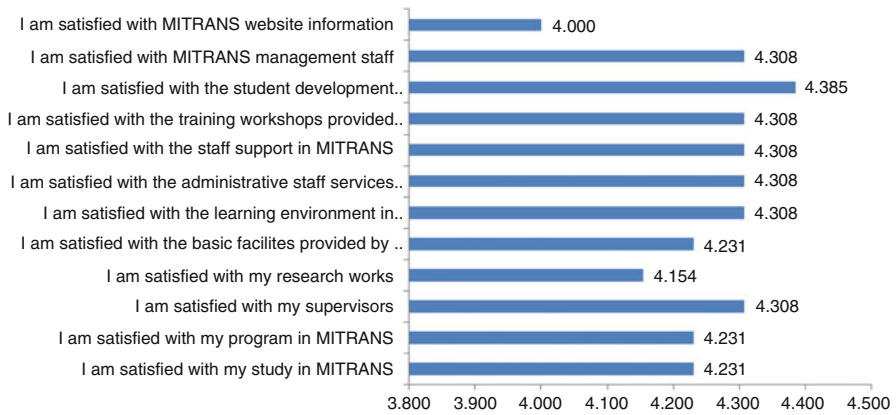


Fig. 56.3 PG satisfaction survey

56.6 Discussions

Based on the analysis, this study inferred that the program educational objectives, research program structure, the master program outcomes and its learning outcomes were adequate and satisfactory (all mean scores stood at 4.00) and met the program OBE requirements and expectations. Even though the OBE program outcomes were achieved and demonstrated with the research outputs (thesis and publications) and six graduates, the PG students undertaking program by research had their problems in the course of their study. From the initial intake of 50 PG students (inclusive master and PhD) in 2010, ten PG students had withdrawn from the programs (8 masters; 2 PhD) with an average attrition rate of 2 PG students per semester for the past 3 years (2010–2013). Based on the PG students’ records and interviews with the PG students themselves, the following reasons were cited as the main factors

causing the attrition rate and also the inability to complete within the duration of the study: (1) starting a family (married) and transfer (follow spouse); (2) having new family members (giving births); (3) going back to hometown; (4) doing part-time works due to financial constraints; (5) too much RA (research assistant) works; (6) could not focus in the study; (7) supervisor(s) are far away. Only relatively few PG students (three students) quitted officially via the proper exit/withdrawal procedures but the majority (seven) went missing in action.

Further analysis also revealed that most of the postgraduate students were not able to complete their program within the stipulated time duration for full-time and part-time too. Analysis showed that a majority of the master students were research assistants (RAs) and they were engaged with major research together with their supervisors; secondly lack of time management and focus in their study. The students' priorities were focused on the completion of the research and research reports; and completing their thesis was secondary. Thirdly, the delay in completion of their study was caused by lack of mastery of English language; and this caused constraints delaying the process of thesis writing. Fourthly, the lack of frequency of meetings and communications with the supervisors affected the progress of the study. The postgraduate students claimed that the supervisor (s) were busy; contrarily the supervisors rebutted stating PG students were not proactive in meeting them. There were three cases where the students were far from the main campus in Shah Alam: one in Kelantan, Johor Bahru and another had relocated job in Sarawak. Henceforth, even though the OBE program objectives and outcomes were met and produced six successful master graduates, there were other intangible outcomes that resulted from postgraduate programs despite the challenges faced by these students being young adults who were also starting a new family; facing financial constraints and family commitments; distance and most importantly too long in the program causing the motivation and personal resilience to erode. Based on the findings of this study, several measures were taken and following were the recommendations:

1. To conduct a welcome and briefing session for every semester with all PG students together with MITRANS management and Head of Postgraduate Studies. This session serves as important platform for PG students to seek assistance, coaching and advice from the management or colleagues; and to discuss with each other on the research progress; and to enhance good communication. This meeting is to demonstrate the management commitment and concern on the well-being and academic progress of the PG students; to share their problems (financial and family); as well as updates, status and new issues or changes are disseminated to the students,
2. To conduct a colloquium session every semester for all PG students to share their research progress; to enhance their writing and communications (presentation skills); and to foster the research-learning environment. Colloq session is to be conducted on the second last week before the semester ends. This serves as part of the assessment system to appraise PG students' progress. Increasing the frequency of presentations and writing of papers will enhance the abilities to express their thoughts, ideas and findings into oral and written communication.

3. PG students are required to submit the PG Research Logbook to their supervisors after each consultation; and all logbooks are to be submitted to the Head of Program for endorsement during the submission of Student Progress Report. This requires cooperation from all supervisors for the PG students.
4. Formation of PG society and execution of PG social activities are recommended as these provide means to release work-study stresses and exposures to realities of life. Visits and community services are recommended to be organized by the PG students themselves; and the research centre is also recommended to assist students in financial support as and when appropriate such as having regular potlucks and free meals; and extra monetary support for adhoc research activities.
5. Supervisors are recommended to remind the PG students on their time management, commitments and priority to the postgraduate research and thesis writing; and in lieu of difficulties supervisors are to advise them to see the Academic Officer, Head of PG Studies and the Director/Deputy Director of MITRANS respectively. Young adult postgraduate students have more preferences communicating with the younger executives due to the same age, easily accessible through the use of latest social media such as WHATAPPS or TWITTER, etc.
6. To formulate a systematic assessment and evaluation of PG students progress and performance with some form of standard reference and consistent throughout the course of the program. The present evaluation of the students' progress is based on In-progress (*Sedang Maju*), First Warning (*Amaran 1*) and based on the number of meetings with the supervisor through the use of one form; this does not truly reflect the actual progress of the PG students in the course of their study. The failure to ascertain/measure the real progress is one of the factors that caused the delay and extension of their study. It is recommended a learning contract system to be initiated by the PG student himself for each and every semester and that this is to be used for evaluation beside the Gant Chart that was presented during the part/semester 1 in the program.

56.7 Conclusion

Closing the loop in outcome-based education is necessary to assess and evaluate the outcomes of the academic program by research; and at the same time to identify other outcomes that are not stipulated in OBE. OBE outcomes are actually more than just meeting the OBE and MQA documents requirements but the intangible outcomes that transpired from the program be it positive and negative outcomes from the programs. OBE outcomes for academic programs by research are easily monitored; but not the academic performance as students' academic progress evaluation are subjective. Furthermore, the student academic progress is closely knitted to the research performance undertaken by the PG students. The next OBE closing the loop awaits for the PhD program (LT990) with three PhD postgraduate students submitting their thesis in 2014; as well as pending the MQA accreditation. In

conclusion, candidates intending to pursue postgraduate programs by research have to be mentally ready and emotionally prepared, possess perseverance, motivation and readiness not only just to pursue the masters and doctoral programs but also towards personal development and quality of life; and to be able to demonstrate the attainment of program educational outcomes and MITRANS are able to produce graduates on time. With OBE, and the transformation of education curriculum that focuses on higher order thinking skills (HOTS) hopes to produce knowledgeable graduates with critical, creative, scientific and analytical skills that can serve the job market and compete at the international level (Lim 2014). Last but not least, this research centre aims to produce quality postgraduates as young scientists in the transport and logistics industry for the country.

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References

- Ahmad Bajunid, I. (2014, March 7). Having a vision is about managing resources. *New Straits Times*.
- Angle, & Lawson. (2012). Changes in affective and continuance commitment in time and relocation. *Journal of Business Research*, 4(1), 3–15.
- Berita Harian* (2014, February 20). Menjana graduan PHD: Strategi teliti realisasi sasaran lahor 60,000 lulusan PhD.
- Blooms. (1956). Cited in Knowles, M. S., Holton, III E. F., Swanson, R. A. (1998). *The adult learner*. Houston: Gulf Publishing Company.
- Certificate in Education (2013). Retrieved from <http://www.ilqam@uitm.edu.my>
- Certificate in Education Manual* (2012). First edition. ILQAM, Universiti Teknologi MARA, Malaysia.
- Comin, D. (2014, January 15). Don: Prepare beyond ETP. *Business Times. New Straits Times. Faculty of Business Management and OBE training manuals* (2010). UiTM Shah Alam. www.uitm.edu.my/fbm
- Houle, C. O. (1961). *The design of education*. Jossey – Bass Publishers.
- ILQAM. (2012a). Training programs and calendar. Retrieved from <http://www.uitm.edu.my>
- ILQAM. (2012b). *Certificate in education*.
- ILQAM. (2013). Annual report 2013. Retrieved from <http://www.ilqam.uitm.edu.my>
- IGS (2013) or IPSIS (2013). (Institute of Pengajian Pascasiswazah, 2013). Retrieved from <http://www.ipsis.uitm.edu.my>
- Institute of Graduate Studies (IGS). Retrieved from <http://www.ipsis.uitm.edu.my>
- Jantan, J. (2010a, March 15). *ILQAM OBE curriculum design manual*. UiTM.
- Jantan, J. (2010b). Notes on outcome-based education curriculum design. Refer to: <http://drjj.uitm.edu.my>
- Journal for the Scholarship of Teaching and Learning*, 2(1). 2011.
- Knowles, M. S. (1973). *The adult learner: A neglected species*. Houston: Gulf Publishing Company.
- Knowles, M. S., Holton, E. F., III, & Swanson, R. A. (1998). *The adult learner*. Houston: Gulf Publishing Company.
- Komoo, I., & Mohd Idris, M. F. (2014). *Dialog Meja Bulat Naib Cancellor: Memacu Universiti di Malaysia ke Arah Kecemerlangan*, AKEPT. Penerbit Universiti Malaysia Terengganu.

- Komoo, I., & Omar, R. (2014). *Dialog Meja Bulat Naib Cancellor: Memacu Universiti di Malaysia ke Arah Kecemerlangan*. AKEPT. Penerbit Universiti Malaysia Terengganu.
- Malaysia Education Blueprint 2013–2025 (2013). Retrieved from <http://www.moe.gov.my>
- Malaysia Institute of Transport (MITRANS). (2013). Retrieved from <http://www.mitrans@uitm.edu.my>
- Malaysian Qualifications Agency (MQA). (2012). <http://www.mqa.gov.my>
- Malaysian Qualifications Framework (MQF). Malaysian Qualifications Agency (2007). <http://www.mqa.gov.my>
- Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2008). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco: Jossey Bass Publishers.
- Ministry of Education. (2013). Retrieved from <http://www.moe.gov.my>
- Ministry of Higher Education (MoHE). (2011). <http://www.mohe.gov.my>
- Ministry of Human Resource. Retrieved from <http://www.mohr.gov.my>
- Mohamad, D., & Mohd Jaffar, M. (2013). Some strategies on enhancing marketability and employability of mathematics graduates of UiTM. In *Academic conference 2013*. Malaysia: University Teknologi MARA.
- Mohayidin, M. G., Suandi, T., Mustapha, G., Konting, M. M., Kamaruddin, N., Man, N. A., Adam, A., & Abdullah, S. A. (2008). Implementation of outcome based education in University Putra Malaysia: A focus on student's learning outcomes. *International Education Studies*, 1(4), 147.
- Mohd Shariff, S., et al. (2010). *Operations management: Practical OBE approach*. Malaysia: UiTMPRESS.
- MOHE. (2006). Module (*Modul Pembangunan Kemahiran Insaniah untuk IPTA* (Translation: Module for Soft skills Development for Public Universities, 2006). Universiti PUTRA Malaysia.
- MOHE Report. (2006). *Towards excellence. Report by the Committees to Study, Review and Make Recommendations Concerning the Development and Direction of Higher Education in Malaysia*, UPENA, UiTM Malaysia.
- Naim, N. F., & Hashim, H., et al. (2010). OBE performance evaluation tool for electrical engineering laboratory. In *Conference proceedings 2010 international conference on networking and information technology*. IEEE. ISBN 978-4244-7578-0.
- PMO (Prime Minister Office). (2014). Retrieved from <http://www.pmo.gov.my>
- Shariff, S. (2011). Curriculum review on business management programs towards realization on outcome-based education (OBE). *Dana Kecemerlangan final report*. Research Management Institute. Malaysia: Universiti Teknologi MARA.
- Shariff, S., & Ahmad, I. (2013). Unpublished FRGS Report. *Environmental innovation theory in environmental management system in polypropylene (PP)*. Malaysia: Universiti Teknologi MARA.
- Shariff, S., & Saad, S. (2010, June). Readiness to learn among off-campus adult learners and perceptions on their learning outcomes. In *Conference proceedings on International Conference on Arts, Science & Technology (ICAST)*.
- Shariff, S., Saad, S., & Ibrahim, A. H. (2006). Evaluating industrial training for continual improvement in learning among undergraduates. *IRDC*, Universiti Tekinologi MARA.
- Spady, W. (1988). Organizing for results: The basis of authentic restructuring and reform. *Educational Leadership*, 46(2), 4–8.
- Spady, W. (1993). *Outcome-based education*. Belconnen: Australian Curriculum Studies Association.
- Spady, W. (1994). Choosing outcomes of significance. *Educational Leadership*, 51(6), 18–22.
- Suyurno, S. S. (2005). The way Islam looks at the concept of life-long learning. In *Proceedings National Tertiary Education Conference (NCTE) 2005*. Universiti Teknologi MARA, UPENA.
- Wan Norliza Wan Mustapha. (2014, March 4). Demand for higher order thinking skills. *New Straits Times*.

Chapter 57

Plagiarism in Academic Writing Among TESL Postgraduate Students: A Case Study

Aisyah Hani Mohd Habali and Lee Lai Fong

Abstract This case study aimed to gain insights into plagiarism among postgraduate students. It examined the extent of plagiarism, sources of plagiarism, types of plagiarism and causes of plagiarism among four students from the Master in Education in Teaching English as a Second Language (M.Ed TESL) programme in a public university in Malaysia. The instruments were written assignments, interview and self-reflection reports. The extent of plagiarism and the sources of plagiarism were facilitated through the use of Turnitin software. Analysis of participants' writing and original sources was done to determine the types of plagiarism in the students' writing. The findings showed that plagiarism existed in the students' writing. They plagiarized mainly from Internet, publications and students' paper and the types of plagiarism found were sham, verbatim, illicit and patchwriting. Data from interviews and self-reflection reports which were qualitatively analysed indicated that personal voice, time management, language proficiency and academic writing skills caused plagiarism. The findings imply that awareness of plagiarism should be instilled at postgraduate level. Postgraduate students should also be guided by the faculty in enhancing their academic writing skills. This can increase self-efficacy to deter plagiarism in line with Bandura's self-efficacy theory highlighted in this study.

Keywords Plagiarism • Postgraduate students • Self-efficacy theory

57.1 Introduction

Academic writing skill has become a key measurement in succeeding in tertiary education (Arkoudis and Tran 2010; Pecorari 2006). The ability to summarize, paraphrase and synthesize information in producing written work which reflects the identity and originality of a student is an important characteristic of a successful

A.H. Mohd Habali (✉) • L.L. Fong
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: aisyahhanihabali@gmail.com; leela679@salam.uitm.edu.my

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academic writer. Moreover, producing quality academic writing also makes students to be more critical in thinking (Lee and Tajino 2008). Nevertheless, academic writing is not an easy task for many second language students including postgraduate students. There is an increasing number of students who struggle to meet the requirements for academic writing (McKnight 2006 cited in Abdullah and Muhammad 2008) and this has given rise to concerns over plagiarism. McCullough and Holmberg (2005) found that 27 % of the master's theses they examined in their research indicated plagiarism of Internet sources. Aziz et al. (2012) also reported plagiarism among postgraduate students in local universities. According to Prof. Dr. Ramasamy, a political science lecturer, "plagiarism is the biggest offence in Malaysian universities" and it tarnishes the image of Malaysian universities (2009, n. p.). Plagiarism happens in Malaysian universities even though it is an academic dishonesty that is taken seriously and there are legal stipulations on it. This reflects that despite policies on plagiarism set by universities, there is still lack of exposure to rules and regulations on plagiarism.

57.1.1 Causes of Plagiarism

Plagiarism happens when students are unfamiliar with what plagiarism is. Maxwell et al. (2008) found an increase in plagiarism when there is a low level of understanding of plagiarism in both Australian and Asian students. In a local study by Yusuf and Masrom (2011), Malaysian students were also found to have "shallow understanding on plagiarism" (p. 5) as they indicated paraphrasing material from a source without citing it was acceptable. Similarly, Aziz et al. (2012) found plagiarism among postgraduate students who lacked awareness that it was wrong to use information from unpublished thesis without citing it. However, students cannot be blamed entirely for their misunderstanding of plagiarism as not much guidelines and information regarding plagiarism are provided by universities (Angelil-Carter 2000) and there is no agreement on how plagiarism is detected and addressed by the faculty (Ryan 2000).

Besides, there are several types of plagiarism which students might not be aware of and thus, they do not realize that they are plagiarizing in their academic writing. Walker (2010) outlines three categories of plagiarism: sham plagiarism, verbatim plagiarism and purloining. Sham refers to the act of taking sentences directly from sources and incorporating it in one own's writing with clear citations but leaving out quotation marks. Verbatim on the other hand is the act of incorporating direct copy of sentences but leaving out citations. Last, purloining is the act of using the whole writing of other students and submitting it as one's own. Other categories are patchwriting and illicit paraphrasing (Zafarghandi et al. 2012). Patchwriting refers to closely paraphrased work or making minor changes to source material and citation is either presented or not. Illicit plagiarism refers to taking material from a source and paraphrasing it but citation is omitted. Walker (2010) and Aziz et al. (2011) found sham plagiarism prevalent in their students' writing. Meanwhile, Vieyra et al.

(2013) detected mainly verbatim plagiarism among their respondents. Zafarghandi et al. (2012) found that illicit plagiarism followed by sham plagiarism was prevalent among their students.

Plagiarism also highlights that a major problem ESL postgraduate students face in doing their written assignment is the target language. Writing is a struggle for postgraduate students who have low proficiency, limited vocabulary and inadequate knowledge of grammar in the target language (Al-Zubaidi and Richards 2010; Mousavi and Kashefian-Naeeni 2011). Riasati and Rahimi (2013) found that postgraduate students with low English proficiency also had difficulties in understanding journals after repeated reading and plagiarised as an easy way out in completing their assignments. Meanwhile, Abasi and Akbari (2008) found that students who had anxieties in writing due to their low proficiency in English language resorted to patchwriting.

ESL postgraduate students who lack academic writing skills also commit plagiarism either intentionally or unintentionally. These skills which are quoting, paraphrasing, and summarizing (Bailey and Pieterick 2008) and avoidance of sentence redundancy are a challenge for students as many of them have existing problems in the target language. They also have problem in referencing sources as they either do not know how to do citations or are simply ignorant about it (Ting 2013; Ting et al. 2014). Breen and Maassen (2005, in Vieyra et al. 2013) found that although students were aware of plagiarism, their problems with paraphrasing and citing information led to plagiarism.

Another challenge faced by postgraduate students in academic writing is differences in educational practices. Differences in writing requirements and pedagogical practices cause difficulties for students to adapt to their current learning environment (Abasi and Akbari 2008). Carroll (2002) highlighted that change in assessment from examination for undergraduates to coursework or project-based assessments for postgraduates caused them constant pressure to maintain their good results. Assessments for postgraduates are often more critical and require more time for reading related journals and books to utilize the information in their work. Difficult and challenging individual tasks at postgraduate level (Riasati and Rahimi 2013), similar dates of submission for different assessments and poor time management (Williams 2005; Kakh and Wan Mansor 2012) also result in a tendency to plagiarize among postgraduate students because it is the quickest way to finish their work.

57.2 Bandura's Self-Efficacy Theory

Bandura's self-efficacy theory (1986) postulates the connection between human behavior and motivation in a person's self-belief. There are four primary sources: mastery experience, vicarious experience, verbal persuasion and psychological state of self-efficacy. Mastery experience refers to one's interpretation of the outcomes of past performances. Vicarious experience refers to observation of other's performance, verbal persuasion refers to how one anticipates positive and negative

appraisals and psychological state relates to psychological and affective arousal. Bandura (1995) highlights that “self-efficacy is the belief in one’s capabilities to organize and execute the course of actions required to manage prospective situation” (p. 2). He believes that self-efficacy influences how people make use of their knowledge and skills and their motivation which affect the completion of certain tasks. The results of these tasks depend on the level of one’s self-efficacy. If one holds a high level of self-efficacy, one will believe in one’s capabilities to overcome challenges in achieving one’s goals. This theory also views that self-efficacy is a “critical determinant of the self-regulatory practices in which individuals engage as they go about the important task of self-correcting their actions and cognitions” (Pajares 2009, n. p.). Past research have indicated that students performed poorly in their academic writing when they were insecure of their writing ability (Pajares and Valente 1997; Pajares 2003). Such low academic self-efficacy belief is a significant causality of misconduct among university students (Marsden et al. 2005 cited in Ogilvie and Stewart 2010).

57.3 Focus of the Study

This study aimed to contribute to research in plagiarism in academic writing in higher education in view of the following factors. First, more studies are needed to address the gap in empirical data in investigating the level of plagiarism in academic writing in higher learning institutions (Walker 2010). This is because literature on plagiarism indicates that research in this area leaned more to perceptions and not on what has been done by students themselves. Second, the limited studies on plagiarism in Malaysia involved international students in Malaysia instead of local students as respondents (Aziz et al. 2011; Kakh and Wan Mansor 2012). Thus, this study which used local TESL postgraduate students is hoped to address this gap and add to the existing knowledge of plagiarism among postgraduates in Malaysia. Hence, it aimed to look into the degree of plagiarism and to identify the types of plagiarism in TESL postgraduate students’ academic writing. In addition, this study aimed to recognize the types of sources which were plagiarized and factors contributing to plagiarism in TESL postgraduate students’ academic writing.

57.4 Methodology

The four participants (Students A, B, C and D) involved in this study were Master in Education in Teaching English as a Second Language (M.Ed TESL) postgraduate students from a public university in Selangor. The instruments were Chaps. 1 and 2 of the participants’ research proposal assignment, self-reflection reports and

interviews. The individual interview was conducted online. The written assignments were analyzed quantitatively. The analysis was facilitated by the plagiarism detection tool, Turnitin which gave a similarity index in percentage. Next, the similarities between the matched documents, i.e. the participants' writing and online text in Turnitin database were checked (links provided by Turnitin were used to locate the original source material) (Vieyra et al. 2013). After evaluating the documents, any similarity that was not indicated as plagiarism (i.e. legitimate quotations, references, etc.) was discarded (Walker 2010). The evaluation of plagiarism was done at sentence level in line with Vieyra et al.'s (2013) arguments that when a same source is used in a paragraph, certain sentences are copied while others are paraphrased, certain sentences are cited while others have citations omitted and some sentences are combined while others are isolated with information from different sources. The researcher and an experienced TESL teacher evaluated these matches to ensure reliability. The data from self-reflection reports and interview scripts were analysed qualitatively.

57.5 Findings and Discussion

57.5.1 Level of Plagiarism in TESL Postgraduate Students' Academic Writing

The Turnitin similarity index showed that the highest similarity index was 16 % for student A writing. Student C and D both had the same percentage of 15 %. The lowest similarity index, 11 % was found for student B writing. Next, based on the comparison made between the participants' writing text and original sources, the percentages for discarded sentences and actual plagiarized sentences were obtained. The discarded sentences in Student A writing was 3.3 % and plagiarized sentences was 12.7 %. Student B had the highest number of discarded sentences (4.2 %) and the lowest level of plagiarized sentences (6.8 %). This contradicted with Student C who had the lowest number of discarded sentences (0.3 %) and the highest plagiarized sentences (14.7 %). Meanwhile for Student D, discarded sentences were 2.1 % and 12.9 % of plagiarized sentences was detected in his writing. The findings show that there was some plagiarism in the postgraduate students' writing. The highest percentage of plagiarism was 12.9 % and the lowest was 6.8 %. The level of plagiarism in the participants' writing was below the level of 30 %, the permissible level of similarity by the institution that the postgraduate students' were enrolled in. It should be noted that such determinant of plagiarism varies for different institutions. Walker (2010) in his research on plagiarism among students in New Zealand higher institutions describes 20 % or less plagiarism in assignments as at a moderate level whereas if 20 % or more of an assignment was plagiarized, it was viewed as extensive.

57.5.2 Sources of Plagiarized Text

The participants plagiarized mainly from Internet sources (43 %), followed by student papers (23 %) and publications (20 %). For student A, 11 % of his writing was similar with Internet sources, 6 % was similar to publications and 7 % was similar to student papers. Next, for Student B, similarity to Internet sources was 9 %, followed by 4 % similarity with publications and 8 % similarity with student papers. Meanwhile, for student C, similarities with Internet sources, student papers and publications were 11 %, 8 % and 4 % respectively. Last, student D had the highest percentage for Internet sources (12 %), followed by student papers (10 %) and publications (6 %). The high rate of plagiarism from Internet sources occurred due to the easy accessibility of Internet to the participants. Walker (2010) believes that “the temptation to plagiarize is too hard to resist” (p. 18) due to the wider network and availability provided by a university and students’ engagement with IT. Studies on digital era (McCarthy and Rogerson 2009; Shafie and Nayan 2012) have concurred that plagiarism is likely to occur due to the easy access to the net by students. In the case of the postgraduate students in this study, they get wireless Internet in their university, faculty and library. Going back to Walker’s (2010) view that it is hard to resist plagiarism, a further explanation for the postgraduates’ plagiarism is that their level of self-efficacy may be negative, leading to poor self-regulatory behaviour as indicated by Bandura’s (1997) theory of self-efficacy. As for student papers, which is next highly plagiarized, this could also be due to its availability online. The participants may also find them easier to comprehend and in referring to them could have plagiarized them. With regard to publications, the lowest percentage of plagiarized source, this may be due to policies on access upon purchase of some publications particularly journal articles.

57.5.3 Types of Plagiarism in ESL Postgraduate Students’ Academic Writing

The main type of plagiarism found in the participants’ writing was sham plagiarism (17.2 %), followed by verbatim plagiarism (16.9 %), patchwriting (11.1 %) and illicit plagiarism (1.9 %). Examples of these types of plagiarism are as follows. Figure 57.1 shows an example of sham plagiarism by Student A who did not put quotation marks for the information copied directly from the source although the source was cited.

Figure 57.2 shows an account of verbatim plagiarism. Student A copied part of a text directly from a report by Lewis et al. (1999) in his work and failed to cite the source.

Figure 57.3 shows an example of patchwriting. Student A cut and pasted information from the original source (Hudson and Hudson 2006, p. 15) in his work. He partially paraphrased and partially copied from the source but quotation marks and reference were omitted.

Student A writing	Source: AllaBakshMohdAyub Khan in The Star Online (January 15, 2010)
AllaBakshMohdAyub Khan from UniversitiSains Malaysia in Star Online (2010) stated that <u>the ability of young Malaysian English teachers in teaching the English language as effectively as senior teachers has long been argued and debated.</u>	<u>The ability of young Malaysian English teachers in teaching the English language as effectively as senior teachers has long been argued and debated.</u>

Fig. 57.1 Example of sham plagiarism in Student A writing

Student A writing	Source: U.S. Department of Education, National Center for Education Statistics by Laurie Lewis, BasmatParsad, Nancy Carey, Nicole Bartfai, Elizabeth Farris and Becky Smerdon, 1999, p. 49
Evidently, beginning teachers are rarely fully prepared for real teaching. They are <u>less likely than more experienced teachers to report being very well prepared to maintain order and discipline in the classroom.</u>	Teachers with 3 or fewer years of teaching experience were <u>less likely than more experienced teachers to report being very well prepared to maintain order and discipline in the classroom.</u>

Fig. 57.2 Example of verbatim plagiarism in Student A writing

Student A writing	Source: Hudson and Hudson, 2006, p.15
The study reveals that <i>trainee teachers feel that there should be more time spent at schools and <u>with a more practical approach, allowing for better connection between theory and practice to provide a more meaningful learning for teachers in training.</u></i>	This study supports Ferry et al.'s (2004) research; that is, <i>pre-service teachers feel the need for more time in schools with a more practical approach, <u>allowing greater links between theory and practice to provide a more meaningful teacher education course</u></i> (p.15)

Fig. 57.3 Example of patchwriting in Student A writing

Student B writing	Source: El Fattah, 2010, p. 587
It consists of two types of motivation, which are entering motivation and task motivation. <u>Entering motivation evolves around establishing commitment and intention to act towards achieving the goals.</u>	Motivation includes entering motivation and task motivation. <u>Entering motivation establishes commitment to a particular goal and the intent to act.</u>

Fig. 57.4 Example of illicit plagiarism in Student B writing

Figure 57.4 shows an example of illicit paraphrasing. Student B paraphrased the material taken from El Fattah (2010, p. 587) as indicated by the italicised information in her work but she did not cite the information.

Going back to the findings, the main type of plagiarism detected in the participants' writing was sham plagiarism. The participants copied directly from sources

and failed to paraphrase although they provided citation. This finding concurs with Walker's (2010) and Aziz et al.'s (2011) findings that sham plagiarism is one of the highest rates of plagiarism among their respondents. The second type of plagiarism that was mostly detected was verbatim (16.9 %). All of the participants were found to do verbatim plagiarism by copying materials directly from sources and did not provide any citations similar to Walker's (2010) findings. The third type of plagiarism detected was patchwriting. Aziz et al. (2011) also found a high level of patchwriting in their respondents' writing who used it in adapting to the target language. This is parallel with conclusions made by Pecorari (2003) and Abasi and Akbari (2008) whereby patchwriting is viewed as an approach for students to be familiarized with the language used in academic discourse. Similarly, the participants in this study could have resorted to patchwriting as they had difficulties with language. The least type of plagiarism detected was illicit plagiarism. This could be a reflection of the postgraduate students' lack of paraphrasing skill and thus, lower occurrence of this type of plagiarism. It could also reflect lack of awareness of the proper conventions of academic writing as they omitted sources for paraphrased information.

57.5.4 Factors That Cause Plagiarism in TESL Postgraduate Students' Academic Writing

Based on the triangulation of data from self-reflection reports and interviews, the factors that caused plagiarism in the participants' writings were personal voice, time management, language proficiency and academic writing skills.

57.5.5 Personal Voice

The findings show that trying to achieve a sense of personal voice in their writing caused the participants to plagiarize. One of the participants, Student A worried about losing his "voice" in his writing. He stated, "It becomes a problem when deciding between using my 'voice' in the paper or merely collecting and paraphrasing others' quotes" (Interview with Student A). He added that he had problems in citing sources which he used as he was confused on the issue of "voice". Student A also stated that he viewed his writing as a compilation of others' work and not his. He struggled with this sense of confusion and loss and could have omitted citing source materials due to his predicament. According to Hyland (2002), representation of identity is also important in producing academic writing aside from presenting disciplinary content. Although it is important to present authorial voice in academic writing, it is a challenge for second language learners as they also need to integrate others' research in their writing. Besides, while coping with the complicated process of writing, a student's self-efficacy might be reduced due to his negative psychological state caused by confusion and loss. Students' past experiences on

writing i.e. mastery (Bandura 1977) can also affect their belief to integrate their own “voice” in their writing. Chances of plagiarism may be high in this situation as writers are coping with a complicated process.

57.5.6 Time Management

The participants also claimed that they had limited time in doing their proposal as they were also occupied with assignments for other subjects, This caused them to have difficulty in paraphrasing materials from sources. To illustrate, Student B noted, “... a lot of journals to be read, understood, synthesized and critically examined. At certain point, I found myself did not have time to paraphrase the important points, so I just directly quote from the author...” (Student B self-reflection report). Some of them omitted citations when they quoted. The participants in this study might have faced anxiety and stress in finishing their work due to limited time and similar deadlines. In line with Bandura’s self efficacy theory, these may have affected their psychological state whereby these emotions may lower their self-efficacy and motivation in writing in an appropriate manner. The findings here are supported by past research (Abasi and Akbari 2008; Williams 2005) that poor time management and similar date of submission or early deadlines cause students to plagiarize in their writing.

57.5.7 Language Proficiency

The participants had problems in analyzing journal article due to their language ability. They highlighted that some of the articles had to be read carefully and understood properly before they could incorporate pertinent information in their writing. Student A said “...most of the difficult-to-understand articles are written by the native speakers...” (Interview with Student A). It was also was a challenge for the participants to write using the targeted language and this caused plagiarism. For example, Student B used words from her sources because “... we don’t know the appropriate words that we should use in writing academically” (Interview with Student B). The findings showed that the participants found academic writing in the targeted language a challenge. This is similar with previous findings on lack of language proficiency that caused plagiarism among ESL students (Kakh and Wan Mansor 2012; Riasati and Rahimi 2013; Abasi and Akbari 2008; Aziz et al. 2011). These past research concur that plagiarism has become a choice for students due to their low level of language proficiency. This factor can be related with mastery, a source of self-efficacy in Bandura’s (1977) theory of self-efficacy. In this study, the participants’ poor language and writing might have lowered their level of mastery and self-efficacy. They could have questioned their capabilities of producing good writing in the targeted language which demotivated them and caused them to plagiarise.

57.5.8 *Academic Writing Skills*

The participants were also found to be lacking in academic writing skills. These skills included writing formally, paraphrasing, summarising, synthesizing, conveying ideas and referencing. Student B had problem in writing formally and academically. He stated, "I have a problem to write in objective manner and in formal way. But I do not mean to do it..." (Interview with Student B). Paraphrasing was also a difficult process for the participants especially when the source material contained "technical terms". Besides, Student C claimed that she had problems in summarising ideas. She said, "I feel that every word in the sentence is important and I want to include everything. I don't know what to leave out" (Interview with Student C). Another area of difficulty in writing was in conveying ideas obtained from source materials. To illustrate, Student D had problems in analyzing and using the information he sourced. He elaborated, "I have difficulty to analyze the articles critically... supporting my details using scholar's findings and claims..." (Interview with Student D). The participants also faced problems with referencing as seen with Student A who noted, "...it is difficult to differentiate information that needs to be cited and information that is not necessary to be cited..." (Interview with Student A). The findings support past findings on lack of writing skills such as quoting, paraphrasing and summarizing (Bailey and Pieterick 2008), and in-text referencing (Osman and Abu Bakar 2009; Giridharan and Robson 2011) among ESL postgraduate students. This reflects that lack of academic writing skills might be rooted since undergraduate years (Ting 2013; Ting et al. 2014) and persists at postgraduate level, leading to cases of plagiarism. This lack of mastery in writing can lead to poor self-efficacy and lack of motivation to self-regulate behaviour (Pajares 2009).

57.6 Conclusion

The findings of this study indicate some level of plagiarism in postgraduates' academic writing, Internet sources are mainly plagiarized, and sham followed by verbatim, patchwriting and illicit plagiarism occur. Challenges such as personal voice, time management, inadequate language skills and academic writing skills are found to cause plagiarism. These findings have implications on the importance of improving students' self-efficacy in academic writing by giving them support. The faculty should help postgraduate students to be aware of the different types of plagiarism and to have a better understanding on what constitutes plagiarism and how to avoid it in their writing. Postgraduate students should also be given guidance in academic writing skills to motivate them to master skills in writing and become more persistent in producing writing that meets the requirements needed in their academic community. Pajares (2009) notes that mastery leads to positive self-efficacy and academic self-efficacy which influences cognitive strategy use and self-regulation through the use of meta-cognitive strategies..." (n.p.). In line with this, with the

support given by the faculty, students' sense of positive self-efficacy can be nurtured to prevent misconduct, i.e. plagiarism in their writing.

References

- Abasi, A. R., & Akbari, N. (2008). Are we encouraging patchwriting? Reconsidering the role of the pedagogical context in ESL student writers' transgressive intertextuality. *Journal of English for Specific Purposes*, 27, 267–284.
- Abdullah, N. A., & Muhammad, A. M. (2008). *Are we there yet? ESL postgraduates writing in an English medium*. Shah Alam: Academy of Language Studies, Universiti Teknologi Mara. Retrieved from http://api.ning.com/files/X5tEBcXJEAsn5r4V7-3CNT4n0Qz-5OBNfsgijXWwbD6Rzw*9-GYK0qPuQ0eD6QPm0ahlbJtCpEV6z3r0hR-N1V3VG5g0haav/AbdullahandMuhammed_Arewethereyet.pdf
- Al-Zubaidi, K., & Richards, C. (2010). Arab postgraduate students in Malaysia: Identifying and overcoming the cultural and language barriers. *Arab World English Journal*, 1(1), 107–129.
- Ange'lil-Carter, S. (2000). *Stolen language?: Plagiarism in writing*. New York: Longman.
- Arkoudis, S., & Tran, L. (2010). Writing blah, blah, blah: Lecturers' approaches and challenges in supporting international students. *International Journal of Teaching and Learning in Higher Education*, 22, 169–178.
- Aziz, J., Hashim, F., & Razak, N. A. (2011). Students' strategies and patterns of plagiarism: Academic writing in the Internet age. *Research Journal of Applied Sciences*, 6, 391–397. Retrieved from <http://docsdrive.com/pdfs/medwelljournals/rjasci/2011/391-397.pdf>
- Aziz, J., Hashim, F., & Razak, N. A. (2012). Anecdotes of plagiarism: Some pedagogical issues and considerations. *Asian Social Science*, 8(10), 29–34.
- Bailey, C., & Pieterick, J. (2008). Finding a new voice: Challenges facing international (and home!) students writing university assignments in the UK. Retrieved from http://wlv.openrepository.com/wlv/bitstream/2436/98516/1/cb-jp_final_edit.pdf
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs: Prentice-Hall.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs: Prentice-Hall.
- Bandura, A. (1995). *Self-efficacy in changing societies*. Cambridge: Cambridge University Press.
- Bandura, A. (1997). *Self-efficacy: The exercise control*. New York: W. H. Freeman.
- Carroll, J. (2002). *A handbook for deterring plagiarism in higher education*. Oxford: Oxford Centre for Staff and Learning Development.
- Giridharan, B., & Robson, A. (2011). *Identifying gaps in academic writing of ESL students*. Retrieved from <http://www.curtin.edu.my/tl2011/download/papers/refereed/Identifying%20gaps%20in%20academic%20writing%20of%20ESL%20students.pdf>
- Hyland, K. (2002). Authority and invisibility: Authorial identity in academic writing. *Journal of Pragmatics*, 34, 1091–1112.
- Kakh, S. Y., & Wan Mansor, W. F. A. (2012). The factors that result in unintentional plagiarism in postgraduate non-native students' written productions. In *Proceeding of the 7th Malaysia international conference on languages, literatures and cultures*. Universiti Putra Malaysia. Retrieved from www.fbk.upm.edu.my/micollac/proceedings
- Lee, Nancy Shzh-chen, & Tajino, A. (2008). Understanding students' perceptions of difficulty with academic writing for teacher development: A case study of the university of Tokyo writing program. Retrieved from http://www.highedu.kyoto-u.ac.jp/publication/data/kiyou14/01_nancy.pdf
- Maxwell, A., Curtis, G. J., & Vardanega, L. (2008). Does culture influence understanding and perceived seriousness of plagiarism. *International Journal for Educational Integrity*, 4(2), 25–40.

- McCarthy, G., & Rogerson, A. M. (2009). Links are not enough: Using originality reports to improve academic standards, compliance and learning outcomes among postgraduate students. *International Journal Education Integrity*, 5(2), 47–57. Retrieved from <http://ro.uow.edu.au/gsbpapers/28>
- McCullough, M., & Holmberg, M. (2005). Using the Google search engine to detect word-for-word plagiarism in master's theses: A preliminary study. *College Student Journal*, 39, 435–441.
- Mousavi, H. S., & Kashefian-Naeeni, S. (2011). Academic writing problems of Iranian postgraduate students at National University of Malaysia (UKM). *European Journal of Social Sciences*, 23(4). Retrieved from http://www.eurojournals.com/EJSS_23_4_08.pdf
- Ogilvie, J., & Stewart, A. (2010). The integration of rational choice and self-efficacy theories: A situational analysis of student misconduct. *The Australian and New Zealand Journal of Criminology*, 1, 1–26.
- Osman, W. H., & Abu Bakar, A. L. (2009). Learning to write an academic paper among medical students of university Malaysia Sabah. In *Proceedings of the 2nd International Conference of Teaching and Learning (ICTL 2009) INTI University College, Malaysia*, 2, 1–21.
- Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading & Writing Quarterly*, 19, 139–158.
- Pajares, F. (2009). Self-efficacy theory. Retrieved from <http://www.education.com/reference/article/self-efficacy-theory/>
- Pajares, F., & Valiante, G. (1997). Influence of writing self-efficacy beliefs on the writing performance of upper elementary students. *Journal of Educational Research*, 90, 353–360.
- Pecorari, D. (2003). Good and original: Plagiarism and patchwriting in academic second language writing. *Journal of Second Language Writing*, 12(4), 317–345. doi:10.1016/j.jslw.2003.08.004.
- Pecorari, D. (2006). Visible and occluded citation features in postgraduate second-language writing. *English for Specific Purposes*, 25(1), 4–29.
- Ramasamy, P. (2009, September 17). Plagiarism most endemic academic fraud. *The Sun Daily*. Retrieved from <http://www.thesundaily.my/node/151219>
- Riasati, M. J., & Rahimi, F. (2013). Why do Iranian postgraduate students plagiarize? A qualitative investigation. *Middle East Journal of Scientific Research*, 14(3), 309–317.
- Ryan, J. (2000). *A guide to teaching international students*. Oxford: Oxford Centre for Staff Development, Oxford Brookes University.
- Shafie, L. A., & Nayan, S. (2012). The net generation and academic dishonesty in Malaysia. *Technology Innovations in Education*, 181–186. Retrieved from <http://www.wseas.us/e-library/conferences/2012/Porto/EDUTE/EDUTE-28.pdf>
- Ting, S.-H. (2013). Academic writing: Citation is troublesome and plagiarism is no big deal. *Proceeding of the International Conference on Social Science Research*, 1533–1542. Retrieved from <http://worldconferences.net/proceedings/icssr2013/toc/382%20-%20Su-Hie%20-%20ACADEMIC%20WRITING%20CITATION%20IS%2>
- Ting, S.-H., Musa, M. K., & Mah, F. S.-F. (2014). Plagiarism norms and practices in coursework assignments. *International Journal of Education*, 6(1), 73–89.
- Vieyra, M., Strickland, D., & Timmerman, B. (2013). Patterns in plagiarism and patchwriting in science and engineering graduate students' research proposal. *International Journal for Educational Integrity*, 9(1), 35–49.
- Walker, J. (2010). Measuring plagiarism: Researching what students do, not what they say they do. *Studies in Higher Education*, 35(1), 41–59.
- Williams, J. B. (2005). Plagiarism: Deterrence, prevention and detection. In *The handbook for economics lecturers* (pp. 1–20). Retrieved from <http://www.economicnetwork.ac.uk/handbook/printable/plagiarism.pdf>
- Yusof, D. S., & Masrom, U. K. (2011). Malaysian students' understanding of plagiarism. *The International Journal – Language Society and Culture*, 33, 1–7.
- Zafarghandi, A. M., Khoshroo, F., & Barkat, B. (2012). An investigation of Iranian Masters students' perceptions of plagiarism. *International Journal for Educational Integrity*, 8(2), 69–85.

Chapter 58

“To Cheat or Not To Cheat, That is the Question”: Undergraduates’ Moral Reasoning and Academic Dishonesty

Parmjit Singh and Roslind Thambusamy

Abstract While academic qualifications are important in securing jobs, it is inarguable that ethics and integrity are also crucial in the workplace. These concerns are serious and disconcerting given the reports of rampant academic dishonesty within higher education institutions (HEIs). For graduates who think that cheating is acceptable, concepts like ‘morality’, ‘virtue’, and ‘truth’ are subsumed under the imperative of getting the grade. Studies show that there is a significant relationship between academic cheating and students’ potential unethical behavior in the workplace, which is a troubling indicator in terms of overall human resource and national development. This study addresses the issue of undergraduates’ moral reasoning by focusing on their perceptions’ of academic dishonesty and what drives them to cheat. This study employed a descriptive research design method using a self-report questionnaire to collect data from 288 (72 males and 216 females) randomly selected undergraduate students from different programs of study in a Malaysian HEI. The findings reveal that almost two-thirds (59.8 %) of the respondents felt that academic dishonesty is rampant. Interestingly though, while close to 90 % responded positively when asked “are you *sure* another student cheated during a quiz/exam?”, almost 80 % indicated they would *not* report such acts of dishonesty. Reasons for this phenomenon is a telling indicator of the undergraduates’ moral reasoning and it is one that HEIs should attempt to re-orientate by way of curricular and pedagogical strategies in order to advocate the culture of academic integrity and by default, professional ethics.

Keywords Academic dishonesty • Undergraduates • Moral reasoning • Integrity • Ethics

P. Singh • R. Thambusamy (✉)
Faculty of Education, University Technology MARA, 40200 Shah Alam, Malaysia
e-mail: parmj378@salam.uitm.edu.my; rxt56@live.com

58.1 Introduction

A recent study has revealed that, apart from the usual soft skills such as communication and teamwork that top the list of skills valued by employers, integrity and professional ethics has also found its way into the list of skills valued by employers (Parmjit et al. 2014). In fact, the findings of this study revealed that for employers of multinational organizations, ethics topped the list of soft skills required in any future employee. This is a significant indicator that this aspect of human capital development needs to be acknowledged and addressed. While HEIs emphasise academic qualifications, it seems that ethics (or the lack thereof) has become a value that employers are becoming increasingly concerned about. Hence, it is only appropriate that HEIs take note of this trend and undertake the necessary steps to ensure that they produce graduates with the right values. There is a dire need for HEIs to focus on the ethical development of their graduates given the increasing reports of academic dishonesty. Adesile and Oseni (2011) in a study of academic dishonesty among tertiary level students cited a host of studies done on academic dishonesty with disturbing findings. They cite “multi-institutional studies [which] showed that respondents between the range of 39 to 70 % acknowledged involvement in academic dishonesty during their college years (Bowers 1964; McCabe 1992, 1993; Pino and Smith 2003; Aluede et al. 2005 cited in Adesile and Oseni 2011)” (p. 2). According to the sources cited in their study, academic dishonesty “occurs at epidemic proportions (Hutton 2002; McCabe 1993; Niels 1996)” (p. 2). Even more disconcerting is that in a “thirty years follow up study on student cheating, Wotring (2007) remarked that the population of student cheaters increased from 63 % to 70 %.” (p. 2). The massive scale in which this practice occurs is astounding given the “survey studies [which] reported that almost one-third of the 6,000 students from 31 colleges and universities had indulged in cheating (McCabe 1999); more than 30 % plagiarized on all their papers (Bloomfield 2005); and 117 fresh students used emails to exchange answers in an examination” (Wilson 1999) (p. 3). While such a revelation is shocking enough in terms of the apparent lack of ethics among university students, even more unsettling are studies (Jones 2011; Etter et al. 2004; Nonis and Swift 2001) that show a significant relationship between academic cheating and students’ potential unethical behavior in the workplace. The link between unethical behavior in the university and the potential workplace, however tenuous, should not be taken lightly as it is a potent indicator of the failure of the HE system to produce ethically-sound human capital, particularly in the current capitalist-driven socio-economic system that underpins global development, where a country’s socio-economic development is measured in materialistic terms as in high or low income. This emphasis on purely monetary gains does not bode well for ethical decision making and this is confirmed by Adesile and Oseni (2011) who mention that “studies have reported a significant relationship between the level of college cheating and a country’s corruption index (Magnus et al. 2002)” (p. 9). As producers of human capital that will impact on national development, Liddell and Cooper (2012) cite Whiteley (2002) who posited “that “one of the fundamental obligations

of the modern college and university is to influence intentionally the moral thinking and action of the next generation of society’s leaders and citizens” while “Chickering (2010) refers to higher education as the most compelling institutional source for upholding our democracy, although he warns that we have fallen far short of creating college graduates “who can function at the levels of cognitive, moral, intellectual, and ethical development that our complex national and global problems require.” (p. 5–6). This line of thinking underscores the general belief that educational institutions of all levels are directly responsible for the moral and ethical development of young people as they pass through these institutions.

In the current HE scenario, academic dishonesty comprises many different acts of cheating ranging from plagiarism, cheating on tests, quizzes and examinations as well as cheating on coursework such as collaborating with friends to complete individual assignments, copying other students’ assignments, doing other students’ work for them, not contributing in a group project, and paying someone to do their coursework (McCabe et al. 2001; McCabe 2005).

While many reasons have been offered for dishonest behaviours in HEIs, both internal and external factors such as peer influence, assessment modes, personal beliefs, and socio-cultural mores make up the possible reasons why students engage in academic dishonesty. According to Adesile and Oseni (2011), “literature showed that individual actions could be shaped by larger forces which transcend internal, organizational, and institutional boundaries (Bertram 2008). Students’ behaviors, thoughts and actions are products of many factors (McCabe 2001; Nadelson 2007). Variables such as cognitive development and environmental influences play an important role (Bandura 1977 cited in Nadelson 2007)” (p. 3). Devlin and Gray (2007), on the other hand, argued that different cultures that might affect the prevalence of cheating particularly plagiarism. They argued that second language learners face difficulty in paraphrasing English text which may tacitly lead to dishonest behaviours. An Australian study by Lynnette and James (2001) reported a high number of international students who admitted engaging in academically dishonest behaviours as compared to Australian students. This implies that non-native speakers of English are more prone to committing academically dishonest behaviours under particular circumstances. While there may be a myriad reasons for the occurrence of academic dishonesty, it is not the intention of this study to compare the prevalence of cheating between different regions, among different types of students or even the degrees of dishonesty. The question that has prompted this study is not so much that dishonesty occurs or in what form as the many studies cited can attest to these occurrences. The question here is when students are faced with the temptation to cheat, to what extent does their moral reasoning control or influence their decision to cheat or not to cheat? This is basically the question; whether to obey the academic rules or to succumb to the temptation to cheat. It was felt that this study would be able to probe the students’ perceptions regarding the question of ‘to cheat or not to cheat’ and why, particularly in the Malaysian context, where few studies of this phenomena have been conducted (Smith et al. 2007; Che Ku Hisam 2008). It is hoped that this study will provide significant insights exclusively towards Malaysian undergraduates’ moral reasoning with regards to indulging in academically dishonest

est behaviors. Additionally, the study also attempts to reveal the extent of dishonest behaviour among these undergraduates. This study concurs with researchers who have highlighted “that how students think and what affects their decisions to act dishonestly, are all important factors which when understood,” could curb academic dishonesty (McCabe et al. 2008 cited in Adesile and Oseni 2011, p. 9).

According to Liddell and Cooper (2012) “ethics refers to a set of moral principles used by an individual or group that provides a framework for behavior. For instance, professional associations expect ethical behavior of their members and set the parameters for that behavior in their ethical guidelines” (p. 14). While ethics and morals stem from a similar paradigm, the term ethics is most widely used in the professional context while the term morals is more often used in the educational or spiritual context. Hence, we have moral education in schools but business or medical or legal ethics taught in universities. However, for the purpose of this paper, the term moral reasoning by Kohlberg has been adopted to signify a process of “moral development, which is an aspect of cognitive development [where] as a person is able to make sense of the world in more complex ways, the ability to weigh moral actions also moves to more sophisticated decision-making approaches” (Liddell and Cooper 2012, p. 15). This explanation is more aligned to the learning processes of undergraduates at the tertiary level. Liddell and Cooper (2012) provide a succinct elaboration of the conceptual underpinnings of moral reasoning which “is grounded in the work of cognitive-structural theorists, such as Jean Piaget and William Perry. Cognitive-structural theories assume that development happens in stage sequencing that is invariant, hierarchical, and qualitatively unique from other stages (as opposed to additive). Using cognitive structures helps us to organize and adapt to our environments. Additionally, understanding moral growth from a cognitive-structural developmental framework leads us to expect that learners (in our case, college students) are using cognitive structures to make meaning and reason through problems as they become more intellectually complex and competent (McEwen 2003)” (p. 9).

58.2 Objectives

The purpose of the study is to investigate the perceptions towards and extent of academic dishonesty among undergraduates at a leading Malaysian HEI. Specifically, the study aims to achieve the following main objectives:

- (a) To determine the extent of academic dishonesty behaviors among undergraduates.
- (b) To determine the moral reasoning that drives undergraduates to engage in academically dishonest behaviours.

The findings of this study will contribute to previously unavailable empirical evidence, especially in Malaysian context, on the extent of academic dishonesty and the moral reasoning that influences undergraduates to cheat or not to cheat. This will

enlighten educators on the extent of academic dishonesty that exists as well as what prompts students to indulge in such behaviour. This will hopefully enable academics to develop effective strategies to address academic dishonesty and work out policies that can help achieve academic integrity by focusing on the reasoning that drives students to cheat.

58.3 Methodology

The study employed a descriptive design that examines the responses of a large group of undergraduates towards the issue of academic dishonesty by analysing their perceptions of this issue. A self-administered survey questionnaire highlighting the pertinent issues related to academic dishonesty was used to gather the data. Recognizing that the issue of academic dishonesty is a sensitive one involving one’s morals and behaviour, it was felt that self-administered survey questionnaires would be the ideal instrument to gather data as it would ensure that the respondents felt secure in providing their honest responses confident that they would remain anonymous (Fraenkel and Wallen 2008). Specifically, the main objectives of the questionnaire used in this study were to unveil the following issues: (a) The extent of academically dishonest behaviors among students, and (b) The reasons for engaging in academic dishonesty behaviors which would reveal the moral reasoning behind the need to cheat.

The sample was selected on a purposive basis in order to cover the range of programmes offered at a particular faculty in the target HEI. The sample was given the instrument in one sitting to ensure a 100 % return rate and allowed sufficient time to respond to the items.

58.4 Findings and Discussion

This section details the findings and elaborates on the statistical analysis based on the formulated research questions. This study involved a total of 288 undergraduates comprising 72 (25 %) male students and 216 (75 %) female students (refer to Table 58.1).

In wanting to uncover the extent of academic cheating from the students’ perspective, the following question was asked.

Table 58.1 Students’ demographic profile (N=288)

Variables	Frequency	Percent
Gender		
Male	72	25.0
Female	216	75.0

A. *How frequently do you think your friends cheated during a quiz/exam?*

When respondents (refer to Table 58.2) were asked, “Have you *suspected* another student of cheating during a quiz/exam?” and “Were you *sure* another student cheated during a quiz/exam?”, a staggering 93.4 % and 86.4 % respectively indicated that cheating in quizzes and exams occurred. While suspecting or even being certain that others cheated in quizzes/exams may be considered a fairly straightforward response, in order to probe deeper into the students’ moral reasoning about academic dishonesty, the following question was asked (Table 58.3).

B. *Do students report acts of academic dishonesty committed by other students?*

In a shocking revelation, while almost all the respondents acknowledged that many students did cheat as indicated in Table 58.2, 93.8 % responded that they would NOT report acts of academic dishonesty (Table 58.3). The findings reported in Table 58.4 further exacerbates the situation by showing the likeliness of students to report incidences of academic dishonesty. When asked how likely is that “you would report an incident of cheating that you observed?”, “The typical student at your university would report such violations?” and “A student would report a close friend?”, the majority of the responses fell into the unlikely

Table 58.2 The extent of cheating by other students

	In the past year, how often, if ever,	Never	Once	A few times	Several times	Many times
1.	Have you <i>suspected</i> another student of cheating during a quiz/exam?	6.6 % (19)			57.0 % (163)	36.4 % (104)
2.	Were you <i>sure</i> another student cheated during a quiz/exam?	8.0 % (23)	5.6 % (16)		53.5 % (153)	32.9 % (94)

Table 58.3 Reported another student for cheating

		Yes	No
1.	Have you ever reported another student for cheating?	6.2 % (17)	93.8 % (258)

Table 58.4 Reporting incidences of academic dishonesty

No.		Very unlikely	Unlikely	Likely	Very likely
	How likely is that:	Very unlikely	Unlikely	Likely	Very likely
1.	You would report an incident of cheating that you observed	–	83.3 % (240)	16.7 % (48)	–
2.	The typical student at your university would report such violations	–	76.0 % (218)	24.0 % (69)	–
3.	A student would report a close friend	–	80.5 % (231)	19.5 % (56)	–

category with a high percentages of 83.3 %, 76.0 % and 80.5 % respectively. Again, these findings are indicative of the students’ moral reasoning that although incidences of academic dishonesty are rife, they are unlikely to report these incidences to the authorities.

In order to capture the integral issues that drive the students’ moral reasoning in the matter of academic dishonesty, several pertinent items were included under the following broad headings.

C. *What are the reasons for engaging in academically dishonest behaviors as perceived by students?*

Table 58.5 below displays the responses given by students as to why they engaged in academic dishonesty as well why they would not report their friends for cheating. As discussed earlier, the reasons why students cheat are numerous but for the purpose of this study, these are broadly categorised into four dimensions namely Peers’ Behaviors, Academic Achievement and Assessment, Personal Beliefs and Other Related Reasons.

Table 58.5 Students’ reasoning regarding academic dishonesty

No	Categories of reasons driving academic dishonesty	Yes	No	Rank
A	Peers’ behaviors			
1.	I wanted to help a friend	81.9 %	18.1 %	1
12.	I thought if I helped someone else, they might help me	64.7 %	35.3 %	8
13.	Other students do it (or urged me to do it)	56.4 %	43.6 %	11
B	Academic achievement and assessment			
2.	The assessment was too difficult	79.4 %	20.6 %	3
3.	The assessment was too time-consuming	77.1 %	22.9 %	4
7.	The due date was too soon	66.1 %	33.9 %	7
8.	The due date coincided with other assessments’ due dates	72.8 %	27.2 %	5
14.	The content of the assessment did not interest me	48.6 %	51.4 %	12
17.	I thought the assessment was unfair.	42.5 %	57.5 %	17
C	Personal beliefs			
9.	I was under pressure to get good grades	67.9 %	32.1 %	6
11.	I had a personal crisis	35.8 %	64.2 %	18
6.	I didn’t think it was wrong	29.8 %	70.2 %	19
4.	I was not likely to be caught	59.3 %	40.7 %	9
10.	The lecturer hadn’t taught me well enough	48.6 %	51.4 %	12
15.	It was easy – the temptation was too great	42.7 %	57.3 %	16
16.	I hadn’t heard of other students being penalized before	43.4 %	56.6 %	15
D	Other related reasons			
5.	It was unintentional	58.9 %	41.1 %	10
20.	Cheating is a victimless crime – it doesn’t harm anyone	45.5 %	54.5 %	14
18.	It was easy to copy during the quiz	81.4 %	18.6 %	2
19.	It was easy to copy during the exam	21.3 %	78.7 %	20

58.4.1 Peers' Behaviors

In Section A in Table 58.5, the majority of the students (81.9 %) responded that they “wanted to help a friend” followed by almost two-thirds (64.7 %) responding that “I thought if I helped someone else, they might help me.” More than half (56.4 %) stated that “Other students do it (or urged me to do it)”. This clearly shows the influence of cultural conditioning where the community identity (in this case student community) is valued over ethical behaviour. This means that these students are willing to engage in academically dishonest behaviors willingly just to maintain the status quo. The need to preserve and conform to a community identity is deeply entrenched in Asian culture, where community well-being and status quo is prioritised over individual or even ethical concerns. In terms of not reporting incidences of dishonest behaviour, this means that, while not directly engaging in dishonest behaviours, these students nevertheless, are willing to turn a blind eye to such occurrences, hence becoming willing partners in crime. Apparently, the need to conform outweighs all other considerations, which is a clear indicator of the moral reasoning of the students when confronted with the temptation to cheat. This finding is corroborated by McCabe et al. (2001) who found that peer pressure is significantly related to student cheating and also by Wilkinson (2009) who also mentions students' lifestyle and relationship with others as a significant factor that contributes to the prevalence of cheating. This concern, although already mentioned earlier, needs to be reiterated due to its significant impact on the students' moral reasoning even to the extent that they would willingly cheat to please their friends.

58.4.2 Academic Achievement and Assessment

Section B relates to students' perceptions of the assessments and achievement and how these impact on their reasoning to cheat or not to cheat. In this category, the difficulty level of the assessment was blamed by the majority of the respondents (79.4 %) with “The assessment was too difficult”. Almost the same number (77.1 %) claimed that “The assessment was too time-consuming”. About half the respondents felt that “The content of the assessment was not of interest to me,” (51.4 %) and “I thought the assessment was unfair” (57.5 %) which contributed to their urge to cheat. The need to assess is a natural consequence of teaching and learning but the mode and frequency of assessments has always been a matter of contention in educational circles. This finding reveals that, for students, the modality and frequency of assessment is indeed a significant contributor to the students' need to cheat.

58.4.3 Personal Beliefs

Section C deals with personal beliefs where the “pressure to get good grades” was selected by more than two-thirds of the respondents (67.9 %). Slightly more than half (59.3 %) reasoned that they were “not likely to be caught” while less than half

(43.4 %) reasoned that not having “heard of other students being penalized before” condoned cheating. “I had a personal crisis” was also a strong reason with 64.2 % of the respondents opting for this item. Paula (2004) lists among the intentional acts of cheating (1) an individual’s extreme need to succeed, (2) fear of failing or missing out an opportunity, and (3) a lack of time, interest, or the abilities needed to complete the assignment properly. Congruent to this, the respondents in this study were pressured to engage in academically dishonest behaviors in order to survive.

In spite of all this evidence pointing to the ambiguity of the students’ moral reasoning, surprisingly, more than two-thirds (70.2 %) did recognize that cheating was wrong by disagreeing to the item “I didn’t think it was wrong”. Thus, in terms of moral maturity, the students do know the difference between right and wrong but choose to still cheat due to the various reasons as observed in their responses.

58.4.4 Other Related Reasons

In Section D, the majority of the respondents (81.4 %) agreed that “It was easy to copy during the quiz”. Cheating during exams, on the other hand, was shown to be more difficult with close to three-quarters (78.7 %) disagreeing that “It was easy to copy during the exam.” Lecturers should take note of this to implement stricter measures to prevent cheating during quizzes. Like exams, harsher penalties could be imposed for cheating even during quizzes to prevent such behaviour. In Malaysian HEIs, quizzes are generally conducted in the classroom environment, whereas, examinations are usually held in a large hall and supervised vigilantly by several examiners. Additionally, unlike quizzes, the punishment for cheating is always emphasized prior to the examination. This indirectly heightens the students’ awareness of the penalties for cheating during exams, hence verifying the finding where the majority of the students find that it is not easy to cheat during exams. Hence, the policies on cheating during quizzes should be tightened and enforced more vigilantly. What is sad and telling in terms of the ambiguity of the students’ moral reasoning is that they were divided (45.5 % – Yes and 54.5 % – No) in their response to the item “Cheating is a victimless crime – it doesn’t harm anyone” meaning that almost half of them think that cheating actually does not harm anyone.

In order to identify the main reasons that underpin the students’ moral reasoning with regard to the issue of academic dishonesty, the top ten reasons selected by the respondents were gleaned.

1. I wanted to help a friend. (peers’ behaviour)
2. It was easy to copy during the quiz (other related reasons)
3. The assessment was too difficult. (assessment and achievement)
4. The assessment was too time-consuming. (assessment and achievement)
5. The due date coincided with other assessments’ due dates. (assessment and achievement)
6. I was under pressure to get good grades. (personal beliefs)
7. The due date was too soon. (assessment and achievement)
8. I thought if I helped someone else, they might help me. (peers’ behaviour)

9. I was not likely to be caught. (personal beliefs)
10. It was unintentional. (other related reasons)

It is interesting to note that, when faced with the temptation to cheat, students' moral reasoning is mostly affected by considerations of assessment and achievement which is not difficult to understand as students would naturally prioritise their academic performance above any other consideration. While the respondents did place the issue of maintaining friendships as the top reason for students to cheat, overall, it occupied less of students' reasoning as compared to assessment and achievement. The other reasons like personal beliefs and other related reasons were also deemed not as important as assessment and achievement.

58.5 Conclusion

This study attempted to uncover the motives of students indulging in academic dishonesty by unravelling the forces that drive their moral reasoning. The evidence above reveals clearly the factors that drive the moral reasoning of the students and the resultant stance towards academic dishonesty. The evidence was gleaned from four categories comprising (1) Peers' Behavior, (2) Academic Achievement and Assessment, (3) Personal Beliefs, and (4) Other Reasons related to Cheating. It is clear that students, driven by the need to perform well academically, are willing to stoop to dishonest acts to ensure that their assessments and achievement are intact. This evidence highlights the need for institutions to create open and honest discussions about the problems and conflicts with regard to the issue of academic dishonesty and formulate policies regarding academic dishonesty that embrace all forms of assessment, not just the final examinations. The idea that students find it easy to cheat in quizzes reflects negatively on lecturers and on the assessment procedures. To prevent such practices, a standardised procedure for quizzes should be instituted and maintained by all lecturers regardless of the subject taught. Penalties for cheating on quizzes should be as strict as those imposed for exams. All quizzes should be as strictly proctored as in the exams. Another reason why students feel that it is easier to copy during quizzes could be due to the quality of the teaching and testing itself, where students' thinking is neither challenged nor stretched due to the low-order thinking promoted by the lecture notes and test items used. To combat this, the quality of teaching and testing should improve requiring higher-order, critical thinking which would not allow copying. This would also apply to assignments as it would prevent plagiarism, a common ailment afflicting HEIs. All this would require lecturers to be more dedicated and focused on teaching creatively and creating assessments that actually test their students' knowledge and skills rather than recycle, ad nauseum, power points of lecture notes, questions from past year papers or the same quiz questions year after year that actually facilitate copying rather than prevent it. Wilkinson (2009) and relevant research on testing can enlighten lecturers on the proper features in constructing assessments that prevent cheating among

students. Furthermore, as “one of the fundamental obligations of the modern college and university is to influence intentionally the moral thinking and action of the next generation of society’s leaders and citizens” (Whitley 2002 cited in Liddell and Cooper 2012, pp. 5–6), HEIs need to move beyond the provision of merely occupational expertise and uplift the HE experience to one that embraces wholesome and holistic learning, which includes humanities subjects like literature, music, and theatre, which by their very nature, are dedicated to the instilling of moral as well as human values that go beyond the acquisition of material wealth. These subjects could be made compulsory but not examinable, so as not to overload the students with more assessments but as avenues for them to construct their own value system by exploring and expounding on the values presented in the literary and dramatic texts. Unfortunately, at the HE level, these crucial value-added subjects are omitted from all STEM courses in favor of more occupational fare. Research has indicated that we need human capital “who can function at the levels of cognitive, moral, intellectual, and ethical development that our complex national and global problems require.” (Chikering 2010 cited in Liddell and Cooper 2012, pp. 5–6). This is a tall order and can only be attained by relooking the intellectual fare being dished out at our HEIs under the guise of human capital development.

Fischer and Zigmond (2011) further suggest that institutions and educators must understand their students and the potential reasons for students to engage in academic dishonesty and actualise this understanding into policies and pedagogies that eventually model academic integrity which would be absorbed into students’ moral and cognitive development. The idea of engaging students in an open and honest discussion about this serious issue is perhaps an alien concept in Malaysian culture, where the young are generally not asked for their opinions especially in important matters. However, this culture needs to change as academic dishonesty is a disease, one that afflicts the moral health of the individual and, by default, the nation. Research has already shown that academic dishonesty is but the first step to a more insidious destruction of the moral fiber of the nation. No amount of material wealth can smother the stench of moral decay for as Theodore Roosevelt rightly claimed “To educate a person in mind and not in morals is to educate a menace to society”. How many in our HEIs, students and academics alike, would agree with Sophocles who said, “I would prefer to fail with honor than to win by cheating”?

References

- Adesile, M. I., & Oseni, R. A. (2011). Academic dishonesty among Tertiary Institution students: An exploration of the societal influences using SEM analysis. *International Journal of Education*, 3(2), 1–15. Retrieved on April 12, 2014, from www.macrothink.org/ijie
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs: Prentice Hall.
- Che Ku Hisam. (2008). Tracking the academic dishonesty at the Malaysian higher education. [Online Article]. Retrieved December 1, 2012, from <http://www1.tganu.uitm.edu.my/upena/dokumen/AcadmeicDishonesty.doc>

- Devlin, M., & Gray, K. (2007). In their own words: A qualitative study of the reasons Australian university students plagiarize. *Higher Education Research & Development*, 26(2), 181–198.
- Etter, B. K., Harding, T. S., Finelli, C. J., & Carpenter, D. D. (2004, October 20–23). *The role of moral philosophy in promoting academic integrity among engineering students*. A paper presented at the 34th ASEE/IEEE Frontiers in Education Conference.
- Fischer, B. A., & Zigmond, M. J. (2011). Educational approaches for discouraging plagiarism. *Urologic Oncology: Seminars and Original Investigations*, 29, 100–103. Elsevier.
- Fraenkel, J. R., & Wallen, N. E. (2008). *How to design and evaluation research in education* (7th ed.). New York: McGraw Hill.
- Jones, D. L. R. (2011). Academic dishonesty: Are more students cheating? *Business Communication Quarterly*, 74(2), 141–150. Retrieved on April 21, 2014, from <http://debdavis.pbworks.com/>
- Liddell, D. L., & Cooper D. L. (2012). Moral development in higher education. *New Directions for Student Services*, no. 139, Fall 2012 © Wiley Periodicals, Inc. Published online in Wiley Online Library. Retrieved on November 12, 2014, from wileyonlinelibrary.com. doi:10.1002/ss.20018.
- Lynette, S., & James, R. (2001). An examination of student cheating in the two-year college. Retrieved November 21, 2013, from <http://www.essay-911.com/essay-encyclopedia/examination.htm>
- McCabe, D. (2005). Levels of cheating and plagiarism remain high. Retrieved November 21, 2012, from The Center for Academic Integrity Website: http://www.academicintegrity.org/cai_
- McCabe, D. L., Trevino, L. K., & Butterfield, K. D. (2001). Cheating in academic institutions: A decade of research. *Ethics & Behavior*, 11(3), 219–232.
- Nonis, S., & Swift, C. (2001). An examination of the relationship between academic dishonesty and the workplace: A multicampus investigation. *Journal of Education for Business*, 77(2), 69–77.
- Parmjit, S., Roslind, X. T., & Mohd Adlan, R. (2014). Fit or unfit? Perspectives of employers and university instructors of graduates' generic skills. *Procedia – Social and Behavioral Sciences*, 123(2014), 315–324. Retrieved on April 21, 2014, from <http://ac.els-cdn.com/>
- Paula, W. (2004). Academic original sin: Plagiarism, the Internet, and librarians. *The Journal of Academic Librarianship*, 30(3), 237–242.
- Smith, M., Ghazali, N., & Siti Fatimah, N. (2007). Attitudes towards plagiarism among undergraduate accounting students: Malaysian evidence. *Edith Cowan University, Perth, Australia*. Retrieved October 12, 2012, from www.emeraldinsight.com/1321-7348.htm
- Wilkinson, J. (2009). Staff and student perceptions of plagiarism and cheating. *International Journal of Teaching and Learning in Higher Education*, 20(2), 98–105. ISSN 1812-9129. Retrieved October 1, 2011, from <http://www.isetl.org/ijthe/>

Chapter 59

Exploring Metacognitive Strategies of ESL Students During Online Listening Assessment

Zawani Badri and Mohd. Sallehuddin Abd. Aziz

Abstract Over the years, not many studies have been done to address various issues related to online language assessment. However, some studies have proven that students with high proficiency level tend to employ more metacognitive strategies compared to less proficient students during conventional listening assessment. For that reason, it is worth investigating the metacognitive strategies students employ when responding to an online listening assessment. In order to address this issue, a Metacognitive Awareness Listening Questionnaire (MALQ) was distributed to a total of 280 respondents and later semi-structured interviews were conducted. From the findings, it can be safely presumed that ‘problem solving strategy’ is the most frequently utilized strategy out of the five MALQ factors by the students when completing an online listening assessment. Moreover, the findings also indicate that a moderate linear positive correlation exists between English language grades with the five MALQ factors. Finally, the qualitative data analysed from the semi structured interviews disclosed that various aspects of metacognitive strategies were extensively employed by the students when completing their online assessment. Hence, the importance of incorporating metacognitive strategies when developing progressive listening course could not be underestimated.

Keywords Metacognitive Awareness Listening Questionnaire (MALQ) • Metacognitive strategies • Online listening assessment

59.1 Introduction

In the present, ICT has been integrated in the education domain to ensure that students benefit the most as the use technology has tremendously changed the way in which language is taught and assessed in the classroom. The use of ICT encourages

Z. Badri (✉) • M.S.A. Aziz
School of Language Studies and Linguistics, Universiti Kebangsaan Malaysia, 436000 UKM
Bangi, Selangor, Malaysia
e-mail: waniezawani72@gmail.com; drsallehuddin@gmail.com

students to become more autonomous with their own language progress and enables them to regularly monitor their language progress. Besides, it has also allowed teachers to administer language assessment in different ways as they can incorporate technology in assessing various language skills especially the listening skill. Bachman (2010) reiterated that the advancement of technology as well as the availability of numerous computer- and web-based applications has resulted in a variety of test formats and assessment procedures.

Despite many advantages that online testing can offer, Papadima-Sophocleous (2005) maintained that not many research studies have been carried out to address the “various aspects of current language testing practices, especially with the implications added by the use of technology,” (pp. 22–23). Goh (2008) however has emphasized that the way listening is assessed “has not really changed” over the years. Traditionally, L2 learners are still required to choose the correct answer from several options listed, write summaries as well as fill-in-the-gap questions which require L2 learners to complete sentences or texts using words that they hear from the listening input.

According to O’ Bryan and Hegelheimer (2009) and Bidabadi and Yamat (2013), students with high proficiency level tend to employ more metacognitive strategies during paper-and-pencil listening assessment. As such, it is worth examining whether this strategy can also bring about similar usage for online listening assessment. Vandergrift (2003) asserted less skilled listeners are unable to keep up with the input and hold meaning in memory during the online listening process. Rahimi (2012) believed that it is necessary to consider their cognitive and metacognitive awareness due to various aspects involved in dealing with technology.

Since computer- and web-based assessments have become an integral component of the teaching, it is significant to examine how technology can affect strategies employed by second language learners during an online listening assessment. Aponte-de-Hanna (2012) suggested that there is a need to acknowledge the process of listening comprehension because it can give ideas on what language learners do during the process of comprehending aural information. This is because Jamil et al. (2010) in their study asserted that test-taking strategies had been ignored by most educators as they believed that the process did not consider the ‘thinking’ process involved in producing the answers.

Moreover, there are very limited studies conducted concerning the issues of metacognitive listening awareness while engaging with online listening tasks (Rahimi 2012). Since the use of online listening assessment can still be considered at an infancy level in Malaysia and the significance of metacognitive awareness during the second language L2 listening process, (Vandergrift et al. 2006), it is important to assess the metacognitive strategies used by L2 learners during listening comprehension, particularly in responding to an online listening assessment. Thus, it is significant to investigate whether metacognitive awareness would bring about positive impact if the medium of listening assessment is changed from paper-and-pencil to a computer- or web-based assessment.

59.1.1 Objectives of the Study

This study would attempt to identify learners' metacognitive awareness strategies as measured by the five MALQ factors (directed attention, mental translation, person knowledge, planning and evaluation, and problem solving) employed by students when completing the online listening assessment. This study is also conducted to investigate how various aspects of metacognitive awareness of L2 listening would relate to the L2 language proficiency. To address the objectives of the study, three research questions are constructed:

1. Which metacognitive awareness listening strategy is commonly employed by ESL students during an online listening assessment?
2. Is there any significant relationship between various aspects of metacognitive strategies of L2 listening to L2 proficiency?
3. How do students employ various aspects of metacognitive strategies as measured by each of the five MALQ factors during an online listening assessment?

59.2 Metacognitive Framework for L2 Listening

Previous studies conducted in this area have adopted Flavell's (1979) model of metacognitive knowledge as the theoretical framework of their studies, (Goh 1997, 1998, 2008; Vandergrift et al. 2006; Rahimi 2012; Goh and Hu 2014). Flavell (1979) defines metacognitive knowledge as "knowledge or beliefs about what factors or variables act and interact in what ways will affect the course and outcome of cognitive enterprise", (p. 907). This metacognitive knowledge can be categorised into three subcategories which are person knowledge (knowledge about oneself as learner), task knowledge (knowledge about the nature and demand of the task) and strategy knowledge (knowledge about strategies that students use to achieve learning goals), (Vandergrift et al. 2006). In relation to this study, Vandergrift's et al. (2006) five-factor model of metacognitive awareness was adopted as this model was also derived from Flavell (1979) metacognitive knowledge framework. From this framework, five distinctive metacognitive factors were constructed in relation to metacognitive awareness as self-regulation in L2 listening, namely problem-solving, planning and evaluation, mental translation, person knowledge and directed attention and each factor comprises different listening strategies to represent metacognitive strategies, (O'Bryan and Hegelheimer 2009). Figure 59.1 illustrates the visualisation of theoretical framework adapted for this study:

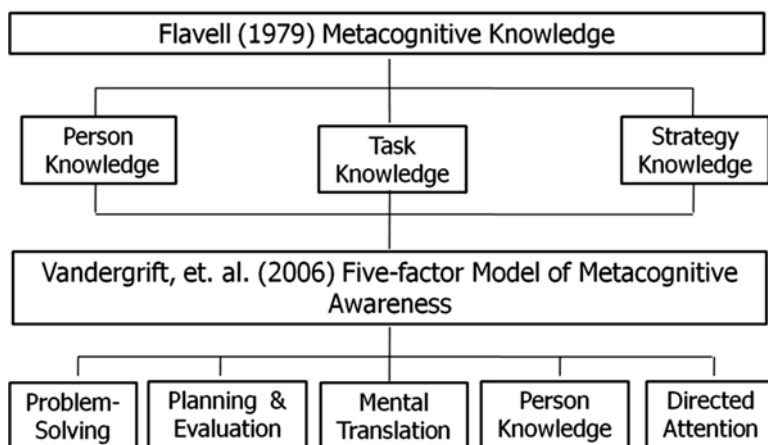


Fig. 59.1 Theoretical framework for metacognitive awareness during L2 listening

59.2.1 Studies on Metacognitive Strategies and Listening

There were numerous studies that have conducted in the past years to observe the use of metacognitive strategies during the listening process. However, the study conducted by Vandergrift et al. (2006) has brought about a new paradigm in assessing listeners' metacognitive awareness with the development of a listening questionnaire known as Metacognitive Awareness Listening Questionnaire (MALQ). Since then, various studies have adopted this questionnaire, either in purely quantitative studies (Dabbagh and Noshadi 2014; TafarajiYeganeh 2013; Goh and Hu 2014; Kassaian and Ghadiri 2011) as well as in mixed methods study (Li 2013; Bidabadi and Yamat 2013; O'Bryan and Hegelheimer 2009). Besides, MALQ is also utilised to assess the success of the programme or experiment designed like metacognitive strategy instruction in order to improve students' listening performance (Coşkun 2010; Selamat and Sidhu 2011; Tabeei et al. 2013; Dousti and Abolfathiasl 2013).

Since most of the studies such as Dabbagh and Noshadi (2014) and Goh and Hu (2014) were conducted as to elicit students' use of metacognitive strategies during conventional listening assessment, this study, on the other hand, requires students to write five entries in their students' portal after listening to assigned audio books that are available online. Since most of the listening materials utilised during the conventional listening assessment are usually 'tailored', Scutter et al. (2010) believed that the use of online listening materials like audio books can appraise a greater range listening strategies since students need to critically listen and respond to the audio texts and at the same time employ various listening skills. Since students have to deal with the complexity of the listening materials and at the same time cope with

technological features related to online listening process, it can be a challenge for some of them.

59.3 Method

This is a mixed-methods case study and Design 7 as proposed in Two-Dimensional Mixed Method Model by Onwuegbuzie and Collins (2007) was employed as a sampling technique. As for time orientation, sequential design was employed as the quantitative phase was administered first before the semi-structured interviews were conducted. As for the relationship of the samples, nested sampling was opted for this study as sample members were selected because they were believed to represent the subset of those who involved in other stages of the investigation.

59.3.1 Subject

For the quantitative phase, the researcher used convenience sampling as the subjects were believed to be easily accessible and proximal to the researcher. Therefore, based on the formula as proposed by Morgan and Krejcie (1970) in determining sample size, 280 out of 856 first-semester diploma students from Universiti Teknologi MARA (Alor Gajah Branch) were chosen to participate in this study. These respondents were chosen as they were the first batch of students who underwent the ELC 120 (Integrated Language Skills: Listening) course for the first time. This course emphasizes on building students' listening skills with the integration of speaking and reading skills.

The qualitative phase however utilises simple random sampling in determining the respondents for the semi-structured interview. A total of seven students were interviewed as they were believed to be a subset from a larger population and their cases were compared to all others in the sample until the researcher believed that the collective voices had led to data saturation, (Onwuegbuzie and Leech 2007, p. 243).

59.3.2 Instrument

The instrument that was utilised in order to assess students' metacognitive awareness is the Metacognitive Awareness Listening Questionnaire (MALQ) developed by Vandergrift et al. (2006). This questionnaire consists of 21-likert items that were developed in relation to Flavell's (1979) three subcategories of metacognitive knowledge in which are person knowledge, task knowledge and strategy knowledge, (Vandergrift et al. 2006). In terms of item validity, the draft version of MALQ

were verified by correlating the scores of listening comprehension test scores of 996 respondents with different demographic background, (Vandergrift et al. 2006).

59.3.3 Interview

For the qualitative phase, the interview had been transcribed verbatim by the researcher as the data was analysed using open-coding and axial coding. There were five themes generated from the analysis namely planning and evaluation, directed attention, person knowledge, mental translation and problem-solving and each theme has its own coding associated with the strategies that the participants had employed when completing online listening assessment.

59.3.4 Procedures

For the data collection, the students were required to complete an online Personal Listening Log Activity (PLLA) in which they had to write five entries in the student's portal, in order to respond to the links of audio books available online that were assigned earlier to them. After they have completed the assessment, the adopted Metacognitive Awareness Listening Questionnaires (MALQ) questionnaires were distributed and the qualitative phase began after the quantitative data gathered from the questionnaire was analysed thoroughly. In order to analyse the data collected, the data from the adopted MALQ was gathered and tabulated using SPSS version 22.0 as the mean for each sub-strategy was tabulated and compared. Subsequently, in order to analyse how various aspects of metacognitive awareness of L2 listening would relate to L2 proficiency, simultaneous multiple regression was run with the five MALQ factors served as predictor and the outcome variable was SPM English language grades.

59.4 Data Analysis

Table 59.1 shows the descriptive analysis of the Metacognitive Awareness Listening Questionnaire (MALQ), and it is obvious that problem-solving has the highest mean score (4.53) with a standard deviation of 1.03. This indicates that the students were able to check their understanding of the listening assessment as well as they were able to find solutions to the problems occurred while completing the assessment. Secondly, it can be assumed that the students had planned ahead in their mind before they were listening since planning and evaluation has the second highest mean score (4.49) with a standard deviation of 0.74. In addition, the mean score for

directed attention is 4.32 with a standard deviation of 0.65 which indicates that the students were able to maintain their attentiveness during an online listening assessment and ignoring the distractions. Meanwhile for person knowledge, it can be concurred that the students have a moderate level of anxiety and self-confidence as the mean score is 3.26 with a standard deviation of 0.68. And finally, mental translation shows the lowest mean score of 2.65 with a standard deviation of 0.84, indicating that students in this study fairly translated the L2 listening text to L1.

In order to assess the relationship between various aspects of metacognitive strategies of L2 listening with L2 proficiency, a simultaneous multiple regression was run with the five MALQ factors served as predictor and the outcome variable was SPM English language grades. From the data analysed, there is a moderate linear positive correlation between English language grades with the five MALQ factors as the coefficient of correlation, R is 0.257 (25.7 %). Besides, the R square value is 6.6 % (0.066); indicating the variation of test scores was only explained 6.6 % by the model (the five MALQ factors) while 93.4 % is explained by other factors. In addition, the overall regression model was statistically significant as the F value is 3.86 with $p < 0.05$. Furthermore, out of the five MALQ factors, only person knowledge was significant predictors for the outcome measure of L2 proficiency as it contributed 0.037 indicating that respondents with better language proficiency used this strategy more frequently compared to other factors (Table 59.2).

Table 59.1 Mean scores for Metacognitive Awareness Listening Questionnaire (MALQ) factors (N= 280)

	Mean	Std. deviation
Problem solving	4.5343	1.03278
Planning and evaluation	4.4914	.74077
Mental translation	2.6571	.84943
Directed attention	4.3214	.65568
Person knowledge	3.2690	.68945

Table 59.2 Model summary for simultaneous multiple regression of MALQ factors on L2 listening proficiency (N=280)

Model summary				
Model	R	R square	Adjusted R square	Std. error of the estimate
1	.257 ^a	.066	.049	.44621

59.4.1 *The Analysis of Semi-structured Interviews*

As for the qualitative phase, it is found that various aspects of metacognitive strategies as measured by the five MALQ factors were extensively employed by the students while completing the online listening assessment. For planning and evaluation, it can be asserted that the respondents believed that they must have a good understanding of the short stories in order to stay more focus during the process. From the data analysed, S1, S2, S5, S6 and S7 believed that they *must understand the whole story* in order to be able to complete the task. In evaluating the outcomes of the listening process, it can be pointed out that S3, S4 and S5 believed that *to be more focus* could help them to complete the online listening task better. In addition, searching for prior knowledge about the listening is also believed to be helpful, for instance, one of the participants, S4 had *planned to find script* [synopsis of the short stories] *from Google* [on the Internet] before listening to the short stories.

In order to help the students to be attentive while listening to the tasks, the students believed that repeating the tracks could help them to concentrate and stay focussed. This is because majority of the students *replayed the short stories either from the beginning of the story or from the part* [they] *do not understand* if they had problems understanding them. Furthermore, being selective listener is also another accommodating strategy as they know what kind of information that they are supposed to listen to. For example, S5 pointed out that *finding the points that can give clues to understand* the short story can be helpful in completing the online listening assessment.

In relation to person knowledge, majority of the participants did not feel anxious or less confident when performing listening tasks as out of seven students, only S7 can be perceived as having some internal challenges while completing the online listening assessment. S7 highlighted that his [poor] *listening skills* have become a barrier to comprehend the short stories and further explained that this activity was different from other listening activities that had been conducted in class with the help of the lecturer as *you must be very concentrate on* [depend on] skills to listen and take notes. Besides anxiety and the lack of self-confidence, S1, S4, S5 and S6 maintained that they have problems to understand the short stories because of the narrators of the short stories as they had problems with the *accent used* and *difficult words* [vocabulary]. In addition, S2 also pointed out other shortcomings of the listening passages like the ways the short stories were narrated as *boring* [monotonous] and *the* [length of] *audio is too long*. Beside listening passages, S2 and S7 also discovered that *noisy* [discouraging] *environment* had become a challenge for them to complete the online listening task. From the findings, it can be assumed that students were able to point out several external factors can be a challenge for them to understand the story.

As for mental translation, majority of the students believed that translation had assisted them to *understand the short stories* as they would *translate the key points* of the stories. On the other hand, S3 only *translated some words* as *it helps me to think more* [about] *the story*. However, some of the students did not rely heavily on the translation as they were able to comprehend the general idea of the stories easily

without much interference from their L1. For example, S2, S6 and S7 emphasised that they did not translate *all the time* as S2 further explained that this process did not occur if the message of the short stories is comprehensible as she *just listen* [to the audio] *with only few problems*. S2 further explained that if *I know the situation or the general ideas, I don't translate*. When she was asked about how she used L1 during the assessment, S2 claimed that she is *not aware of it* [although] *I am not good with grammar but I can tell what the narrator is trying to say*.

For problem solving, it can be implied that the students were still lacking of strategies on making inferences because majority of the students were relying heavily on dictionary and translation tools. For instance, S1, S4, S5 and S7 preferred to *use dictionary and Google Translate* to figure out the meanings of the words that they did not understand. Besides, S2, S3 and S5 asserted that they would try to get the bigger picture of the short stories by *reading the summaries or synopsis of the stories* as S2 and S3 further clarified that they *searched information on the characters* and *read on themes for general ideas*. S2 further added several suggestions that could be helpful in order to have better understanding of the stories such as having *various narrators instead of one in a short story* as well as adding *background sounds, for example, if the setting of the story is at the beach, I prefer to have wave sound*. From this, it can be implied that the students have the abilities to indentify the obstacles in understanding the listening audio and continuously monitor them in order to ensure that they will not impede the listening process.

59.5 Discussion and Conclusion

One of the objectives of the study was to assess metacognitive strategies used by students during L2 listening comprehension activity, particularly in responding to an online listening assessment. From the findings, it can be safely inferred that 'problem solving' is the most frequently employed strategy by the students when completing the online listening assessment. The findings do not differ much from Vandergrift's (2003) as he concurred that more skilled listeners actively involved in planning and monitoring process during listening task as they are more in control of the process, (p. 485). In addition, Goh and Hu (2014) found that problem solving and directed attention scored the highest mean scores, proving that there is a significant relationship between respondents' listening performance and these strategies. Meanwhile for person knowledge, it can be concurred that the respondents have moderate level of anxiety and self-confidence during the online listening process. Goh and Hu (2014) have highlighted that the students' low anxiety level and high self-confidence can be a key indicator of high listening proficiency level as they can perform better when listening. Another key determiner of a successful listener is the low score of mental translation as Vandergrift (2003) accentuated that less skilled listener will translate more than skilled listeners. Thus, it can be presumed that the students have the characteristics of skilled listeners as the participants in this study moderately translated the L2 listening text to L1.

In addition, this study is also conducted in order to analyse how various aspects of metacognitive awareness of L2 listening would relate to L2 language proficiency. From the findings, a moderate linear positive correlation between English language grades with the five MALQ factors was evidently shown with 25.7 % of correlations between MALQ scores with listening performance. This percentage is slightly higher than percentage reported by Vandergrift (2006) as the study reported almost similar results with a correlation of 13 %, proving that there is a significant relationship between MALQ scores and listening tests. He further added that although the correlation is moderate, it is still meaningful as it accounted for the variability in listening performance, (Vandergrift (2006).

Besides, only person knowledge was significant predictors for the outcome measure of L2 proficiency indicating that students with better language proficiency utilised this strategy more often in comparison to other factors. Since person knowledge deals with learners' confidence and beliefs on their learning, Vandergrift (2003) pointed out that normally only skilled learners are able to have more controls during listening process by checking, verifying and correcting their understanding on the subject matter. Goh and Hu (2014) also found out that person knowledge is the most positive predictor of L2 listening proficiency. This is probably due to the extensive listening practices and exercises that had been done throughout the course. Besides, Li (2013) also discovered in his study that students with higher scores have greater controls as they were able to actively monitor their progress in listening process.

The data analysed from semi structured interviews disclosed that various aspects of metacognitive strategies were extensively employed by the students while completing the online listening assessment. For planning and evaluation, it can be asserted that the students believed that they must have a good understanding of the short story as to stay more focus during the process can be an assisting strategy to help students' mastery of listening skills. Vandergrift (2003) asserted that evaluating the approach applied, decisions made and outcomes of the listening task are also an important element in assessing students' metacognitive strategies, specifically evaluation. In addition, searching for prior knowledge about the listening is also believed to be helpful as supplementary texts such as listening transcription, questions, and scaffolding exercises can assist students to complete the listening tasks, (Vandergrift 2003; Bidabadi and Yamat 2013; Talalakina 2013).

For directed attention, the students believed that repeating the tracks could help them to be attentive as this process gives them more time to deal with information from the input as well as the relationships between syntactic forms, (Hatch, 1983 as cited in O'Bryan and Hegelheimer 2009). Besides, Bloomfield et al. (2010) accentuated that learners proficiency should also be taken into consideration in determining the success of the process. Therefore, it is suggested that designing materials that allowed listening texts to be repeated is important in order to assist learners to practice listening, (O'Bryan and Hegelheimer 2009). Furthermore, being selective listener is also believed to be another accommodating strategy as Flavell (1979) stressed that paying specific attention to the main points is a good way to retain large bodies of information. Aponte-de-Hanna (2012) also suggested visuali-

sation can help students to restrict their focus on what the speaker is trying to convey in the audio. Therefore, it is important to educate students' to redirect their attention to a listening text as Bidabadi and Yamat (2013) believed it is a key strategy to help learners to comprehend the listening texts.

In relation to person knowledge, majority of the respondents did not feel anxious or less confident when performing listening tasks as this probably due to the exposure that they received throughout the semester. Bloomfield et al. (2010) asserted that anxiety can affect students' comprehension ability especially when they are concerning too much on the complexity of the message. Besides, the listening materials adopted in this online listening assessment can be another reason as Talalakina (2013) revealed that the use of audio books can reduce their anxiety when dealing with authentic listening materials. Furthermore, O'Bryan and Hegelheimer (2009) pointed out that this strategy is also related to identify difficulty of listening passage as students were able to point out several external problems such as narrator's accent and the length of the audio. Bloomfield et al. (2010) have pointed out that accent can negatively influence L2 listening comprehension rather than L1 since non-native speakers are less familiar with accent because of the fast speech rate and noise. Besides, lengthy audio can also impede listening comprehension due to information density since the brain has to process too many words during the process, (Bloomfield et al. 2010). Furthermore, Goh (2008) also asserted that L2 listeners should also be able to identify listening problems, causes as well as solutions when they develop a better knowledge of self.

As for mental translation, the role of L1 can be seen as inevitable during the listening process. Goh and Hu (2014) claimed that this process is common among most language learners especially for those who are exposed to bottom-up listening instruction although Vandergrift (2003) argued that this will obstruct them to keep up with the incoming input and later cause greater trouble to hold meaning in their memory. However, some of the respondents were able to comprehend the general idea of the stories easily without much interference of their L1. This finding can be associated with students' motivation to complete the online listening assessment as Kassaian and Ghadiri (2011) in their study associated mental translation with motivation as they claimed that less use of mental translation strategies is associated with having intrinsic motivation to complete the listening task.

Last but not least, it can be inferred that the students were not being critical in problem solving strategy as they were unable to infer the meaning of the unknown words by making inferences since they rather looked up the meaning of the words in dictionary. Vandergrift (2006) clarified that in problem-solving strategy, learners should make inferences of what they have difficulties in understanding and keep on monitoring them. Although the finding is contradictory with the strategies suggested by Vandergrift (2006), Bidabadi and Yamat (2013) proposed that being able to identify the existence of the problems like knowing the definition of the new words can assist learners to employ certain strategies in order to comprehend the listening texts. This is because while completing the online listening assessment, the respondents were able to identify the existence of problems and find the appropriate solutions, for example, searching for additional information in order to get the

general ideas of the stories. While listening to an English text, Bidabadi and Yamat (2013) believed that prior and background knowledge is important as to search for options to problems arise during the listening activity.

In order to answer which metacognitive awareness listening strategy is commonly employed by ESL students during an online listening assessment, problem solving is identified as the most commonly employed strategy during online listening assessment. Bidabadi and Yamat (2013) accentuated that the ability to identify the problems that can impede their ability to comprehend the whole listening texts such as discovering the meaning of the unknown words is also associated with this strategy. Furthermore, this strategy is common among L2 listeners as they often encountered difficulty in understanding the general idea of the story due to problems of understanding certain unfamiliar words. Therefore, L2 students will eventually attain this strategy indirectly as they will somehow encounter the same situation in other language skills as well. Besides, the students were also able to find solutions for the encountered problems probably due to amount of listening practices that they have been exposed throughout the semester. Thus, it can help them to acquire this strategy easily compared to other metacognitive strategies discussed in this study.

In order to address the second research question, it can be presume that there is a moderate correlation between various aspects of metacognitive strategies of L2 listening related to L2 proficiency, demonstrated that more skilled L2 listener employed these strategies while completing the online listening assessment. Although the statistical data was moderately significant, it can be regarded as accommodating factors to the success of L2 listening as Vandergrift (2006) believed that it can offer variability to listening performance. Besides, person knowledge factor is found to be more frequent among students with better language proficiency as they exhibited better self-assurance and less anxiety when dealing with online listening tasks. This finding can be helpful for less skilled listeners as they have to feel at ease when dealing with L2 listening materials in order to gain more confidence and help them to feel less anxious.

Finally, for the last research question, the respondents had employed various aspects of metacognitive strategies as measured by the five MALQ factors extensively while completing the online listening assessment. However, the results also varied as there are similarities and differences in how the metacognitive strategies were employed. This is probably affected by respondents' individual differences, for example, less use of mental translation strategies is associated with intrinsic motivation, (Kassian and Ghadiri 2011). To add, Jamil et al. (2010) further discussed the issue of individual differences as they believed that some strategies can be effective for certain students but other students might find it less helpful. In addition, they asserted that students regardless of their language proficiency level do utilise test-taking strategies but it will vary individually, according to their personal preferences (Jamil et al. 2010).

In conclusion, this study intended to assess metacognitive strategies used by the learners during L2 listening comprehension activity, particularly in responding to online listening assessment. From the findings, it can be safely inferred that that

problem solving is the most frequently employed strategy by the participants when completing the online listening assessment. Moreover, this study is conducted in order to analyse how various aspects of metacognitive awareness of L2 listening would relate to L2 language proficiency. From the findings, a moderate linear positive correlation between English language grades with the five MALQ factors was evidently shown with 25.7 % of correlations between MALQ scores with listening performance. Besides, it can be presumed that only person knowledge was significant predictors for the outcome measure of L2 proficiency indicating that respondents with better language proficiency utilised this strategy often in comparison to other factors. Finally, this study would also like to identify learners' metacognitive awareness strategies employed by students while completing online listening assessment. The data analysed from semi structured interviews disclosed that various aspects of metacognitive strategies as measured by the five MALQ factors were extensively employed by the respondents while completing the online listening assessment. In order to address the issue of listening in L2 classroom, it is recommended for future research to conduct an in-depth study on how students from different levels of language proficiency employed various metacognitive strategies. Since the course that the participants of the study had to undergo focused on reinforcing their listening skills, it is also important to integrate trainings on metacognitive strategies in developing the course syllabus. This is important especially when the lecturers have to deal with sophisticated listening materials that required their students to work with authentic texts rather than tailored listening recordings that are normally utilised in the existing curriculum in the present. Undoubtedly, it is theoretically verified that there is a need to incorporate metacognitive strategies in the teaching of listening in L2 classroom, especially when it is integrated with technology.

References

- Aponte-de-Hanna, C. (2012). Listening strategies in the L2 classroom: More practice, less testing. *College Quarterly*, 15(1), 9–18.
- Bachman, L. F. (2000). Modern language testing at the turn of the century: Assuring that what we count counts. *Language Testing*, 17(1), 1–42.
- Bidabadi, F., & Yamat, H. (2013). EFL learners' perceptions towards meta-cognitive strategy use in English language listening. *GEMA Online Journal of Language Studies*, 13(3), 31–43.
- Bloomfield, A., Wayland, S. C., Rhoades, E., Blodgett, A., Linck, J., & Ross, S. (2010). *What makes listening difficult? Factors affecting second language listening comprehension*. MARYLAND UNIV COLLEGE PARK.
- Dabbagh, A., & Noshadi, M. (2014). Crossing metacognitive strategy awareness in listening performance: An emphasis on language proficiency. *International Journal of Applied Linguistics & English Literature*, 3(6), 234–242.
- Dousti, H., & Abolfathiasl, H. (2013). The effect of metacognitive listening strategy Training on EFL learners' listening sub-skills performance. *International Journal of Applied Linguistics and English Literature*, 2(4), 50–55.
- Flavell, J. H. (1979). Metacognition and cognitive monitoring. *American Psychologist*, 34(10), 906–911.

- Goh, C. (2008). Metacognitive instruction for second language listening development theory, practice and research implications. *RELC Journal*, 39(2), 188–213.
- Goh, C. C., & Hu, G. (2014). Exploring the relationship between metacognitive awareness and listening performance with questionnaire data. *Language Awareness*, 23(3), 255–274.
- Jamil, A., Aziz, M. S. A., & Razak, N. A. (2010). The utilisation of test-taking strategies among female students in a tertiary institution. *GEMA Online Journal of Language Studies*, 10(3), 105–125.
- Kassaian, Z., & Ghadiri, M. (2011). An investigation of the relationship between motivation and metacognitive awareness strategies in listening comprehension: The case of Iranian EFL learners. *Journal of Language Teaching and Research*, 2(5), 1069–1079.
- Li, W. (2013). A study of metacognitive awareness of non-English majors in L2 listening. *Journal of Language Teaching and Research*, 4(3), 504–510.
- O'Bryan, A., & Hegelheimer, V. (2009). Using a mixed methods approach to explore strategies, metacognitive awareness and the effects of task design on listening development. *Canadian Journal of Applied Linguistics (CJAL)/Revue canadienne de linguistique appliquée (RCLA)*, 12(1), 9–38.
- Onwuegbuzie, A. J., & Collins, K. M. T. (2007). A typology of mixed methods sampling designs in social science research. *The Qualitative Report*, 12, 281–316. Retrieved from: <http://www.nova.edu/ssss/QR/QR12-2/onwuegbuzie2.pdf>.
- Onwuegbuzie, A. J., & Leech, N. L. (2007). Sampling designs in qualitative research: Making the sampling process more public. *The Qualitative Report*, 12(2), 238–254.
- Papadima-Sophocleous, S. (2005). *Development, implementation and evaluation of an online English placement test at college level: A case study*. Doctoral dissertation, Middlesex University.
- Rahimi, A. H. (2012). On the role of strategy use and strategy instruction in listening comprehension. *Journal of Language Teaching and Research*, 3(3), 550–559.
- Scutter, S., Stupans, I., Sawyer, T., & King, S. (2010). How do students use podcasts to support learning. *Australasian Journal of Educational Technology*, 26(2), 180–191.
- Selamat, S., & Sidhu, G. K. (2011). Student perceptions of metacognitive strategy use in lecture listening comprehension. *Language Education in Asia*, 2(2), 185–198.
- Tabeei, S., Tabrizi, A. R. N., & Ahmadi, G. (2013). The effect of metacognitive strategies instruction on listening comprehension of Iranian EFL learners: Focusing on gender. *International Journal of Language Learning and Applied Linguistics World*, 4(4), 13–29.
- TafarajiYeganeh, M. (2013). Metacognitive listening strategies awareness in monolingual versus bilingual EFL learners. *Procedia-Social and Behavioral Sciences*, 70, 1787–1793.
- Talalakina, E. V. (2013). Audiobook in advanced ESL classroom: Developing critical listening. In *Proceedings of the international conference ICT for language learning* (5th ed.). Retrieved from <http://conference.pixelonline.net/ICT4LL2012>
- Vandergrift, L. (2003). Orchestrating strategy use: Toward a model of the skilled second language listener. *Language Learning*, 53(3), 463–496.
- Vandergrift, L., Goh, C. C. M., Mareschal, C., & Tafaghodtari, M. H. (2006). The Metacognitive Awareness Listening Questionnaire (MALQ): Development and validation. *Language Learning*, 56(3), 431–462.

Chapter 60

Effectiveness of Courseware Presentation Using Learning Theory for a Programming Subject

Mohd Nor Hajar Hasrol Jono, Rahayu Hasanordin, Shazwani Salleh, Mohamad Ibrahim, and Azlan Abdul Aziz

Abstract The need to integrate multimedia in the process of teaching and learning at all level of education is becoming more significant. Multimedia based e-learning is seen as an effective alternative in teaching and learning process. This method is able to create a student-centered learning where students are encouraged of being independence; study at their own pace and at their own place. Nevertheless, the rapid development of information and communication technologies (ICT) in today's world has necessitate a new trend in the presentation of information in the form of flash video, which is more easy to understand and accessible instantly to users. The research is undertaken by introducing multimedia courseware by maintaining the concept of Gagne Theory of Nine Events. A new courseware entitled "Introduction to Computer Programming C++" that has been developed using learning theory was being studied to examine the effectiveness of courseware presentation using learning theory that may allow users to interact simultaneously with the material. The courseware is expected to be an effective teaching aid to entice students in the subject programming. The study was conducted in Faculty Applied Science, Universiti Teknologi Mara Shah Alam. Thirty students were selected as respondents. The courseware evaluation was implemented using a set of questionnaire that used a 5 point Likert scale. This questionnaire was administered to the respondents during their first semester. The results obtained were very positive and encouraging.

M.N.H.H. Jono (✉) • S. Salleh • A.A. Aziz
Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA,
40450 Shah Alam, Selangor, Malaysia
e-mail: hasrol@tmsk.uitm.edu.my; shazwanisalleh@yahoo.com;
azlan225@salam.uitm.edu.my

R. Hasanordin
Faculty of Business Management, Universiti Teknologi MARA,
Puncak Alam Campus, 42300 Bandar Puncak Alam, Selangor, Malaysia

M. Ibrahim
Faculty of Art, Computing and Creative Industry, Universiti Pendidikan Sultan Idris,
35900 Tanjung Malim, Malaysia
e-mail: mohamad@upsi.edu.my

Students generally found the multimedia-mediated web-based learning environment were enjoyable and motivating, also were able to demonstrate their learning and skills of the subject area.

Keywords e-Learning • Courseware • Courseware presentation and Gagne theory of nine events

60.1 Introduction

60.1.1 Background of Study

At present, the usage of multimedia in all degree of learning and educating has turn out to be more significant for the students and instructors. Multimedia based on e-learning is a great way in instructing and studying process. This method allows the students to complete their training effortlessly at off-hours or from home (Kruse 2002). Furthermore, the growing development in information and communication technologies (ICT) into the sector will provide positive impact to students and instructors within the process of teaching and learning.

Programming language is a useful skill and might contribute benefits to the learners to seek out for a rewarding however it is difficult to learn and it frequently becomes a high failure rates (Robins et al. 2003). Courseware (online learning material) in other word is computer based learning, which refers to the use of computers for the delivery of instruction in an interactive mode is developed using learning theory to help students in learning programming. Hence, using multimedia application for example flash video in the presentation of information nowadays will assist the learners to understand in a better way to convey materials.

60.1.1.1 E-Learning

In Malaysia, e-learning is no longer a new phenomenon; however it does not end up becoming a hot topic. E-learning can also be known as distance education or distance learning in which student can study on their own without having to go to class. E-learning environment has grown to be the most important part of the strategy for conveying online and flexible learning. It has established itself as option in all degree of education, particularly in higher education, where it is ready to take on a larger role. The dissemination of information and communication technology (ICT) has enabled existing and new institutions of higher learning in Malaysia to offer their educational services to a wider market place and in many instances, beyond geographic locations (Endut et al. 2012). The demand for education, then again has grown so rapidly in the past few decades makes everything in relation to education

is acceptable. In relation with the courseware presentation, it is one of the technique to integrate the use of e-learning as to ensure the success in teaching and learning.

According to Mohd Nor Hajar Hasrol Jono et al. (2013), stated that Dato ‘Seri Mohamed Khaled Nordin, Minister of Higher Education Malaysia has ordered the National e-Learning Policy to plan and deliver a framework and direction for the implementation of e-learning in Malaysian Higher Education Institutions (HEIs) for a period of five (5) years from 2011 to 2015. Hence, it will be capable to move forward to a better aspect of e-learning and assist to support learning in a more personal, flexible, portable, and on-demand manner.

60.1.1.2 Interactive Multimedia

Interactive multimedia in education and training seems to be the necessity in sharing information and knowledge on the research and practices of using multimedia in many educational surroundings (Mishra and Sharma 2005). Multimedia is the process of delivering message or information in the form of text, figures, images, sounds or moving images which are displayed on a screen and in some cases computer screen and television monitor are used to enhance the learning process.

Interactive multimedia is interesting since there is an opportunity for profound involvement, which captures and holds learners’ interests. Interactive multimedia is also attractive because it is multi-sensory by integrating sounds, images, and text. Moreover, it is individualized, which allows the learners to navigate through information to build their own unique mental structures based on exploration.

Holbert and Karady (2008) state studies have shown that people retain 25 % of what they hear, 45 % of what they see and hear, and almost 70 % when they actively participate in the process (Holbert and Karady 2008). Thus, the use of interactive multimedia in lectures can become an important teaching aid to generate active participation from students.

Mayer (2003) strongly claim that the usage of multimedia is an effective teaching and learning tool, as he stated that, “the promise of multimedia learning is that teachers can harness the power of visual and verbal forms of expression in the service of promoting understanding of students” (as cited in Neo et al. 2011). Interactive multimedia is interesting because there is a chance for deep involvement, which captures and holds learners interest and also can help in easing the process of knowledge transfer effectively especially for distance learning program or part time.

60.1.2 Problem Statement

Programming language is a useful skill and may contribute benefits to the students to hunt for a rewarding profession. However, learning a programming subject is challenging for a novice programmer who does not have a programming basic skill (Robins et al. 2003). A study conducted by Norasyikin Zaid and Zaidatun Tasir

(2011) stated that the programming language C++ is a programming language that is easy to learn as the basic of programming for students. This is verified by the analysis presented in the database of i-Learn Centre of Academic & International Affairs Division of the Universiti Teknologi MARA where it is shown that based on the 14 faculties under Science and Technology cluster, 10 faculties offer Programming C++ as their basic programming course.

In addition, according to Teague and Roe (2008), the introductory programming subject usually has high failure rates (Teague and Roe 2008). This is also supported by the analysis from internal resources of Universiti Teknologi Mara, Shah Alam based on the statistics gained from the Faculty of Applied Sciences only, the students who fail in programming subject are more than 25 % whereas percentages of control failure is 10 %. Then again, the first year students from the Faculty Applied Science need to study programming subject even though they are not exposed to any programming concepts. This would be the integral part of the integration of courseware in teaching and learning that would bring positive impact for students' better understanding with anticipation it will lead the reduction number of failures.

As far as research goes, it does not appear to be much research in Malaysia that is actually done in this e-learning in courseware especially in the area of learning theory on the failure of programming subject. Consequently, inadequacy of systematic teaching and learning materials especially using learning theory towards programming subject that can encourage more comprehensive study should be conducted to provide appropriate teaching and learning materials and course content. Besides that, the dissemination of knowledge related to the course will be more systematic, efficient and effective. It possibly will be able to encounter the requirements of students who are less interested in learning programming that could help students to develop and strengthen their performance in the classroom. This objective of this study is to examine the effectiveness of courseware presentation using learning theory for programming subject. The findings would assist in developing better courseware presentations, becoming good references and resources activities for the programming subject in future.

60.2 Literature Review

60.2.1 Introduction

The use of information technology in education has grown rapidly. The present of e-learning is about creating and using computer-based systems to well support learning activities (Rosenberg 2001). Students can learn by way of themselves without going to the class as long as they have an internet connection and a personal computer. The combination of multimedia and e-learning pedagogy will produce the effectiveness of learning pedagogy in order to assist students in their learning process. Numerous practices of e-learning have been developed around the world

and show the exciting innovations to improve individual learning (Zhang and Nunamaker 2003).

60.2.2 Benefits of e-Learning

According to Liaw et al. (2007), some great benefits of e-learning have been mentioned in lots of articles (Bouhnik and Marcus 2006; Liaw et al. 2007; Raab et al. 2002; Shotsberger 2000). Bouhnik and Marcus (2006) mentioned that e-learning has four benefits. First is the freedom to decide when each online lesson will be learned. Second is less of dependence on the time constraints of lecturers. Third would be the freedom to express their views and ask questions, without limitations. Finally, the accessibility to the course's online materials at students' own selection.

Students will be able to begin the process of learning anywhere and at any time when they are free. Thus, they will be more focused and able to improve their performance. They also do not need to meet with their lecturers often because they already have effective learning materials that can be a source of reference in studies. E-learning can be a medium for students to do an online discussion with the lecturer and their peers. At present, the academic field can place course materials online for students to access and also come out with online activities as well as discussions to improve students' understanding and encourage deeper learning (Endut et al. 2012).

Learners can proceed through the training program at their own pace and in their own place where they are able to access the e-Learning course at any time in their own needs. Thus it is actually assist students in learning programming due to it takes about 10 years of practice to make the novice programmer to expert programmer (Nandigam and Bathula 2013) learn how to develop a program is difficult. Novice programmer needs a lot of time to learn to be an expert programmer hence they require a source of reference that may help them regardless of time and place.

60.2.3 Gagne Theory of Nine Events

The first one of educational psychologists to take alongside in combination all of the mechanisms of an instruction theory, from setting goals to measure performance was Robert Gagne (Tennyson 2010). Theory of Gagne Learning Model (1985) highlights on the intentional or purposeful learning, which is the type of learning that, occurs in school or specific training programs (Mohd Nor Hajar Hasrol et al. 2013).

The nine events of instruction are the best solution for learning process. It makes use of all aspects of testing, practicing, and uses the information that will be shown. Robert Gagne's 'Nine events of instruction' framework outlines a few key activities that should be included in a course and helps to decide the order through which activities should be delivered to learner. The nine events are; gaining attention, informing the learner of the objective, stimulating recall of prior knowledge, present-

ing information, providing guidance, eliciting performance, providing feedback, assessing performance, and enhancing retention and transfer.

In general, it is not only the practice of instructional design has a strong influence on the work of Gagne but as well the methods that courseware is designed and hardware is used for instruction will provide a strong effect (Thomas 2010). In continuation of learning theory research, multimedia developers will capable to incorporate the concept of teaching and learning with multimedia applications. It is important to have such knowledge so as to develop effective courseware to be delivered to students. Teaching theory Robert Gagne is considered to be a major contributor to the design approach of teaching and training.

60.2.4 The Concept of Courseware

Education Resource Information Center (ERIC), USA, the courseware is defined as a comprised of computer software and additional documentation that is written specifically for instructional applications. Thus, courseware will also be defined as computer software that gives instructional material to students. Courseware may also be known as the computer Aided instruction (CAI) or computer Aided learning (CAL).

Courseware (online learning material) in other word is computer based learning, which refers to the use of computers for the conveying of instruction in an interactive mode which at this time are recognized as trend in supporting teaching process (Hei and Chien 2006). It is advisable that a precondition for effective web based courseware design in higher education is cautious consideration of the traditional body of knowledge in the field of instructional design which should serve as a basis for long term tendencies in the design process.

This body of knowledge consists of theories of instruction and courseware design aspects that concern hypermedia structure, learner control, feedback, interactivity, and screen design elements. Besides, the end-users' input have to be sought as it could make sure above and improve understanding on the implementation of the new medium of higher education (Monthienvichienchai and Melis 2005).

The views on computer assisted learning can be summarized as follows: Firstly, learning with online learning material is more successful compared to live lessons, secondly video simulation and the combination of graphic and audio presentation used in this will cause learning become easier, thirdly it is adjusted to students through various learning styles and fourthly it assists the review based on the approach to learning. Students can more focus on what information are being deliver compared to explanation from instructors. This is because they are difficult to capture or imagine the information that is being delivered.

60.2.5 Courseware Presentation

Presentation of learning material is very important as it could possibly strengthen learning or obstruct it (Mayer et al. 2001). The use of multimedia and interactivity elements where information is transferred in the form of integration of text, graphics, sound, animation and video can help a computer-based instructional activities attract a lot of attention. Since learners can study by themselves regardless of time and place. Students can use courseware to learn a subject matter according to their very own needs (Hei and Chien 2006).

Courseware presentation in computer-based learning activities may help attract a lot of attention of students in learning. The Nine instructional events are the perfect approach to teach a lesson. It utilizes all parts of testing, practice, and uses the information that is being presented. The uses of multimedia and interactive elements associate with the nine events of instruction that has been proposed by top researchers; Robert Gagne will help in developing an effective courseware.

Furthermore, with this multimedia elements will help the information transferred in the form of integration of text, graphics, sound, animation and video. It is also a useful learning tool because it allows students to participate and get involved with the courseware content. This can be done through interactive multimedia features that are built into content's instruction and obtain between the user and the personal computer. Therefore, to show the relation between Gagne's theory of nine events and courseware presentation, the hypothesis below was formulated;

H1: Gagne's theory of nine events is associated with courseware presentation

60.3 Methodology

This research was conducted to identify the effectiveness of courseware presentation using learning theory for a programming subject. Gagne's nine event of instructions leaning theory developed by Robert Gagne was chosen. The evaluation of courseware presentation is professed in the process of courseware development involving the use of multimedia elements and interactivity elements found in the application; text, graphic, color, audio, video and animation as mentioned in the Gagne learning theory.

In order to achieve the objectives, a purposive sampling method is selected. Questionnaires were distributed to 30 respondents that were identified as a control group that has been using the courseware were identified. The respondents comprised of first semester's students from the Faculty of Applied Sciences, UiTM Shah Alam that used the courseware for "Introduction to C++ Computer Programming" subject for 2 months. The students then evaluated the courseware presentation that they have used during teaching and learning process to quantify the effectiveness of

it with their studies. In completing the questionnaire, respondents were required to choose from a 5 point Likert scale and analyzed using Statistical Package for the Social Sciences (SPSS) software.

60.4 Findings

60.4.1 Cronbach's Alpha Test of Reliability

It is valuable to compute using Cronbach's Alpha as it delivers core constancy dependability for any scales or subscales (Gliem and Rosemary 2003). The reliability measurement is based on Sekaran (2003). If the scale is less than 0.6, it is considered as poor. Meanwhile, if the scale results in range of 0.6 to less than 0.7 will be moderate. Although, the scale result will be good and very good if the scale range in 0.7 to less than 0.8 and 0.8 to less than 0.9 respectively. The higher the reliability, it will in excellent consistency that is 0.9–1.0. The Cronbach's Alpha result for courseware presentation was 0.780 and associated as reliable and consistent.

60.4.2 The Effectiveness of Courseware Presentation

The hypothesis that will be tested was:

H1: Gagne's theory of nine events is associated with courseware presentation.

The result of Pearson Correlation Coefficient between Gagne's theory of nine events with courseware presentation indicated that r value=0.587** and P-value=0.001. From the result, there was a significant relationship between Gagne's theory of nine events with courseware presentation. The conclusion, the respondents showed positive attitude and attracted towards the new software presentation. Based on the analysis it shows that the majority of students agreed that the courseware presentation that is develop with Gagne's theory of nine events was effective and helpful in learning programming subject. Therefore the hypothesis of Gagne's theory of nine events is associated with courseware presentation is accepted.

60.5 Conclusion and Recommendation

Based on the research design and analyzed effects from this research, it can be concluded that the analysis results were consistent with the literature review, where the courseware presentation using learning theory for programming subject meet the requirements that support active learning and flexibility to improve the quality of

students and programming subject. Furthermore, the results also shown that the courseware produced was effective and met the needs of targeted users. It is expected that this study will fulfill the latest learning approach to enhance learning of students' acquisition in learning programming subject. Theoretically findings could be used to produce other courseware that can encourage students to become more attracted in learning other subjects taken at the Universiti Teknologi Mara or different universities.

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References

- Bouhnik, D., & Marcus, T. (2006). Interaction in distance-learning courses. *Journal of the American Society for Information Science and Technology*, 57(3), 299–305.
- Endut, A., Isa, P. M., Aziz, S. R. A., Jono, M. N. H. H., & Aziz, A. A. (2012). e-Learning for Universiti Teknologi MARA Malaysia (UiTM): Campus wide implementation and accomplishments. *Procedia – Social and Behavioral Sciences*, 67, 26–35. doi:10.1016/j.sbspro.2012.11.304.
- Gagne, R. M., Wager, W. W., Golas, K. C., Keller, J. M., & Russell, J. D. (1985). *Principles of instructional design*. Wiley Online Library.
- Gliem, J. A., & Rosemary R. G. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales*. Midwest research-to-practice conference in adult, continuing, and community education.
- Hei, C. W., & Chien, W. H. (2006). Teaching-Material Design Center: An ontology-based system for customizing reusable e-materials. *Computers & Education Journal*, 46(2006), 458–470.
- Holbert, K. E., & Karady, G. G. (2008). *Removing an unsupported statement in engineering education literature*. American Society for Engineering Education Pacific Southwest annual conference. Available at http://www.asee.org/activities/organizations/sections/proceedings/PacificSouthwest/2008/Holbert_Keith_et_al%20Unsupoprted%20Statement%20in%20Engineering%20Education.pdf. Accessed 10 July 2008.
- Jono, M. N. H. H., Hasanordin, R., Ibrahim, M., Asarani, N. A. M., & Aziz, A. A. (2013). E-materials application presentation using gagne learning theory for “Introduction to C++ computer programming”.
- Kruse, K. (2002), *The benefits and drawbacks of e-learning* (<http://e-learningguru.com>).
- Liaw, S.-S., Huang, H.-M., & Chen, G.-D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49(4), 1066–1080.
- Mayer, R. E. (2003). The promise of multimedia learning: Using the same instructional design methods across different media. *Learning and Instruction*, 13(2003), 125–139.
- Mayer, R. E., Heiser, J., & Lonn, S. (2001). Cognitive constraints on multimedia learning: When presenting more material results in less understanding. *Journal of Educational Psychology*, 93, 187–198.
- Mohd Nor Hajar Hasrol & Mohd Nor Mamat. (2007). *Effective teaching and learning through electronic course content development: A UiTM model* (Seminar Paper). Shah Alam: UiTM International Conference on e-Learning (UiCEL2007). UiTM.
- Monthienvichienchai, R., & Melis, E. (2005). *Implementing courseware to support learning through real-world erroneous examples: Students' perceptions of tertiary courseware and obstacles to implementing effective delivery through vle*. Paper presented at the proceedings of European conference on eLearning (ECEL-2005).

- Nandigam, D., & Bathula, H. (2013). Competing dichotomies in teaching computer programming to beginner-students. *American Journal of Educational Research*, *1*(8), 307–312. doi:10.12691/education-1-8-7.
- Neo, M., & Neo, T. (2008). *Students' perceptions of interactive multimedia mediated web-based learning : A Malaysian perspective* (1995) (pp. 658–666).
- Neo, T., Neo, M., & Teoh, B. S. (2010, January). *Assessing the effects of using Gane's events of instructions in a multimedia student-centred environment* (pp. 20–34). A Malaysian experience.
- Neo, M., Neo, T., & Yap, W. (2011). *Students' perceptions of interactive multimedia mediated web-based learning: A Malaysian perspective*. Paper presented at the Ascilite 2008 conference, Melbourne.
- Norasayikin Zaid & Zaidatun Tasir. (2011). *Penggunaan teknik penyelesaian masalah dalam pembangunan aturcara komputer bagi pelajar pendidikan*. Sources from <http://eprints.utm.my/14082>
- Raab, F. H. et al. (2002). Power amplifiers and transmitters for RF and microwave. Microwave theory and techniques. *IEEE Transactions*, *50*(3): 814–826.
- Robins, A., Rountree, J., & Rountree, N. (2003). Learning and teaching programming: A review and discussion. *Computer Science Education*, *13*(2), 137–172. doi:10.1076/csed.13.2.137.14200.
- Rosenberg, M. (2001). *E-Learning: Strategies for delivering knowledge in the digital age*. New York: McGraw-Hill.
- Sekaran, S. et al. (2003). Calcium imaging reveals a network of intrinsically light-sensitive inner-retinal neurons. *Current Biology*, *13*(15): 1290–1298.
- Sekaran, U. (2005). *Research methods for business: A skill building approach* (4th ed.). United States of America: Wiley, Islamabad.
- Shotsberger, P. G. (2000). The human touch: Synchronous communication in web-based learning. *Educational Technology*, *40*(1), 53–56.
- Teague, D., & Roe, P. (2008, January). Collaborative learning: towards a solution for novice programmers. In *Proceedings of the tenth conference on Australasian computing education*. (Vol. 78, pp. 147–153). Australian Computer Society, Inc.
- Tennyson, R. D. (2010). Historical reflection on learning theories and instructional design. *Contemporary Educational Technology*, *1* (1), 1–16. [ELECTRONIC VERSION]. Retrieved on May 15, 2011 from <http://cedtech.net/articles/11/111.pdf>
- Thomas, P. Y. (2010). Towards developing a web-based blended learning environment at the University of Botswana. In I. Ismail, M. Ismail, F. Hanis, & A. Razak (Ed.), *A website analysis on the use of multimedia elements for Islamic history content. KSII the 5th International Conference on Internet (ICONI), Pattaya, Thailand 2013*.
- Zhang, D., & Nunamaker, J. F. (2003). Powering e-Learning in the new millennium: An overview of e-Learning and enabling technology. *Information Systems Frontier*, *5*(2), 207–218.

Chapter 61

Student Readiness of a Newly-Designed Blended Learning English Language Proficiency Course in UiTM

Nur Fatima Wahida Mohd Nasir and Izaham Shah Ismail

Abstract In the field of education, technology has developed vastly in becoming one of the main mediums of instruction in schools, institutions or even training programmes. Educators from all over the world are now looking up into new implementations in replacing the old conventional way of teaching to enhance a better learning environment among students in this era of globalization. Special attention is now focusing into what is known as a combination of e-learning and face to face learning (F2F) called blended learning. This paper conducts a study among 156 Diploma undergraduates of the Universiti of Teknologi MARA (UiTM) Shah Alam, Malaysia which aims to investigate on students' readiness in a newly-designed blended learning English language proficiency course under the Academy of Language Studies (ALS). Correlation between students' readiness and their enjoyment going through the new course is also being investigated. Findings indicate that Diploma students of *UiTM Shah Alam* exhibit above-medium levels of readiness toward blended learning and that there is a negative correlation between students' readiness with their enjoyment going to ELC classes. Further recommendations of the research are also discussed in the study.

Keywords Blended learning • Student readiness

N.F.W.M. Nasir (✉)

Academy of Language Studies, Universiti Teknologi MARA (Perak),
Seri Iskandar, Bandar Baru Seri Iskandar, 32610 Perak, Malaysia
e-mail: nurfa269@perak.uitm.edu.my

I.S. Ismail

Faculty of Education, Universiti Teknologi MARA,
Section 17 Campus, 40200 Shah Alam, Selangor, Malaysia
e-mail: izaha740@salam.uitm.edu.my

61.1 Introduction

61.1.1 *Blended Learning*

Recently there has been a number of empirical research investigating in the area of blended learning. The topic has become a major concern, especially in the field of education where teachers, lecturers and instructors question, argue, discuss and experiment on the positive and negative outcomes it may influence teaching and learning environments. Even the term 'blended learning' itself has always been a constant issue to what it actually means (Twigg 2003). Upon agreement from many researchers, blended learning can be defined as an effective integration of different modes of delivery, teaching and learning styles. Different methods and style of teaching have its own strengths and weaknesses. Although it seems that the implementation of blended learning has its challenges, weaknesses and risks either from institutions in Malaysia or from other countries, the basic concept still stands as a strong source of instructional method among many more researchers who believe in the imperativeness of students to adapt with the fast pace of technology. According to a study, blended learning is a resourceful methodology that can prop and augment meaningful educational experiences (Twigg 2003; Garrison and Kanuka 2004).

Through much research it can be considered that blended learning may provide a number of benefits whether in the area of education, business or even under the corporate industry which includes; greater access to a range of appropriate, personalized and individualized learning and teaching resources, greater accommodation and convenience, greater flexibility, cost effectiveness and affordability, greater student and faculty satisfaction, help allay feelings of isolation, anxiety and frustration among learners, encourage participation in class, enhance learning process, improve pedagogical richness of face to face teaching and e-learning, broader opportunities, utilize computer aided assessments and technological adoption, as well as encourage and motivate students through interactive collaboration (Boyle et al. 2003; Dufy and Kirkley 2004; Moore 2004; Bonk and Graham 2006; Sharpe et al. 2006; Sharma and Barrett 2007; Stracke 2007; Joachim and Petra 2008; Bath and Bourke 2010; Horn and Staker 2011). Taken together, this final group of assertions support the view that a blended learning system can provide strong positive implications to students' learning environment.

Although even up until now, the majority of foreign language teaching and learning is still largely conducted towards F2F learning in classrooms, there is a rapid growth in the use of technology which provides language teachers and students with more opportunity in exploring the most suitable mix of teaching and learning styles for a given tasks. It is believed that with the combination of both F2F learning and web-based technology, students of language learning can gain more benefit and experience a more quality education.

Furthermore, it is also proven that with the use of a blended learning environment, this can create opportunities for learners in overcoming the problem of applying the language not only in class but also outside of class since blended learning

focuses on the attempt to encourage and develop independent learning or known as 'autonomy learning'. As stated from Motteram and Sharma (2009), cited from Barrs (2011), with the usage of interactive, communicative and collaborative platforms such as the email, instant messaging, wikis, blogs, forums, social-networking sites and virtual learning environments, students learning a foreign language are able to overcome the disconnection of applying the language outside the classroom. The implementation of blended learning may also help teachers and students in overcoming the major problem of time constraints.

61.1.2 Student Readiness

The concept of student readiness in an online environment was introduced by Australian researchers in 1998 known as Warner, Christie and Chow whom defined it into three categories; students' preferences for the form of delivery as opposed to face-to-face classroom instructions; student confidence in using electronic communication for learning and, in particular students' ability in the use of Internet and computer-mediated communication; and also the ability to engage in autonomous learning (Hung et al. 2010). Subsequently, more and more researchers around the world begun to further develop extensive and intensive theories on student readiness in the blended learning environment. In 2010, researchers Hung, Chou, Chen and Own developed and validated a latest multidimensional instrument for college students' readiness on online learning known as the Online Learning Readiness Scale (OLRS) that was categorized into five dimensions including; self-directed learning, motivation for learning, computer/Internet self-efficacy, learner control, and online communication self-efficacy. Student readiness can be separated into two components, which are technical readiness and self-directed readiness.

Technical readiness and self directed readiness refers to schema, attitudes, pre-requisite skills and habits in Information Communication Technology (ICT) components while attitude is the central of components in self directed learning readiness that comprises of acceptance of responsibilities for one's own learning, creativity and independence in learning, a willingness to seek help and valuing one's own learning (Norshima et al. 2013). As validity and reliability were tested in the study, this model was also adopted and adapted as a conceptual framework basis for this particular research.

61.1.3 Academy of Language Studies, UiTM

In the Universiti of Teknologi MARA, the Department of English and Linguistics is the largest department in the Academy and caters all English language needs of the University. For Diploma levels, APB provide courses such as; Consolidating Language Skills (BEL 120); Communication Skills (BEL 130); Preparatory Course

for MUET (BEL 260); English for Academic Purposes (BEL 311); as well as English for Occupational Purposes (BEL 312). Coming into the new millennium, Malaysia's former Ministry of Higher Education urged Universities across the country to focus more on the fundamentals of life-long education as well as the need of ICT in higher education under the 9th Malaysian Plan (cited in Chai and Poh 2009) from Farahiza (2010).

UiTM also strives its best in fully utilizing every technology provided within the medium of instruction. With the inspiration to develop UiTM in becoming a distinguished and international standard university, the implementation of blended learning was established in 2009 under the collaboration between the Academic Affairs Division and i-Learn Centre. The programme involves both students and lecturers which is also aimed to reduce problems of space constraints in face to face learning environment.

Two models were developed under this programme including Model A and Model B which differentiates according to lessons being learnt in a specific week. For example Model A provides a combination of a 2 h face to face learning with a 2 h e-learning in one whole week while Model B is also a combination of both, but conducted through a 4 h face to face learning in 1 week and another 4 h fully online learning in a different week. However, the distribution of hours is optional in UiTM whether it may be under the ratio of 50:50, 60:40, or 70:30. In addition, extension of tutorial sessions which are entirely based on e-learning is also being encouraged in the institution (Blended Learning for Lecturers, Students and Admin Guideline of UiTM 2009).

Based on these models, the Academy of Language Studies developed a new English course named as "Integrated Language Skills" (ELC) replacing BEL 120, BEL 260 as well as BEL 311 which has been launched for only one semester. Unlike before where the previous course combined all the four components of English namely listening, reading, writing and speaking, this new course focuses on only one particular skill for one semester. Semester one (1) focuses on the skill of listening; semester two (2) focuses on the skill of speaking; semester three (3) focuses on reading; and semester four (4) focuses on writing.

Although ELC remains a three hour credit, the new course includes a three hour face to face session per week and an addition of three and a half hours for e-learning in which students must complete certain individual and group-work tasks. Since the design of ELC requires students to participate more actively during class and also during non face to face sessions, it is greatly important that students motivate themselves in adopting with different learner strategies in order to be able to keep in pace with the new course.

61.2 Statement of the Problem

It is important to understand that in order to discover the effectiveness of a particular blended learning course, there are numerous ways for a researcher to look into. Based on studies carried out by Huey et al. (2007) and Hung et al. (2010) their

research as well as other numerous foreign and local research have indicated that the effectiveness of blended learning is attached closely with students' behaviour which can be predicted through students' readiness of learning. Although in UiTM itself, literature shows that there are a number of research done that looks into student readiness (Norshima et al. 2013; Lai and Chong 2007; Chow et al. 2007; Junaidah 2007) no study has actually been conducted to investigate student readiness under UiTM's new English course, ELC which was launched on March 2014.

Therefore, as new innovations of blended learning modes are continuously being examined across the globe, it is vital that an investigation on student readiness should also be conducted upon this newly-designed blended learning English Language Proficiency course under the Academy of Language Studies (ALS) of the University of Technology MARA (UiTM). Due to these deficiencies, it is prominently clear that there is a need to extend further research in the field of blended learning so that researchers and especially educators are able to identify the best practice or model that can be implemented under a blended learning system.

The result of the study is believed to be beneficial for many parties especially in the field of education where the knowledge of different language-based blended learning models can be extended and also for the future advantage of the Academy of Language Studies (ALS) as well as for the UniversitiTeknologi MARA as a whole.

61.3 Research Questions

Research questions that will be investigated in this study include:

1. Are Diploma students of UiTM Shah Alam ready in this newly-designed blended learning course?
2. How do students' enjoyment going to ELC classes correlate with their readiness of the new course?

61.4 Research Design

As qualitative and quantitative approaches were conducted, the main research design in this study is regarded as a mix methods design. As the main aim of this study is to investigate students' readiness in blended learning for ELC, the quantitative approach will provide the breadth in the findings and the qualitative approach will provide depth in understanding the phenomenon under scrutiny. In this study qualitative design comprise of a 10 % interview session with the students while quantitative design includes Descriptive Surveys looking at the average score of students' readiness and Correlation Coefficient which looks at the relationship between students' readiness and students' enjoyment going to ELC classes.

61.5 Sample

The total number of UiTM, Shah Alam students is approximately 47,000 which comprise of various faculties and programmes. Sampling in this research however involves a population of 289 Diploma students. According to Krejcie and Morgan (1970) the appropriate number of respondents from a population of 280 is 160. Therefore, as means of reliability, the number of respondents from this study is 156 students ranging from 19 to 23 years old. These students are Diploma undergraduates from the Faculty of Art Design and the Faculty of Sport Sciences, mostly comprised of Malay students or *Bumiputras* (indigenous) from semester one (1) and two (2) which were chosen through a purposive sampling technique. Reasons for choosing Art and Design as well as Sport Sciences students is because they consists of the of the largest number among all Diploma programmes in UiTM, Shah Alam compared to other minor programmes such as Business Management and Accountancy which only had not more than 30 students.

61.6 Data Collection

Two (2) methods were applied in the process of collecting data in this particular research; First – distribution of questionnaires and second – interview sessions. For the first process, distribution of questionnaires was conducted in UiTM, Shah Alam's main hall, Dewan Agung Tuanku Canselor (DATC). Among 230 students, only 156 questionnaires were retrieved and a number of 15 students were willing to participate in the interview session. The interview session was also conducted in DATC which was done right after all the questionnaires were obtained.

61.7 Instrumentation

In this research, the main instrumentation used is through questionnaires based on a research of Hung et al. (2010) who conducted a study in investigating the most reliable and valid system that measures student readiness in the blended learning context called The Online Learning Readiness Scale (OLRS). In addressing terms of reliability and validity, the researchers used a confirmatory factor analysis (CFA) to evaluate the hypothetical model of the study which resulted into categorization of five dimensions including; self-directed learning (0.871), motivation for learning (0.843), computer/Internet self-efficacy (0.736), learner control (0.727), and online communication self-efficacy (0.867). As the OLRS measurement model of student readiness composites a reliability of more than 0.7, the model is considered as an acceptable value for reliable construct (Fornell and Lacker 1981).

The questionnaire was divided into four sections including; Part A, Part B, Part C, and Part D. Part A requires the respondents' demographic data; Part B includes three subjective questions where participants are able to explain certain reasons to their answers; Part C includes a number of 36, 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agrees) on their readiness of a blended learning environment in ELC; and Part D provides a list of six options for participants to tick on their opinion that leads to a successful blended learning environment. Furthermore, 10 % of the respondents were randomly chosen to be interviewed.

61.8 Data Analysis

Data in the study is analyzed using inferential statistics which allow researchers to make inferences from the sample. The main statistical tool that is used in the study is descriptive analysis which is conducted to investigate the average score of students' readiness. Besides that, the study also uses a correlation technique.

Moreover, data from the interview sessions were tapped, transcribed and categorized into two categories which are; students who preferred blended learning in an English class; and students who preferred face to face learning in an English class.

61.9 Findings & Discussion

61.9.1 Are Diploma Students of UiTM Shah Alam Ready in This Newly-Designed Blended Learning Course?

From the table below, the mean score for Students Readiness is 3.9144. According to the designer of the OLRs model, a mean score that ranges from 3.60 to 4.37 indicates that students exhibit above-medium levels of readiness (Hung et al. 2010). As the mean score for Art and Design as well as Sport Sciences Diploma students in UiTM, Shah Alam ranges from 3.60 to 4.37, it can be concluded that these particular students exhibit above-medium levels of readiness in the ELC course.

The average score of student readiness is 3.9722 indicating that Diploma students of Art and Design as well as Sport Sciences of UiTM, Shah Alam exhibit above-medium levels of readiness in ELC which is believed to be related with students' good computer skill knowledge as well as feeling of comfort in using technology and browsing the internet. This conclusion is also derived from the interview session which showed that all of the students did not mention anything on the difficulties of using computers or soft-ware during ELC classes but was more to difficulties in completion of tasks. Therefore, this research supports the view from Purcell et al. (2013) which claims that students nowadays should be introduced with more combination of online learning and traditional classes because they are

Table 61.1 Student readiness average

	Average score
Mean	3.9144
Median	3.9722
Std. Deviation	.52343
Skewness	-.229
Total	156

Table 61.2 Correlations between readiness and enjoyment in ELC classes

		Do you enjoy going to ELC classes?	Student readiness average score
Pearson correlation	Do you enjoy going to ELC classes?	1	-.165*
	Student readiness average score	-.165 ^a	1
Sig. (2 tailed)	Do you enjoy going to ELC classes?		.040
	Student readiness average score	0.40	
N	Do you enjoy going to ELC classes?	156	156
	Student readiness average score	156	156

*Correlation is significant at the 0.05 level (2-tailed)

familiar with technology since they were born. Findings from Purcell et al. (2013) shows that 67 % of students from the United States are comfortable using technology and the 85 % of them use it daily (Table 61.1).

61.9.2 How Do Students’ Enjoyment Going to ELC Classes Correlate with Their Readiness of the New Course?

Data shows that there is a weak negative correlation between enjoyment of going to ELC classes with students readiness in the course ($r = -.165$, $p\text{-value} = .040$) which implies that students who enjoyed going to ELC classes reported lower student readiness of the new course (Table 61.2).

The study finds out an interesting discovery that although there was a high percentage of students who believed that technology would increase motivation, data shows that there is a weak negative correlation between enjoyment of going to ELC classes with students readiness in the course ($r = -.165$, $p\text{-value} = .040$). This simply means that students who enjoyed going to ELC classes reported lower student readi-

ness of the new course ($M=3.9722$). This finding however is seemed to be unparallel with the theory that the more students enjoy a blended learning environment, the more they are expected to be ready.

Fortunately, this circumstance can be explained through the 10 % sample of students who interviewed in the study. When asked about the students' experiences completing the online assignments in ELC, findings show that a majority of the students from this group did feel nervous or unconfident for several reasons.

Although all of the students from this group agreed that blended learning is preferable for an English class, one particular student mentioned that the reason she felt unconfident in doing the online assignments was her concern that it may affect her CGPA while another student clearly explained that the nervousness comes only when the task was thought to be too challenging and nothing to do with the other daily activities. This can be understood that the factor which made students enjoy going to ELC classes was primarily for other reasons that did not relate with online tasks.

Findings from the interview also discovered that students who liked going to ELC classes had higher expectations of themselves and that the challenge in online tasks made them worried and sometimes unconfident if they were not able to meet these expectations. The study therefore concludes that there is a high probability that the ELC online assignments might be too difficult for the Diploma students' level and that it should be re-examined to avoid from future complications of the new blended learning design.

This situation clearly highlights Marsh's (2012) research who stated that because pushing up motivation is also perceived as a great challenge in language learning, it is essential to have the right level of motivation in a language class because if an instructor gives a task which is too easy, it is unlikely for the students to improve while if they tasks given are too difficult, this might cause students to give up easily and furthermore if students are given tasks that do not interest them, this would fail to motivate the students at all.

61.10 Implications

The results of the study reveal that students' readiness of certain blended learning environments can be closely connected with their relationships with the instructors. Therefore, the study suggests that teachers, lecturers or instructors of a blended learning class must not only focus on the tasks given to students but must also look into aspects of the learners itself, for example; things or subjects that interests the learners; things that can motivate them; subjects that are closely connected with them or life experiences that they can share with their friends.

This way, as students develop the knowledge of managing to become more organized in a blended learning environment they also become more interested in participating in class. Practicing these activities in a blended learning class before giving the students their main tasks is believed to be able to reduce anxiety as well

as encouraging students to develop a close relationship with their instructors. At the same time, these friendly activities also allow lectures to get to know more of the students' strengths and weakness in a blended learning English language proficiency course.

Apart from that, the study also reveals the importance of a lecturers' role in inculcating constant motivation among students. According to Lai (2011) in this technological era, extrinsic motivation is considered as a vital element in increasing motivation in a classroom which is governed by reinforcement contingencies where it involves constellation of closely related beliefs, perceptions, values, interests and actions. The study suggests that as instructors, it is significant that reminders of positive words should constantly be articulated to the students so that they are always in a positive mind and attitude, especially in a blended learning environment where students need to step out of their comfort zone.

61.11 Future Recommendations

It is vital that further research should be done to investigate effective teaching instructions in a blended learning environment which can lessen student's anxiety as well as an intensive investigation in improving tasks distribution in the online ELC courses which should also focus to lessen anxiety among students. Based on this study, it is believed that tasks which are too difficult could lead to anxiety in a blended learning environment and that ineffective teaching instructions could cause to lack of motivation from students.

Effective teaching instructions include minor tasks and activities that can be conducted in a blended learning class in order to encourage students to become more confident. On the other hand, tasks distribution in a blended learning environment should focus on aspects which can be too difficult for different learners' prior knowledge in technology. Therefore, future research should look into different levels of blended learning tasks for different levels of students.

61.12 Conclusion

The main investigation of this study is to find out whether Diploma students of Art and Design as well as Sport Sciences in UiTM, Shah Alam are ready in learning the newly-designed blended learning English language proficiency course, called ELC. The study also investigates whether there are differences among different gender, courses and semesters as well as seeking out on the relationship between students' enjoyment going to ELC classes with their readiness of the new course and the relationship between students' perception of technology as tool for increasing motivation in learning with their enjoyment going to ELC classes.

Based on evidence from the findings, it can be concluded that Diploma students form semester one and two, Art and Design programmes as well as Sport Sciences programmes' attitude and readiness of this particular newly-designed blended learning English language proficiency course is mainly affected by the students' attitudes and belief of instruction in the course with less impinge on the design, technological tools, content, management or infrastructure of ELC. This discovery can be connected with other empirical research findings that the effectiveness of a blended learning environment is attached closely with students' behaviour which can be predicted through students' readiness of learning (Huey et al. 2007). That is why according to Brophy (2010) in blended learning, students' motivation is strongly believed to be related to intrinsic motivation which is connected with students' thoughts, beliefs, goals and situated dynamic relationships between students and the environment.

In this case, intrinsic motivation was found to be largely due to students' relationship with the instructors as supported from evidence from statistical analysis as well as interview sessions. It seems that the main reason students liked going to ELC classes was because of their fondness of the instructors' teaching style as well as the instructors' attitudes towards the students. Readiness in the ELC course was also linked to students' goal to do the best in class so that they would impress the lecturer and so that they would achieve good grades in their CGPA. When it comes to difficulties in completing the tasks in ELC, students seem to become more confident and comfortable only with the guidance and support of their lecturers, regardless if they are taking Listening Skills in semester one or Reading Skills in semester two. Without motivation from the lecturers, students become nervous, embarrassed and de-motivated in going through the learning process.

References

- Barrs, K. (2011). Mobility in learning: The feasibility of encouraging language learning of smart phones. *Studies in Self-Access Learning Journal*, 2(3), 228–233.
- Bonk, C., & Graham, C. (2006). *Handbook of blended learning*. San Francisco: Jossey-Bass.
- Boyle, T., Bradley, C., Chalk, P., Jones, R., & Pickard, P. (2003). Using blended learning to improve student success in learning to program. *Journal of Educational Media*, 28(2–3), 165–178.
- Brophy, J. (2010). *Motivating students to learn*. New York: Taylor.
- Chai, L. G., & Poh, Y. N. (2009). E-learning in Malaysia: Success factors in implementing E learning program. *International Journal of Teaching and Learning in Higher Education*, 20(2), 237–246.
- Duffy, T., M., & Kirkley, J. R. (2004). *Learning theory and pedagogy applied in distance learning: The case of Cardean University*. London: Lawrence Erlbaum Associates, Lawrence Elbaum.
- Farahiza, Z. A. (2010). Blended learning in higher education institution in Malaysia. Retrieved April 6, 2013, from http://library.oum.edu.my/oumlib/sites/dfault/files/file_attachments/odlresources/4334/blended-learning.pdf
- Fraenkel, J. R., & Wallen, N. E. (2000). *How to design & evaluate research in education* (4th ed.). New York: McGraw-Hill Companies.

- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *Internet & Higher Education*, 7, 95–105.
- Huey, C. S., Foong, N. S., & Salwah, C. M. (2007). *A survey on student acceptance of e-learning at UiTM, Pulau Pinang*. Shah Alam: Institute of Research Development and Commercialisation (IRDC), UiTM.
- Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perception. *Journal of Elsevier, Computers & Education*, 55, 1080–1090.
- Bath, D., & Bourke, J. (2010). *Getting started with blended learning*. Australia: Griffith Institute for Higher Education.
- i-Learn Centre, UiTM. (2009) Blended learning for lecturers, students and admin guideline*. i-learn Centre, HEA. UiTM Shah Alam.
- Joachim, H., & Petra, R. (2008). *Guide on development and implementation of blended learning*. Wales: Pontydysgu.
- Junaidah Hashim. (2007). Religion as a determinant in self-directed learning at the workplace. In *Proceeding of the 2007 international conference on management from Islamic perspective*. Hilton, Kuala Lumpur.
- Krause, K. (2007). E-learning and the e-generation: The changing face of higher education in the 21st century. In J. Lockard & M. Pegrum (Eds.), *Brave new classrooms: Educational democracy and the internet* (pp. 125–140). New York: Peter Lang.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Journal of Educational and Psychological Measurement*, 30, 607–610.
- Lai, E. R. (2011). *Motivation: A literature review*. Retrieved June 2, 2013, from <http://www.personassessments.com/research>
- Lai, M. L., & Chong, M. M. (2007). Professional students' technology readiness, prior computing experience and acceptance of an e-learning system. *Malaysian Accounting Review*, 6(1), 85–99.
- Marsh, D. (2012). *Blended learning creating learning opportunities for language learners*. Cambridge: Cambridge University Press.
- Ministry of Education Malaysia. (2003). *Educational development plan 2001–2010*. Kuala Lumpur: Ministry of Education Malaysia.
- Moore, M. G. (2004). Research worth publishing. *American Journal of Distance Education*, 18(3), 127–130.
- Norshima Humaidi, Mohammad SyazwanMohd, Nor Azilah Mohd Asarani, & AnnurizalAnnuar. (2013). *Students performance on the implementation of online learning system*. Centre of Applied Management, Faculty of Business & Management. UiTM, Malaysia.
- Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013). *How teachers are using technology at home and in their classrooms*. Washington, DC: National Writing Project.
- Sharma, P., & Barrett, B. (2007). *Blended learning*. Oxford: Macmillan.
- Sharpe, R., Benfield, G., Roberts, G., & Francis, R., (2006). *The undergraduate experienced of blended e-learning: A review of UK literature and practice*. The Higher Education Academy.
- Staker, H., & Horn, M. B. (2011). *The rise of K-12 blended learning*. New York: McGraw-Hill.
- Stracke, E. (2007). *Conflicting voices: Blended learning in a German university foreign language classroom*. Dublin: Eine Festschrift für Bernd Voss.
- Twigg, C. (2003). Improving learning and reducing costs: new models for online learning. *EDUCAUSE Review*, 38(Sept./Oct), 28–38.

Chapter 62

Can Technology Make a Difference for Shy Undergraduates?

Zuraidah Ali

Abstract With so much effort to understand Generation Y and the current trend in today's education scenario, this paper posits that technology shall continue to be necessary in developing the minds, abilities and confidence among our students, particularly the undergraduate cohort taking Public Speaking course. For this purpose, a survey research was conducted with a group of undergraduates pursuing Foundation Studies in Information Technology at Universiti Tenaga Nasional (UNITEN). Included in the survey were a package of self-designed questionnaire on English as a Second Language (ESL) academic blogging, self-report on personality description, and an established scale to measure public speaking anxiety, PRPSA. Results indicate a significant difference among the PRPSA groups with attitude toward academic blogging. Further, there was a significant difference between self-reported shyness and the academic blogging pattern. The study concludes that academic blogging technology as a tool in ESL teaching practice could help undergraduates overcome shyness in expressing their opinions and communicating with the rest of the world.

Keywords ESL • Public speaking • Technology in ESL • Shyness • University education

62.1 Introduction

Transfusion of technology in tertiary classrooms is apt and quintessential considering the challenging curriculum expectations as well as the characteristics of the current undergraduate audience. The use of technology can benefit both teachers and learners in myriad ways, particularly for English as a Second Language

Z. Ali (✉)

College of Foundation and General Studies, Universiti Tenaga Nasional,
KM 7, Jalan IKRAM-UNITEN, 43000 Kajang, Selangor, Malaysia
e-mail: zue@uniten.edu.my

(henceforth ESL). In other words, technology has created a new trend in our education climate surpassing all levels of education.

This study was conducted in Malaysia, a developing country in the Southeast Asia region. It is fast developing and owes its numerous accomplishments to the incorporation of technology. At present, Malaysia is serious in developing a consistent pattern of incorporating technology in education. As manifested in its past and existing strategic plans, the country has invested on E-learning (6th Malaysian Plan), smart school projects (7th Malaysian Plan) as well as ICT Education Hub (9th Malaysian Plan). Besides ICT implementation plans at school level, there have been interesting and promising research works with regard to the use of technology among undergraduates as well as its applications in the university courses (Nair and Paramasivam 2004; Ros et al. 2009; Zakaria et al. 2010; Kanniah and Krish 2010).

This study will focus the discussion on the use of technology for tertiary education, with particular interest on utilizing technology as a tool for ESL class via the ESL Blogosphere. It will configure the possibility of using technology to address shyness syndrome in ESL classrooms, a common daunting phenomenon in the national setting.

62.2 Literature Review

Understanding how learners behave in ESL classrooms is significant to promote a more conducive and active learning climate. Studies based in the Malaysian setting have reported several common reasons attributed to learners' lack of participation and reticence. Some relate closely to the socio-cultural perspective like respect for the elderly and maxim of modesty (Raja Nor Safinas 2009). Other reasons include affective and emotional domains i.e. lack of confidence, feeling of insecurity, and shyness (Bahiyah 1992; Raja Nor Safinas 2009; Zuraidah 2011, 2014). Habibah et al. (2005) reported that students with low proficiency in English tend to develop anxiety and confront speaking situations with shyness and much discomfort.

Indeed, ESL learners manifest an array of behaviours that require attention and further research. Amidst this tapestry, this paper will focus on one common problem in ESL classrooms particularly among Malaysian ESL learners: shyness.

In this era of technology, can ESL practitioners win this battle against shyness syndrome? Until today, the use of ICT in ESL has been widespread and convincing. Davies (2007) reported three broad benefits of incorporating ICT in English classrooms. This includes cognitive gain where the use of software enhances learners' visualisation process, motivational gain as well as interactional gain. Kanniah and Krish (2010) demonstrated that the use of weblog as a form of ICT in education promotes information-sharing and encourages active participation in the virtual mode.

Zakaria et al. (2010) conducted a survey research at University Teknikal Malaysia Melaka to elicit undergraduate feedback and perception on the use of Web2.0 for

learning. They reported that the undergraduates are reasonably well-exposed to Web2.0 applications and feel comfortable using them for learning purposes.

Further, Minges and Grey produced a report on ICT in Malaysia in 2002. It was one of a series of case studies examining internet use and applications in South East Asia. They have noted that since 1990, all primary and secondary school teachers have been obliged to 'take basic informatics courses in teachers' college and the Ministry of Education (MOE) also offers intensive IT courses'. The Ministry of education has formulated three main policies for ICT education: (1) ICT for all students; (2) ICT as a teaching and learning tool; (3) ICT to increase productivity, efficiency and effectiveness of the management system. The government policy and the wide applications of ICT at schools prepare students for the ICT challenge at pre-university and university levels of education. In other words, with the current trend of ICT in education in Malaysia, university courses should be able to effectively use ICT as a teaching and learning tool.

This paper positions its concerns within the ICT supportive learning environment. It investigates how ICT via ESL Blogosphere could contribute to solving a perplexing phenomenon in the Malaysian ESL classroom setting: the shyness syndrome. 'Shyness' refers to nervousness, anxiety and some even relate it to communication apprehension.

In this study, 'shyness' is discussed within the context of public speaking; hence; it is a trait that is seen as manifestation of public speaking nervousness and public speaking anxiety. Is this common? Definitely, and this is supported by McCroskey (1998), "If public speaking makes you nervous, then you are not alone. As many as 75 % of college students have reported having anxiety about public speaking".

62.3 Materials and Methods

The study employed the survey research methodology. A total of 39 students from two English classes at UNITEN were invited to give their response to the structured questionnaire.

62.3.1 Respondents

This study was conducted among a cohort of 39 Foundation students in Information Technology taking Public Speaking course with the author. The course is compulsory to all Foundation students at the university. It is designed to suit the needs of learners with little or no background in Public Speaking and develop the potential of public speaking talent among those with some experience in competitions. The age of the participants is 17–19. Participation was strictly voluntary. The volunteers were informed that the results of their survey would remain anonymous, not affecting their academic results in any way. Considering the nature of the research, the

respondents agreed to reflect on their engagement with the ESL Blogosphere, an academic blog which is introduced by the author as a teaching and learning technological intervention. In other words, the respondents are familiar with the concept of academic blogging via <http://speakup-avenue.blogspot.com>.

62.3.2 Measures

Three self-report measures were administered to all respondents. They are (1) demographic and shyness profile (2) academic blog questionnaire (3) Personal Report of Public Speaking Anxiety (PRPSA) which focuses strictly on public speaking anxiety (McCroskey 1970). The demographic and shyness profile was most importantly used to elicit self-report on shyness. The academic blog questionnaire (reliability test at $\alpha=0.784$) is self-designed to evaluate the use of academic blogs in ESL classrooms. It has a total of 21 items. There are 10 items for part A and 11 items for part B. The PRPSA is highly reliable instrument (α estimates $>.90$) developed by Professor James McCroskey. It has a total of 34 items measuring public speaking anxiety. Scores above 131 indicate high anxiety; scores between 98 and 131 indicate moderate anxiety; and scores below 98 indicate low anxiety.

62.3.3 Research Questions

The study was carried out to answer the following research questions:

1. Is there a significant difference between 'shy' and 'not shy' learners with regard to acceptance of academic blogging?
2. Is there a significant difference between the PRPSA groups with their attitude toward academic blogging?

62.4 Results and Discussion

Based on the t-test analysis on factor A and B with shy students, only factors grouped as A.1 have a significant difference at $\alpha=0.1$ (Table 62.1) There are three items in factor A.1 (*item 1 = I usually read blogs in English, item 5 = When appropriate, I write comments on the blogs that I visit, item 6 = I'm interested in following blogs that promote discussions on topics, issues, interests*).

As illustrated in Table 62.2 below, findings show interesting interpretation of the undergraduate cohort. 51.28 % (N=20) of the respondents who claimed to be shy reported that they usually read blogs in English. In contrast, only 17.95 % (N=7) of the 'not shy' respondents read blogs in English. Hence, if ESL practitioners

Table 6.2.1 T-test of factors A and B for shy students

		Sum of squares	df	Mean square	F	Sig.
Factor_A.1	Between groups	2.229	1	2.229	4.299	0.046**
*Shy	Within groups	17.632	34	.519		
	Total	19.861	35			

*Significant at the $\alpha=0.01$

**Significant at the $\alpha=0.05$

Table 6.2.2 Crosstabs between *shy students with factor A.1 (items A5, A6 and A1)*

Factor vs shy not shy	Item 5		Item 6		Item 1	
	Not shy	Shy	Not shy	Shy	Not shy	Shy
Strongly agree	9	8	6	11	3	10
Agree	4	14	7	10	4	10
Not sure	1	1	2	2	2	1
Disagree	1	0	0	0	5	0
Strongly disagree	1	0	1	0	1	0
Total	16	23	16	23	15	21

were targeting for shy learners to accept the incorporation of technology via ESL blogosphere, this result is promising and could motivate proliferation of more ESL blogs to be used in the classrooms.

Further, results indicate higher interest and engagement in following blogs that promote discussions among the ‘shy’ respondents (53.85 %, N=21) compared to (33.33 %, N=13). This shows that the group of shy respondents not only read English blogs, they manifested readiness for higher-order thinking (HOT) activities conducted in English. Discussion-based activities are encouraged in ESL classrooms because they promote critical thinking and active learning. In real-life ESL classrooms, the ‘shy’ students may not reap as much benefits from this activity because they are shy. In other words, they ‘are not talking’ (McCroskey and Richmond 1982). Most interestingly, this study shows that majority (91.3 %) of the ‘shy’ respondents were very interested in following discussion threads on the blog.

Item 5 (*When appropriate, I write comments on the blogs that I visit*) explains how ESL learners responded to the challenge of speaking their minds. In a classroom, it may be natural to expect the ‘not shy’ learners to express their opinion in front of the class or in small group activities. Zuraidah (2005) reported high correlation between group communication skills and consensus. Here, learners are willing to present and listen to ideas, debate and also argue over issues and individual vs group stance. The scenario may be vice versa for shy learners as they are reluctant to speak or express their opinion in public.

Based on this study, it can be deduced that the ‘shy’ group of learners share the desire to speak up like the rest of the class. With the introduction of technology via the ESL Blogosphere, now even the ‘shy’ students could express their opinion and speak their minds. More ‘shy’ respondents (58.97 %, N=22) leave comments on the blogs they visited compared to the ‘not shy’ (30.77 %, N=13).

Table 62.3 ANOVA of factors A and B with PRPSA levels

		Sum of squares	df	Mean square	F	Sig.
Factor_A4	Between groups	8.049	2	4.025	5.828	.006***
	Within groups	25.551	37	.691		
	Total	33.600	39			

***Significant at the $\alpha=0.01$

Table 62.4 Post hoc analysis of factors A.4 with PRPSA levels

Dependent variable		(I) level	(J) level	Mean difference (I-J)	Std. error	Sig.	95 % confidence interval	
							Lower bound	Upper bound
Factor_A.4	LSD	Low	Moderate	0.982	0.348	0.008***	0.277	1.686
			High	-0.357	0.666	0.595	-1.707	0.993
		Moderate	Low	-0.982	0.348	0.008***	-1.686	-0.277
			High	-1.339	0.606	0.034**	-2.567	-0.110
		High	Low	0.357	0.666	0.595	-0.993	1.707
			Moderate	1.339	0.606	0.034**	0.110	2.567

**The mean difference is significant at the $\alpha=0.05$

***The mean difference is significant at the $\alpha=0.01$

Table 62.3 shows the ANOVA analysis on factor A and B with PRPSA levels illustrating that only factor A.4 (*academic blogging*) with two items (item 3: *I read blogs that are designed to make me think and reflect on matters*) and item 4: *I think blogging is a good writing practice*) has a significant difference at $\alpha=0.01$ (Table 62.3).

Post Hoc analysis (Table 62.4) shows a significant difference regarding perception toward academic blogging among respondents from the three groups of Low, Moderate and High PRPSA.

According to McCroskey (1970), the PRPSA is an excellent measure for a research which investigates public speaking anxiety. It distinguishes between three levels of anxiety which may provide deeper understanding into learners’ perception, attitude and behaviour with regard to public speaking. There are three levels for the PRPSA measure namely high, moderate and low. Based on the research findings, majority of the respondents (79.49 %, N=31) were categorized as moderate, 15.38 % (N=6) were categorized as low, and only 5.13 % (N=2) were high in public speaking anxiety. Indeed, this is a normal population with highest concentration on moderate PRPSA level.

Table 62.5 below illustrates findings that depict interesting results regarding the respondents’ feedback on academic blogging in ESL classrooms. 56.41 % (N=22) reported that they read blogs that are designed to make them think and reflect on matters. This concentration comes largely from the moderate group which makes the majority. This result also answers doubts and scepticism on the practicality and

Table 62.5 Crosstabs between PRPSA levels *with academic blogging (factor A.4: items 3 and 4)*

Factors vs. PPSA levels	Item 3			Item 4		
	Low	Moderate	High	Low	Moderate	High
Strongly agree	1	12	0	3	28	2
Agree	1	8	0	1	3	0
Not sure	0	5	0	0	0	0
Disagree	2	4	0	1	0	0
Strongly disagree	2	2	2	1	0	0
Total	6	31	2	6	31	2

possible acceptance of learners' acceptance of ESL academic blogs. Here, it clearly shows that ESL learners favour blogs with contents that invite thinking and discussion, serious and academic.

Results on item 4 confirm the respondents' acceptance of academic blogging as a platform for writing practise. 89.74 % (N= 35) agreed that blogging provides good writing practice. Earlier research has delved with ESL learners facing problems in writing while in transition between secondary school and pre-university where the writing culture can be very different (Zuraidah and Melor 2004). Indeed, the types of writing promoted at the academic blog under study emphasizes on paragraph development, development of ideas using the informative and argumentative/ persuasive genres, as well as response and reflective writing.

62.5 Conclusion

ESL classroom shall benefit tremendously from technology-embedded teaching and learning approach. This study proves that with the use of ESL blogosphere, the weblog, the ESL practitioner provides an open platform for students to speak their minds and participate in discussions in English. As it is commonplace in the Malaysian ESL setting, many of our learners may have the ideas and responses but they are 'shy' to speak up and contribute in face-to-face communication. Given some technological innovation as an ESL teaching tool and technique, we shall see more speakers sprouting from the 'shy' cohort as they practise on the academic blog and deal with their 'shyness syndrome'.

To end, I shall present here some quotes regarding this element of educational transformation accomplished via the ESL blogosphere <http://www.speakup-avenue.blogspot.com> as follows:

S. Thava said: I actually turned into a new leaf. So it was a whole new experience to go in front and speak to everyone. It makes me feel like I owned the whole class and give my opinion to people. Naturally, I'm a very shy person as I don't talk much. It was actually you, Pn. Zue that gave me a push and helped me in doing my public speaking with a high level confidence. I will never forget the days where I had a chance to speak in front. Therefore, thank you so much Pn.

Zue for contributing a lot in my life. You did change me into a new person through your motivation and also this blog.

Tariq Ziyad said: I strongly agree with the way you approach the class activity by making this virtual classroom. Frankly speaking, I have never seen anyone come closer in making this blogosphere. As a student, I think this is the best way for us to share our thoughts, opinion because not everyone has the courage to speak in front of the class. Sometimes they have the idea, but they're scared to talk about. So what they can do is, by sharing in this blog. You always emphasis on this, fluency of thoughts is important in every speech. Well in order to really grab that skill, you must do some practise am I right?

Dhineshkarana said: It's totally awesome having this type of method of teaching. It shows how they share their knowledge and idea among students. It is also a place where all the students can meet at one place and have their discussion sort of revision on the way of giving contribution of what have they learned. Seriously before this I am quite shy of giving speech or talk in front of students and after this 3rd semester I ensure that I have got to know the way and how to avoid nervousness.

References

- Bahiyah, A. H. (1992). "Malu" – *Shyness and shyness behaviour in the English language classroom: Who, what, when, how, and why* (The English Teacher, Vol. XXI). Retrieved March 1, 2011, from <http://www.melta.org.my/ET/1992/main9.html>
- Davies, C. (2007). What can technology do for/to English? In A. Adams & S. Brindley (Eds.), *Teaching secondary English with ICT* (pp. 50–66). England: McGraw-Hill Education, Berkshire.
- Habibah, E., Zaidatol, A. L. P., & Rahil, M. (2005). *Competencies needed by teachers: Implications for best teaching practices*. Serdang: Universiti Putra Malaysia Press.
- Kanniah, A., & Krish, P. (2010). Collaborative learning skills in weblog. *CALL-EJ Online*, 11(2). Retrieved May 23, 2011, from http://www.callej.org/journal/11-2/kanniah_krish.html
- McCroskey, J. C. (1970). Measures of communication-bound anxiety. *Speech Monographs*, 37, 269–277.
- McCroskey, J. C. (1998). *An introduction to communication in the classroom* (2nd ed.). Acton: Tapestry Press.
- McCroskey, J. C., & Richmond, V. P. (1982). *The quiet ones: Communication apprehension and shyness* (2nd ed.). Dubuque: Gorsuch Scarisbrick.
- Nair, R., & Paramasivam, S. (2004). Empowering ESL learners with learner autonomy. In K. Kaur & B. Wijasuria (Eds.), *Transcending boundaries: Selected papers on ESL teaching and learning*. Petaling Jaya: SASBADI Sdn. Bhd.
- Raja Nor Safinas, R. H. (2009). Understanding learners' participation in an ESL classroom: A sociocultural perspective. *English Language Journal*, 3, 9–26.
- Ros, A. Y., Godat, M., Euler, T., & Jackson, P. (2009). Immersive virtual reality in a university setting: Creating an authentic learning environment through the virtual golden foods corporation. *Asian Journal of University Education*, 5(2), 27–43.
- Zakaria, M. H., Watson, J., & Edwards, S. L. (2010). Investigating the use of Web 2.0 technology by Malaysian students. *Multicultural Education & Technology Journal*, 4(1), 17–29.

- Zuraidah, A. (2005). Consensual small group decision making and cooperative learning (CL) in the English as a Second Language (ESL) classroom. In A. Pandian, M. K. Kabilan, & S. Kaur (Eds.), *Teachers, practices and supportive cultures* (pp. 437–354). Serdang: Universiti Putra Malaysia Press.
- Zuraidah, A. (2007). Willing learners yet unwilling speakers in ESL Classrooms. *Asian Journal of University Education*, 3(2), 57–74.
- Zuraidah, A. (2011). *Technology as niche and panacea for the shyness syndrome in ESL*. In Proceedings for the international conference on teaching and learning education, Putrajaya.
- Zuraidah, A. (2014). ESL students' engagement with the tutor's blog: Three phases of immersion. In *Language teaching and learning: New dimensions and interventions* (pp. 2–14). Cambridge: Cambridge Scholars Publishing
- Zuraidah, A., & Melor, M. Y. (2004). *An ESL writing course: Unravelling students' needs and concerns* (The English Teacher). Kuala Lumpur: MELTA.

Chapter 63

“A” Maths Potential Program: A Case Study of Mathematical Learning Using Technology-Based Approach

Anisah Abdul Rahman, Norhayati Baharun, Jufiza A. Wahab, Roslah Arsad, and Wan Noor Hayatie Wan Abdul Aziz

Abstract Since the past two decades, it is evident that technological tools in assisting T&L practices has growth rapidly particularly in Malaysia higher education sector. To date, in the context of teaching mathematics for tertiary level students, it plays important role as most students are equipped with latest technology gadgets such as smart phones and tablets. Thus, it appears that technology-based T&L approach would be of benefits especially for students who are lacking of skills in mathematics. At the UiTM (Perak) in particular, the past records showed that there was an increase in failure rates over time in mathematics subjects. For this reason, a case study was conducted which involved 235 students who enrolled in Calculus 1 (MAT183). An interactive T&L approach has been implemented, that is, both human and technology-based supports (innovative Tablet PC teaching) were used as tools for teaching in November 2013 session. It was conducted throughout the session and hence, a quantitative method was employed via students’ feedback in survey as well as their final examination results. The findings showed that the interactive T&L approach was deemed to be useful for students’ learning of mathematics (more than 90 %) and the use of Tablet PC as teaching tool was highly regarded by students (at least two third). Moreover, there was a decline in failure rates particularly on students’ final examination results in November 2013 session (failure rates were recorded less than 25 %) compared to the past four semesters exam results. Consequently, this indicates that the interactive approach of T&L has been successful in helping students’ understanding and learning of mathematics.

Keywords Mathematical learning • Students’ outcomes • Students’ performances • Technological tools

A. Abdul Rahman (✉) • N. Baharun • J. A. Wahab • R. Arsad • W.N.H. Wan Abdul Aziz
Faculty of Computer and Mathematical Sciences (FSKM), Universiti Teknologi MARA
Cawangan Perak, Kampus Tapah, 35400, Tapah Road, Tapah, Perak, Malaysia
e-mail: anisah372@perak.uitm.edu.my; norha603@gmail.com;
jufiz297@perak.uitm.edu.my; rosla280@perak.uitm.edu.my; wanno124@perak.uitm.edu.my

63.1 Introduction

Unlike other subjects, mathematics is characteristically a content-rich and context-poor subject frequently perceived as a difficult subject by most students who are trying to “read” rather than understand the concepts of mathematics. As a result, many students rely on rote learning and therefore a number of mathematics students who pass the subjects have failed to understand basic concepts. Furthermore, they lack of confidence in their mathematical ability and this often raises students’ negative beliefs and anxiety and dampers interest in mathematics (Arul et al. 2004).

“People are very happy to say they don’t like math,” said Sian L. Beilock, a University of Chicago psychology professor ... “No one walks around bragging that they can’t read, but it’s perfectly socially acceptable to say you don’t like math”. (Quoted in Sparks 2011, p. 1)

The increasing number of students who dislike mathematics due to a lack of mathematical proficiency has led to fewer students enrolling in mathematics as a major subject particularly science and technology field. This is evident in several studies (e.g. Crawford and Schmidt 2004; Ho 2010; Tariq 2008; Thomas et al. 2009) that reveal a crucial stage of declining skills in many disciplines worldwide. This has flagged the need to provide adequate technology-based mathematics support for students’ mathematical learning through not only developing their knowledge and skills but through empowering them to apply these to relevant or real world problems. This is particularly important for teachers of primary and tertiary level students.

Likewise, mathematics lecturers from the Faculty of Computer and Mathematical Sciences at the UiTM (Perak) have revealed their concerns on the deficit of mathematical skills in several diploma programs offered by the university. Moreover, the past records showed that there was an increase in failure rates over time especially in mathematics subjects. For this reason, an interactive T&L approach which employs both human and technology-based supports (innovative Tablet PC teaching) has been implemented for all mathematics subjects in November 2013 session. In particular, Calculus 1 (MAT183) was selected as a subject in this case study as to examine the impact of interactive T&L approach in improving the mathematical learning among diploma students at the UiTM (Perak). Thus, this study aimed to support students’ learning and improve their mathematical skills, as well as to reduce the failure rates in mathematics subjects.

63.2 Context

Table 63.1 had shown the analysis of failure rates in the final examination results for the past four semesters in Calculus 1 (MAT183). The failure rates were recorded at the lowest 14 % to the highest 30 % and it shows an inconsistency of the students’ performances in their final examination on mathematics subject. It has indicated the needs for support on students’ learning of mathematics subject at UiTM (Perak). Due to this scenario, there was an issue raised on the quality of students’ intakes and teaching methods which possibly affects their performances in mathematics subject.

Table 63.1 Failure rates for the past four semesters of mathematics subjects at UiTM (Perak)

Subject	Semester	Total	% Fail	Subject	Semester	Total	% Fail	
MAT037	Apr-12	59	15.25	MAT222	Apr-12	10	20.00	
	Nov-12	367	5.68		Nov-12	132	3.48	
MAT108	Apr-12	192	22.92	MAT233	May-13	100	26.60	
	MAT112	Apr-12	393		24.16	Nov-13	115	10.27
	Nov-12	361	24.42	Apr-12	212	29.63		
	May-13	125	43.48	Nov-12	392	21.96		
	Nov-13	144	29.05	May-13	290	21.11		
MAT123	Apr-12	10	0.00	Nov-13	201	35.86		
	Nov-12	85	3.53	MAT249	Apr-12	48	15.48	
	May-13	21	19.45	MAT253	Apr-12	108	10.97	
	Nov-13	83	1.20	MAT263	Apr-12	299	10.91	
MAT133	Apr-12	79	22.04		Nov-12	122	10.72	
	Nov-12	196	12.05		May-13	411	8.15	
	May-13	41	3.81		Nov-13	204	14.42	
	Nov-13	77	2.60	MAT283	Apr-12	75	23.33	
MAT183	Apr-12	401	13.93		Nov-12	110	22.69	
	Nov-12	324	29.76		May-13	162	17.30	
	May-13	350	28.06		Nov-13	121	14.13	
	Nov-13	298	13.75	MAT285	Apr-12	34	23.53	
MAT199	Apr-12	39	35.26		Nov-12	133	18.05	
MAT210	Apr-12	63	20.63		May-13	83	18.07	
	Nov-12	75	17.33	MAT300	Apr-12	36	8.33	
	May-13	34	38.24		Nov-12	7	14.29	
	Nov-13	101	32.67		May-13	54	12.96	
					Nov-13	16	6.25	

With a rapid growth of technology-based teaching and learning practices particularly in Malaysia nowadays, this possibly can provide a better way of learning mathematics. For this reason, a special project known as “A” *Maths Potential Program* has been conducted throughout a 14-week November 2013 session for all students who enrolled in Calculus 1 (MAT183) subject. Align with the implementation of blended learning approach at UiTM (Perak), this program employs both human and technology-based supports for teaching and learning mathematics, taking into account the following statement made by Baharun and Porter (2009),

...there is an issue on the implementation of technology in blended learning relating to how, what, why, and when this technology is appropriately and effectively combined with face-to-face or classroom learning (p. 41).

63.3 Method

“A” Maths Potential Program is a structured framework which combined both technology support (Tablet PC as a teaching tool) as shown in Fig. 63.1. The framework of this program is divided into two parts which is formal face-to-face lectures and addition of a compulsory Maths Clinics and Practice Test sessions. The Maths

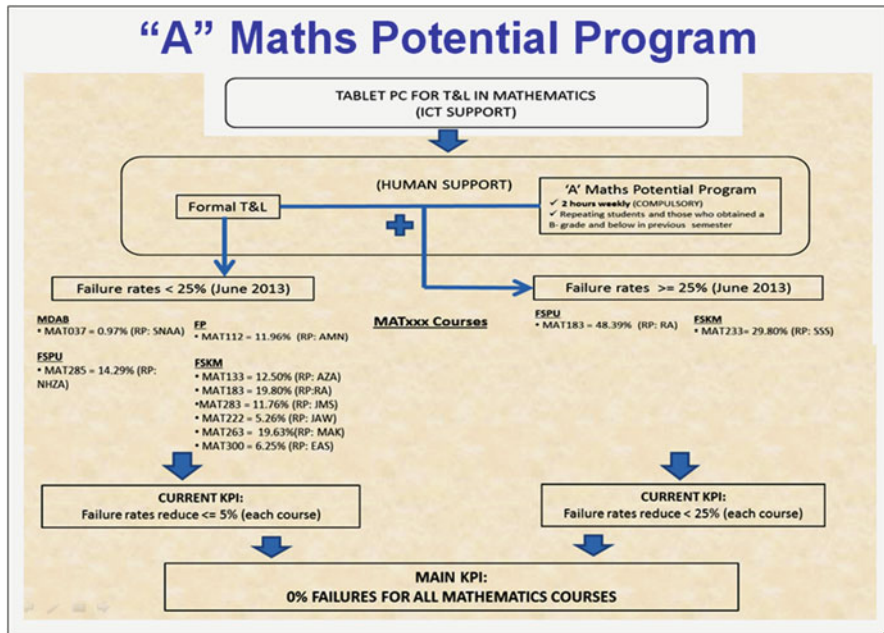


Fig. 63.1 A structured framework of the “A” Maths Potential Program

Clinic and Practice Test sessions is specifically designed for weak students. The identification of weak students was based on their performance or grade obtained (B- and below) of previous mathematics (pre-requisite) subject enrolled. This group of students was identified in the first week of session and they were asked to attend (attendance is compulsory) all Maths Clinics and Practice Test sessions which were conducted by the lecturers throughout 14-week session.

An action plan on Calculus 1 (MAT183) was implemented during week 3 until week 14 in the November 2013 session. As shown in Fig. 63.2, a total of three Maths Clinics and three Practice Test (i.e. preparatory) sessions were held each fortnight alternately. Practice Test sessions were conducted a week before their final tests aimed to support and guide the weak students. They were drilled to master the concepts and topics to be assessed in their final tests. Meanwhile, Maths Clinics sessions were attended by all students enrolled in Calculus 1 (MAT183) which included discussions and revisions of difficult topics in the subjects. Throughout these two sessions, special attention was on students who had failed the subject twice in previous semesters.

The use of Tablet PC for teaching was fully implemented in both formal face-to-face lectures and “A” Maths Potential Program. Recorded lectures, discussions, and revision of topics were uploaded into the Tablet PC and made accessible to students via the e-learning system known as i-Learn. A set of videos was also developed by the lecturers to support students’ understanding and revision of difficult topics covered in Maths Clinics and Practice Tests sessions (sample of video as shown in Fig. 63.3).

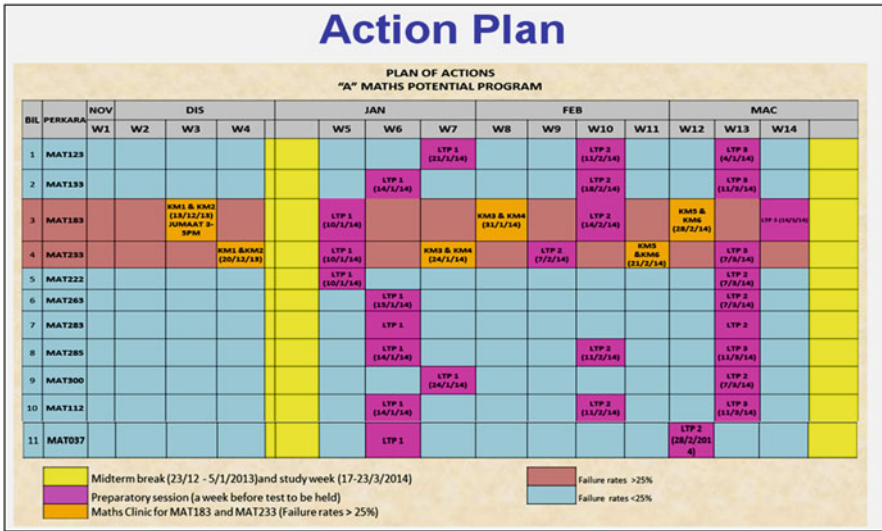


Fig. 63.2 Calculus 1 (MAT183) action plan in November 2013 session

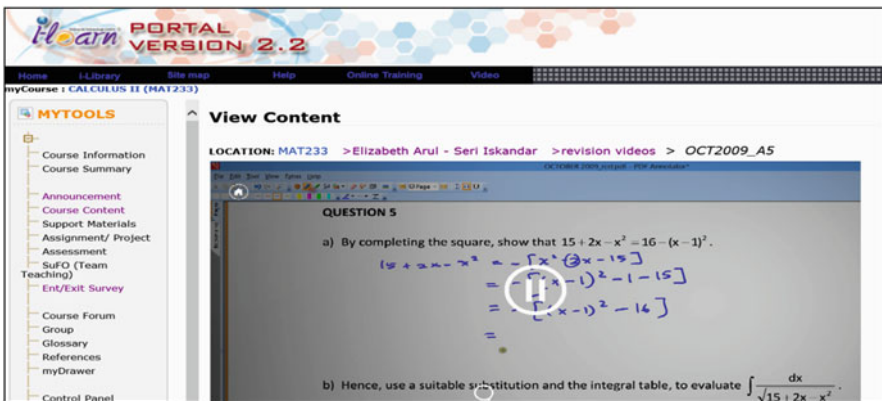


Fig. 63.3 Sample of revision videos uploaded onto the i-Learn system

Additionally, a survey entitled *Best Practice T&L* was administered at the end of session in week-14 which involved all students enrolled in Calculus 1 (MAT183). The *on-paper* survey was distributed to students and it was completed in classes. The aims of this survey were to evaluate the effectiveness of the usage of Tablet PC for teaching and how well the “A” Maths Potential Program could support students’ learning of mathematics at UiTM (Perak). All feedback and responses provided by students has been analyzed and reported in the next section of this paper.

63.4 Results and Discussion

The effectiveness of the “A” Potential Math Program was evaluated throughout the session via *on-paper* survey as well as the students’ final examination results. Based on the demographic data provided through the survey showed that 35 % (n=81 students) out of 235 respondents enrolled in Calculus 1 (MAT183). Meanwhile, 96 % of them (n=78 students) anticipated to obtain their final examination grades at least a B- and none of them expected to fail. This indicates that almost all students were confident in completing the subject successfully at the end of session.

63.4.1 Usefulness of Learning Materials

A variety of teaching and learning materials which combined both human and technology-based supports has been implemented for the students to ensure the teaching and learning process is running smoothly as well as its quality particularly in Calculus 1 (MAT183) has been optimized. Commenced in November 2013 – April 2014 session, an innovative teaching tool via a Tablet PC has been used for all mathematics courses in UiTM (Perak). As shown in Fig. 63.4, the analysis of the usefulness of learning materials shows that the majority of students (over two thirds) responded: the (1) lectures (using the Tablet PC), (2) handouts/lecture notes, (3) examples discussed in lectures, (4) tests conducted in classes, (5) past tests and final examination papers, (6) Practice Test sessions (LTP), and (7) Maths Clinics sessions (KM) were useful for their learning in that particular subject.

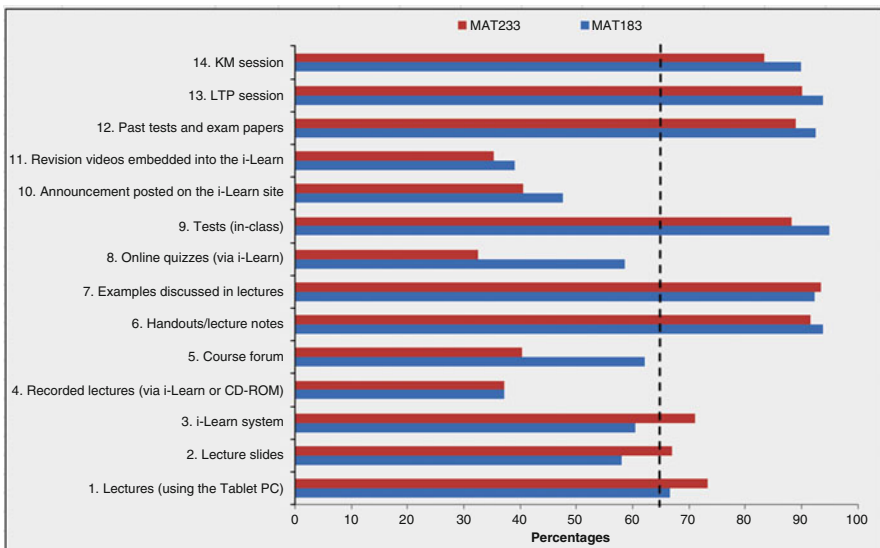


Fig. 63.4 Percentages of usefulness of learning materials provided in Calculus 1 (MAT183)

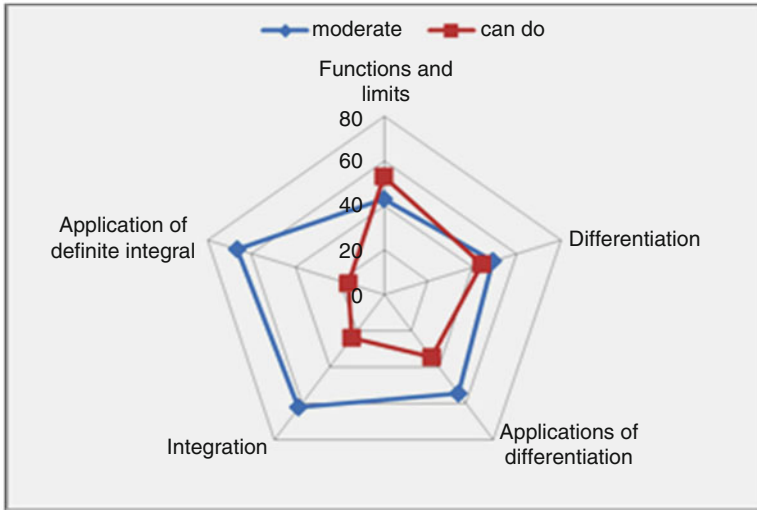


Fig. 63.5 Percentages of students' competency in major topics in Calculus 1 (MAT183)

Interestingly, Practice Tests and Maths Clinics sessions have been positively perceived by the majority of students (at least 90 %) that it helped them in to learn and understand more in Calculus 1 (MAT183). This was supported by the response of students (50 % out of 76 responses) suggested that both Practice Tests and Maths Clinics sessions not possibly meant for weak students only but they also had attracted the other students' interests to get involved. In other words, the slots of both sessions have to be increased. Nevertheless, this recommendation must first be examined for the purpose of its implementation due to a small number of current teaching staff, classrooms availability, and time constraints. The use of Tablet PC as a tool for teaching is currently at the early stage of its implementation and for this reason most lecturers are still searching and trying the best ways to make use of the tool for their teaching in classes as well as the i-Learn system. Accordingly, this teaching innovation has to be enhanced and improved in the upcoming semesters, including the uses of the i-Learn system such as the online quizzes, course forum, recorded lectures, revision videos, and other resources.

63.4.2 Students' Competence in Topics

The survey also asked the students to state their confidence (perceptions) in terms of their competence in major topics taught in the subject. As shown in Fig. 63.5, the data showed that the majority of students were moderately confident they can do in all major topics, particularly applications of differentiation (54 %), integration (63 %), and application of definite integral (66 %). In contrast, only a small number (about one third) of students responded that they were confident in those three

Table 63.2 Analysis of students' final examination results in Calculus 1 (MAT183)

Average final marks (100 %)			
MAT183		MAT233	
Nov-13	Apr-14	Nov-13	Apr-14
$n_1 = 339$	$n_2 = 222$	$n_1 = 189$	$n_2 = 293$
56.22	68.59	54.03	61.12
p < 0.001		p < 0.001	
(t ₅₅₉ = 7.620)		(t _{337.74} = 4.446)	
% Failures (final marks < 50 %)			
25.4	10.4	29.6	14.3
p < 0.001		p < 0.001	
(z = 4.39)		(z = 4.07)	

topics. However, about half of the students were confident in two topics, functions and limits; possibly due to these topics were taught at the beginning of session. This indicates that more attentions and concentrations need to be done particularly in providing support to students such as instructional videos, recorded lectures, revision videos, and Practice Tests/Maths Clinics sessions, specifically in three major topics mentioned above.

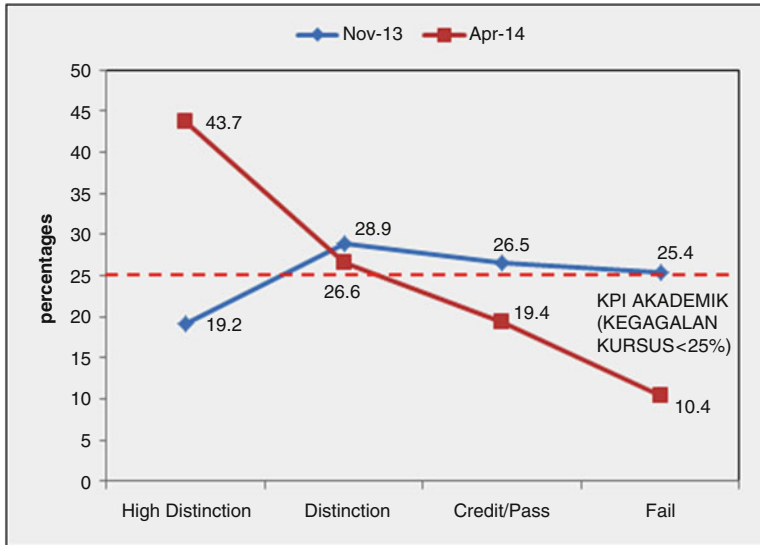
63.4.3 Analysis of Final Examination Results

As shown in Table 63.2, the statistical analysis of independent t-test showed that the mean marks of students' final examination results was significantly increased in April 2014 compared to November 2013 session in Calculus 1 (MAT183). In specific, there was an increase of 12.4 marks in Calculus 1 (MAT183) (t₅₅₉ = 7.620, p < 0.001). Consequently, the failure rate also has significantly dropped to 10.4 % in April 2014 as compared to 25.4 % in November 2013 session.

As shown in Fig. 63.6, it revealed that the students' achievement on the highest grades (A+, A, and A-) of the final examination in Calculus 1 (MAT183) has significantly increased in April 2014 session. The percentage increase was recorded at 24.5 % in April 2014 compared to November 2013 session (z = 6.26, p < 0.001) in Calculus 1 (MAT183).

63.4.4 Comparison of the Past Final Examination Results

An analysis of the overall final examination results for the past three semesters has been done for all mathematics subjects at the UiTM (Perak). As shown in Fig. 63.7, it is clearly show that all mathematics subjects have achieved the *Academic Performance Indicator* which recorded the failure rates below 25 % in April 2014 session.



Note: High Distinction = A+, A, A- Distinction = B+, B, B-
 Credit/Pass = C+, C Fail = C-, D+, D, E, F

Fig. 63.6 Analysis of students’ final examination grades in Calculus 1 (MAT183)

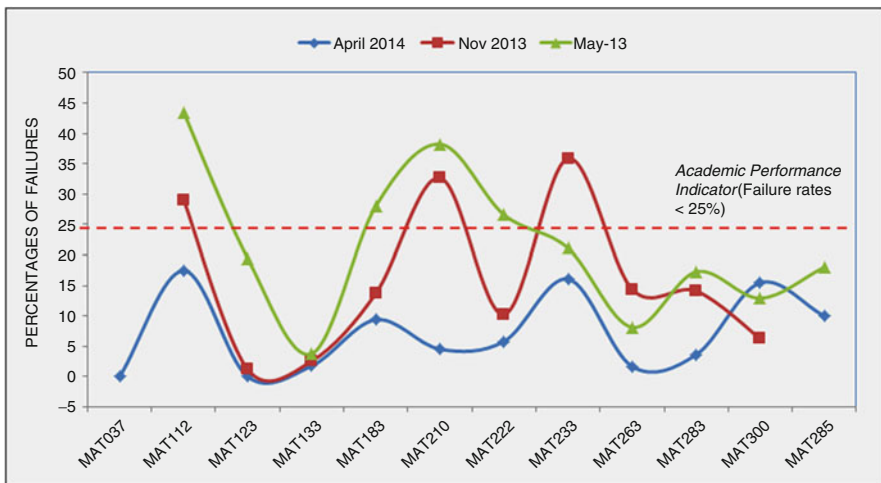


Fig. 63.7 Overall percentages of failure rates in mathematics subjects at the UiTM (Perak) for the past three semesters

In summary, the above results indicated that the “A” Maths Potential Program has been effectively helped students in learning of mathematics as well as improved their performances in the subject.

63.5 Concluding Remarks

This paper has largely focused on the innovation of teaching and learning practices as to improve students' mathematical learning and reduce the failure rates through the implementation of "A" Math Potential Program. This program was conducted successfully in assisting the mathematical learning process among students at the UiTM (Perak). There are two main components which effectively could improve students' learning in mathematics subject: (1) human support, and (2) technology-based support. The Tablet PC was used as a tool for teaching in classes and also to develop learning materials to be uploaded onto the i-Learn system. The findings presented in this paper are published at the initial stage of the program implementation (Baharun 2013a, b; Baharun et al. 2014), thus it will continue to be aligned with recommendations and suggestions provided by the students and lecturers. For the future work of this program, there is a need of more teaching videos to be created and uploaded onto the i-Learn system so as to support students' learning and understanding particularly during classes.

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References

- Arul, E., Baharun, N., Hussin, F., & Nasir, A. M. (2004). *A study of mathematics anxiety among beginners*. Shah Alam: University of Mara Technology (UiTM).
- Baharun, N. (2013a). *Tablet PC technology: An interactive tool for T&L in education space without limits*. Project presented at the international exposition of research and innovation in education 2013 (EDU-INERI2013) on 20–22 September 2013, UPSI, Tanjong Malim, Malaysia.
- Baharun, N. (2013b). *Innovative best practice T&L at anytime, anywhere*. Project presented at the 3rd National Invention, Innovation & Design (NiiD) UiTM Perak 2013 on 11–12 December 2013, UiTM (Perak) Seri Iskandar Campus, Malaysia.
- Baharun, N., & Porter, A. (2009). Teaching statistics using a blended approach: Integrating technology-based resources. In *Same places, different spaces. Proceedings ascilite Auckland 2009*. <http://www.ascilite.org.au/conferences/auckland09/procs/baharun.pdf>
- Baharun, N., Rahman, A. A., Shaffie, S. S., & Arsad, R. (2014). "A" Maths Potential Program: A technology-based T&L approach. Project presented at the Invention, Innovation, & Design Exposition (IIDEX 2014) on 30 April 2014, DATC UiTM Malaysia.
- Crawford, M., & Schmidt, K. J. (2004). Lessons learn from a K-12 Project. In *Proceedings of the 2004 American society for engineering education annual conference and exposition*. Washington, DC: American Society for Engineering Education.
- Ho, K. F. (2010). Year 11 advanced mathematics: Hearing from students who buck the trend. In L. Sparrow, B. Kissane, & C. Hurst (Eds.), *Shaping the future of mathematics education. Proceedings of the 33rd annual conference of the Mathematics Education Research Group of Australasia*. Fremantle: MERGA.
- Sparks, S. D. (2011). It's more than just disliking math, according to scholars. In V. B. Edwards (Ed.), *Education week: Researchers probe causes of math anxiety*. Bethesda: Editorial Projects in Education, Inc.

- Tariq, V. N. (2008). Defining the problem: Mathematical errors and misconceptions exhibited by first-year bioscience undergraduates. *International Journal of Mathematical Education in Science and Technology*, 39(7), 889–904.
- Thomas, J., Muchatuta, M., & Wood, L. (2009). Mathematical sciences in Australia. *International Journal of Mathematical Education in Science and Technology*, 40(1), 17–26.

Chapter 64

TPACK in VAE: A Study on Students' Readiness to Use E-Learning in the Teaching and Learning of Visual Art Education

Roslaili Anuar, Wan Zamani Wan Zakaria, Harrinni Md Noor,
and Noor Farhani Othman

Abstract A study was conducted among the Art and Design Education undergraduates at Faculty of Education, Universiti Teknologi MARA (UiTM) to find out their readiness to use e-Learning in Visual Art Education (VAE). This paper discusses the use of Technological Pedagogical Content Knowledge (TPACK) to describe students' readiness towards e-Learning through their understanding of technology and pedagogical content knowledge. The data were gathered from 27 final year students in the Art and Design Education programme. A set of questionnaire was distributed to determine the readiness and ability of the undergraduates to adopt the new technological approach in the teaching and learning of VAE. The questionnaire measured their technology knowledge (TK), content knowledge (CK) and technological pedagogical knowledge (TPK). The overall findings on TK showed that the students can learn with technology easily and have technical skills needed to use technology in the teaching and learning of VAE. Majority of the students agreed that they have sufficient CK and could think of various ways of using technology to develop understanding of VAE. Based on students' TPK, the results showed a significant finding towards their ability to adapt technology in the teaching and learning activities. The findings in this study clearly revealed that TPACK is a good platform to measure students' readiness towards using technology in the teaching and learning of VAE. As a conclusion, the findings showed that the undergraduates were ready to use technology in their teaching and learning purposes.

R. Anuar (✉) • H.M. Noor • N.F. Othman
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: rosila206@salam.uitm.edu.my; harrinni@salam.uitm.edu.my;
farhani9851@salam.uitm.edu.my

W.Z.W. Zakaria
Faculty of Art and Design, Universiti Teknologi MARA,
Jalan Kreatif, 40460 Shah Alam, Selangor, Malaysia
e-mail: wanzfssr@salam.uitm.edu.my

Keywords Attitudes • E-learning • Technology readiness • Visual art education

64.1 Introduction

Educational technology use has been spreading rapidly in the world including in Malaysia. It has been surrounding and influencing us day by day and it is impossible to imagine the world today without the penetration of technology. The implementation of technology in education is not new but it has been implemented since the early 1960s in the US and Europe. Malaysia has been developing and implementing the technology in education since and it is continuously developing. Jamaludin (2005) observed that the paradigm shift in the community has changed the educational system in our country. The far reaching change in technology development has influenced the educational system as the Malaysia government has formed the *Wawasan 2020* (Vision 2020) to transform Malaysia into a fully developed and industrial country by the year 2020.

The infusion of technology in education is proven to be effective in educating and guiding the students who have different learning style and background. As mentioned by Harun and Tasir (2003), multimedia can become an effective and positive communication medium due to its ability to simultaneously combine various colours and styles of text, audio, video and animation featured on the screen. The importance of technology has not only influenced the school but the higher institution has shown rapid progress in implementing the technology in the teaching and learning process as it serves as an option for the educators to facilitate student learning.

The vast development of the Internet and multimedia has made e-learning as a renowned medium in the higher institution as it contributes to a new and improved way of teaching. In Malaysia, the number of the higher institutions using e-learning as a support tool in teaching is increasing tremendously and among them is Universiti Teknologi MARA (UiTM).

The Universiti Teknologi MARA (UiTM) is one of the higher institutions in Malaysia that encourages the students including the lecturers to adopt the new style of teaching. UiTM has initiated the e-learning since 2004 with the establishment of i-Learn Centre as the primary platform to promote e-learning as UiTM is currently enhancing e-learning in the campus to ensure the teaching and learning process will be delivered effectively and efficiently among the students to encourage a student centred learning environment. With the e-learning implementation, the students are able to access and retrieve the notes supplied by the lecturers on-line anytime and anywhere. This will provide ample time for the students to study and at the same time they are able to create their own style of learning. Even though the technology implementation is meant to facilitate the students' learning process, education through technology serves as an alternative to increase the students' cognitive and psychomotor development, and affective learning experience.

This study is a preliminary study regarding e-learning readiness among the Art and Design Education students, namely: (a) Do the students have the necessary

knowledge and skills to adopt the new way of accessing the information and the new style of learning? (b) To what extent have students of the VAE program used computers and related technology? (c) Do students enjoy using the technology? The e-learning readiness enables the students to create comprehensive learning strategies in utilizing e-learning tools to enhance their knowledge and successful implementation of IT skills.

Thus, a framework is needed to assist the students in understanding the technology further to ensure the success of e-learning readiness. Therefore, this study is done to identify the TPACK model as a strategy for an effective learning process for the Art and Design Education students to include the e-learning as the main medium in their teaching and learning process in future. The teaching and learning of the VAE subject via e-learning with the development and understanding of the TPACK would provide a meaningful process as the technology is combined with the multimedia elements to ensure better understanding of technology among the students. The students need the TPACK as an opportunity for them to develop and understand the technology to enable them to plan, organize, evaluate and manipulate the integration of e-learning in their teaching and learning process and it is hoped that the students are ready to adopt the new style of teaching without negligence. Supported by Mercado (2008), regardless of the degree of adoption, a successful e-learning endeavour must always involve a systematic process of planning, designing, developing, evaluating and implementing an e-learning environment where learning and teaching is actively fostered and supported. This can only happen when the e-learning environment is meaningful to all the stakeholders including the learners, teachers, support staff and the institution. Therefore, the e-learning implementation is useless unless the understanding of the technology is highlighted among the students by the institution to ensure that the technology of e-learning is successfully adopted by the students.

64.2 Statement of Problem

This study is to determine the student's readiness to employ the e-learning in the teaching and learning in UiTM. The Art and Design Education programme offers the major in arts and minor in technology for the students. In order to compete with the twenty-first century style of learning, the technology infusion is necessary to enable the students to become competent and well prepared for the future career. More precisely, it is argued that e-learning when combined with appropriate instructional strategies can promote participation in the knowledge economy, including life-long learning and information literacy and management skills (Souleles 2011).

The method of learning by using electronic medium is certainly an option in the twenty-first century. UiTM is one of the higher education institutions which promote e-learning as a medium of learning. Recognising the vital role of technology in education and professional practice, MARA University of Technology (UiTM) has long been encouraging flexibility in teaching and learning modes through the initiatives of its Institute for Educational Development (Abdul Nasir et al. 2011). The e-learning is implemented to promote student-centred learning. By using

e-learning, students will have easy access to the on-line notes provided by lecturers or to update the information from lecturers. As stated by Rosli et al. (2012), the e-learning portal provides a space or place for students to make searches across a multitude of electronic resources which include electronic books and many other useful links. In addition, students can make use of the forums, chat, resources, update profile and so on. E-learning also helps them to communicate faster and consistent, new and updated content anytime and anywhere.

E-learning applications in UiTM are still in early stage and the concept of e-learning method is considered as a challenge to the students to adopt the technology. Despite this, there are students who are unable to compete with the advantages of e-learning in the teaching and learning procedure because they do not consider e-learning method is important. Another factor contributed to this feeling is due to the weakness associated with difficulty in accessing technology, the quality of information changes rapidly and it requires time along with technology skills. Thus, this study is to examine the capacity and level of readiness to adopt the electronic learning method among students in Art and Design Education Program in the Faculty of Education, UiTM, Shah Alam.

64.3 Literature Review

In the e-learning development, students can learn anything without boundaries whether from work or from their own place as e-learning gives the students opportunity for self-directed study. In the era of globalisation, the development of electronic communication and the Internet has removed the barriers of place, time and space (Rosli et al. 2012).

The Art and Design Education Program in UiTM has been implementing the technology or the new media in the minor component from the program. This is to ensure that the graduates who will be teaching the VAE subject in secondary schools from the program have the added value where they will not only be able to teach excellently but also able to conduct the technology efficiently. For a sustainable educational transaction in the electronic medium and cyberspace, higher education institutions need to establish an e-learning infrastructure that requires the development of a virtual learning environment (Rosli et al. 2012). As mentioned in the *Sukatan Pelajaran Kurikulum Bersepadu Sekolah Menengah* (2002), the technology implementation has been clearly justified in the third objective of the VAE subject in the Form Four and Form Five module as part of the teaching technique to ensure teaching effectiveness in the subject.

Therefore, the demand of the technology implementation is clearly stated and it is essential for the students to be proficient in handling the technology. The e-learning provides an opportunity for the students to optimize their self-learning interactively and this would allow the students to generate creative and critical thinking and support their lifelong learning. The technology creates a new approach to deliver the curriculum in a new way and that contribute to a different style of learning as compared to the traditional approach.

Before implementing the e-learning, the university will have to be able to serve the students with the technology device that is accessible whenever they are around the university. As stated by Kaur and Abas (2004), e-learning readiness helps an organization to design e-learning strategies comprehensively and to implement its ICT goals effectively.

64.3.1 E-Learning Readiness

Kaur and Abas (2004), further stated that significant to learners' involvement in e-learning is the notion of e-readiness, that is, their ability to make use of e-learning resources and multimedia technologies to improve the quality of learning. As elaborated by Mishra and Koehler (2008a), new technologies are changing how subject matter is conceptualized and taught, and redefining teachers' roles in the classroom. The e-learning readiness is crucial in shaping and developing the students' learning style as this will allow them to be prepared physically and mentally to perform their teaching tasks in future.

64.3.1.1 Technology Readiness

In order to achieve the high standard of the e-learning implementation, the institution has to provide good facilities to perform the learning and teaching via e-learning. The e-learning style is fully depending on the computer and the Internet. Therefore, the software and the hardware including unlimited Internet access have to be provided for the students to ensure e-learning is achieved. Logan et al. (2007) noted that adoption of e-learning will be delayed where available technologies fail to match a subject's core aims, media and outputs. This will include reliable development and management of the infrastructure such as the server and the system provided is in order.

64.3.1.2 Technological Skills

To venture and to develop the e-learning adoption, the students are required to gain the skills of handling the technology to ensure the success of the e-learning implementation. Even though the institution has been providing all the facilities, e-learning adoption effectiveness depends on the students' skills and readiness in using the technology as this will prevent the facilities from being treated as an accessory in the computer laboratory. According to Shidki and Yussof (2008), an individual has to gain the basic knowledge regarding the ICT before integrating the technology in the teaching and learning process. This is to ensure the information is delivered effectively and systematically. A mixture of experience and the ability to adapt the required knowledge and skills to an e-learning environment are a good starting point and these can be learnt in a number of ways but will require practice to develop proficiency in the skill.

64.3.1.3 Content Readiness

The e-learning adoption depends on the content readiness which relates to the factor considered as the students' ability in interpreting the subject matter whether it is to be learnt or taught and goals of the instruction implemented.

64.3.1.4 Students' Attitude

The implementation of e-learning depends on the students' attitude in adopting the technology. To ensure fulfilment of e-learning implementation objectives, the institution has to consider student readiness. Yuan (2004), also pointed out that students' attitude toward the computer was an important influencing factor in the application of technology in various instructional settings. To ensure the students' readiness for e-learning, ample time needs to be provided to them to study and discuss the e-learning adoption initiative.

64.3.2 TPACK Framework

In this study, the e-learning readiness is measured with the technological, pedagogical and content knowledge (TPACK) as this framework is suitable to measure the students' readiness to adopt the technology in their learning process. This framework also fits into the school environment as it is built for teachers' understanding during teaching with technology in school. TPACK is a framework to understand and describe the kind of knowledge needed by a teacher for effective technology integration (Mishra and Koehler 2006). This framework consists of teacher's knowledge about technology, pedagogy as well as the content for thorough understanding and it is implemented in the study conducted among the VAE students. Figure 64.1 shows how the TPACK framework will support the knowledge and the technology skills among the students.

The TPACK framework will connect the content which refers to the VAE subject, pedagogy as relates to the teaching and learning of the students and technology of e-learning. This would bring to the knowledge of the students in planning and organizing the integration of technology in their learning process as well as attending to the student needs. Mishra and Koehler (2008a, b), has acknowledged the TPACK to seven main components as the guidelines:

- Content knowledge (CK) – knowledge about the actual subject matter that is to be learnt and taught.
- Pedagogical knowledge (PK)- deep knowledge about the processes and practices or methods of teaching and learning encompasses.
- Pedagogical content knowledge (PCK) – core business of teaching, learning, curriculum, assessment, and reporting such as the conditions that promote learning.

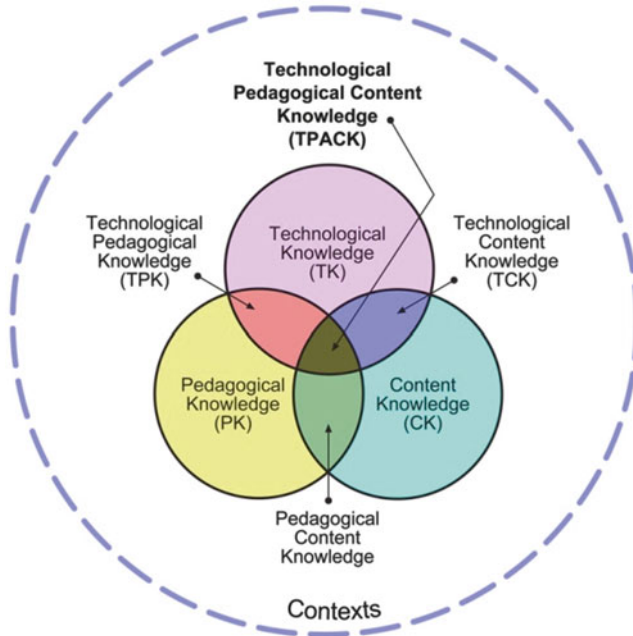


Fig. 64.1 The TPACK framework (Mishra and Koehler 2006)

- Technology knowledge (TK) – always in a state of flux – more so than the other two ‘core’ knowledge domains in the TPACK framework.
- Technological content knowledge (TCK) – development of new technologies that afford the representation and manipulation of data in new fruitful ways.
- Technological pedagogical knowledge (TPK) – understanding of how teaching and learning changes when particular technologies are used.
- Technological pedagogical content knowledge (TPCK) – an understanding that emerges from an interaction of content, pedagogy and technology knowledge.

64.4 Methodology

64.4.1 Research Design

To gather the data for this study, a questionnaire was employed based on the TPACK framework to measure the technological knowledge, pedagogical knowledge and content knowledge. All the private information about the participants remains confidential. The participants were selected based on their background of studies and their knowledge in the VAE subject as well as their technology knowledge and skills.

64.4.2 Population and Sample

This study is focusing on the students of the Art and Design Education Program in the Faculty of Education, UiTM, Shah Alam. The student population is a group of final year students who will be teaching the VAE subject when they graduated. The students are aged 23 and above and at this level they are able to answer the questions with their own judgement as well as giving their opinions freely.

64.4.3 Instrumentation

A questionnaire was implemented in this study to gather the data. It is divided into four sections of A, B, C and D. The A section relates to the participants general interests towards technology in the classroom. The section B consisted of questions regarding the TPACK framework to measure the participants' perception of mastering the knowledge technology, pedagogy, and content. Meanwhile, section C contains questions that reflect the attitude of the participants towards the e-learning implementation in the VAE subject. Lastly, section D is the demographic information about the participants and it remains confidential. The questionnaire is using the five-point Likert scale to assess the users' view regarding the e-learning adoption readiness. The scale is described as 5 – *Strongly Agree* SA, 4 – *Agree* A, 3 – *Undecided* U, 2 – *Disagree* D, and 1 – *Strongly Disagree* SD.

A total of 39 questionnaires were distributed to 27 final year students. The survey data were analysed using the basic descriptive statistics and factor analysis. The SPSS (Statistical Package for the Social Sciences) software was used to perform the analysis.

64.5 Results and Discussions

Based on Table 64.1, the students' readiness to adopt e-learning is tested with the TPACK questionnaire to measure their technology knowledge (TK), content knowledge (CK) and the technological pedagogical knowledge (TPK). For overall findings on TK, the results show that the students are ready to use the technology in their teaching and learning purposes, with 63 % of students responding that they can learn the technology easily; from this we can conclude that the students are familiar with the technology and that e-learning can be implemented easily as the students are knowledgeable in the technology skills. Some 69.20 % students responded that they have the technical skills needed to use the technology. Most of the students owned a laptop and this would enable them to use the technology anytime and anywhere.

Table 64.1 Summary for the survey of student's readiness in adopting the e-learning with TPACK framework

TK (Technology Knowledge)	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
I know how to solve my own technical problems	-	7.40 %	22.20 %	70.40 %	-
I can learn technology easily	-	3.70 %	18.50 %	63.00 %	14.80 %
I keep up with important new technologies	-	-	19.20 %	73.10 %	7.70 %
I frequently play around the technology	-	7.70 %	26.90 %	57.70 %	7.70 %
I know about a lot of different technologies	-	11.10 %	40.70 %	48.10 %	-
I have the technical skills I need to use technology	-	7.70 %	19.20 %	69.20 %	3.80 %
I have had sufficient opportunities to work with different technologies	-	4.20 %	25.00 %	66.70 %	4.20 %
CK (Content Knowledge)					
I have sufficient knowledge about VAE	-	3.70 %	7.40 %	74.10 %	14.80 %
I can use a visual way of thinking	-	3.70 %	14.80 %	74.10 %	7.40 %
I have various ways and strategies of developing my understanding of VAE	-	3.70 %	14.80 %	51.90 %	29.60 %
TPK (Technological Pedagogical Knowledge)					
I can choose technologies that enhance the teaching approaches for a lesson	-	-	-	77.80 %	22.20 %
My lecturers in the VAE program has caused me to think deeply about how technology could influence the teaching approaches I use in my classroom	-	3.70 %	7.40 %	59.30 %	29.60 %
I am thinking critically about how to use technology in my classroom	-	7.40 %	14.80 %	44.40 %	33.30 %
I can adapt the use of technologies that I am learning about to different teaching activities.	-	-	-	77.80 %	22.20 %

The CK refers to understanding the content of the VAE subject. Some 74.10 % students agree that they have sufficient knowledge about the VAE subject and therefore they are ready to learn by using e-learning, while 51.9 % of the students agree that they can think of various ways of implementing the technology in developing their understanding of the VAE subject. Most of the students gained their diploma in various areas of study in UiTM but mostly came from the Art and Design faculty. Therefore, the students have been exposed to basic technology as UiTM has provided them with subjects that incorporate technology in their previous learning experience. The computer labs are also provided for the students to use to facilitate their teaching and learning process.

The TPK is measuring the students' pedagogy and technology knowledge. The students have agreed to all the questions implemented in the questionnaire and the highest score is 77.8 % as the students are able to choose the technology that they think would be able to enhance their teaching and learning approaches. The same percentage is shown for the students' ability in adapting the technology that they are learning to different teaching activities. The students are significantly positive towards their ability in implementing the technology.

From Table 64.2, we can see that the attitude of the students is highlighted to determine their readiness in adopting technology. The results indicated that a total of 33.3 % students neither agree or disagree when asked whether they enjoyed learning with e-learning. Another 33.3 % students agree that they enjoy learning with e-learning. Somehow, 22.2 % of the students disagree with the question, 40.7 % of them agree that they can concentrate on their lesson when they use e-learning; 29.6 % agree that they can learn many things when they use the

Table 64.2 The students' attitude towards e-learning adoption

Attitude	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree
I enjoy learning with e-learning	3.70 %	22.20 %	33.30 %	33.30 %	7.40 %
I can concentrate on my lesson when I use e-learning	3.70 %	22.20 %	29.60 %	40.70 %	3.70 %
I can learn many things when I use e-learning	7.40 %	25.90 %	25.90 %	29.60 %	11.10 %
I believe the more often teachers use e-learning, the more I will enjoy school	–	37.00 %	37.00 %	22.20 %	3.70 %
I feel comfortable working with e-learning	–	40.70 %	29.60 %	18.50 %	11.10 %
Working with e-learning makes me nervous	7.40 %	29.60 %	37.00 %	18.50 %	7.40 %
E-learning is difficult to use	3.70 %	33.30 %	37.00 %	22.20 %	3.70 %
E-learning does not scare me at all	3.70 %	33.30 %	25.90 %	37.00 %	–
I can learn more from books than from e-learning	3.70 %	18.50 %	37.00 %	29.00 %	11.10 %

e-learning. Somehow, 37 % of the students are unsure whether they will enjoy school if the teacher would use the e-learning more. Meanwhile, 40.7 % of the students are not comfortable working with e-learning. Somehow, the students felt that the e-learning is difficult to use but they are not afraid of the technology. Up to 37 % of the students are not sure whether they can learn more from books than from e-learning.

The lack of the students' interest in enjoying e-learning is probably due to the facilities provided by the organization. Usually, the number of computers provided in the lab is not enough for the students to use one to one hands-on. The computers are often out of order and the numbers of students are usually more than the number of computers. This has contributed to the bored student's factor as the facilities are the priority to ensure effectiveness in e-learning implementation. When asked whether they can learn more from books than e-learning, the results show that the students are not sure about the situation. It is believed that the students are not comfortable gathering information through the Internet as most of the resources are written in English. The students are rather passive when they are confronted with the language especially in understanding English. Therefore, they prefer to gain the information from books as some of them are written in Bahasa Malaysia. Even though UiTM is practising English as the main medium in communication and lectures, the students chose not to use the language thoroughly. The students' perception is that they will not be using the English language when they graduate and when they are teaching in secondary school.

64.6 Conclusions

From the study conducted, it can be concluded that the students' readiness to adopt e-learning is still average. This scenario happened due to the students' current situation where they are in the process of adapting the learning and teaching via technology. The result does not reflect any negative perception as the e-learning implementation in UiTM was initiated in 2004 and it shows that the technology implementation is still at infant stage. The development and ability to adopt the technology wisely will contribute to an effective e-learning implementation among the students in the higher institution and further supervision and observation from the management is needed to ensure successful e-learning implementation. This is to avoid the static use of technology scenario. From this study, it is hoped that the TPACK framework will be the platform for the students to develop and to enhance their technology literacy as well as to measure their readiness in adopting and understanding e-learning. With the understanding of the technology, the e-learning will be adopted without hesitation. Therefore, the implementation of e-learning will be on the right track and it will be executed wisely in the teaching and learning process in the higher education institutions.

References

- Abdul Nasir, S. J., Mohd. Yusof, M. N., & Syed Hassan, S. H. (2011). *Implementing flexible learning mode in health science programmes – A Malaysian perspective: MARA University of Technology (UiTM) experience*. Commonwealth of Learning and University of London.
- Harun, J., & Tasir, Z. (2003). *Multimedia Dalam Pendidikan*. Kuala Lumpur: PTS Publications & Distributors.
- Jamaludin, R. (2005). *Multimedia Dalam Pendidikan*. Kuala Lumpur: Utusan Publication and Distributors.
- Kaur, K., & Abas, Z. W. (2004). *An assessment of e-learning readiness at the Open University, Malaysia. International conference on computers in education, Melbourne, Australia*. Retrieved from http://teddyso.solvehost.com/Materials/RTC/Ch123_Kaur_An%20Assessment%20of%20eLearning%20Readiness.pdf
- Koehler, M. J., & Mishra, P. (2008). In AACTE Committee on Innovation and Technology (Ed.), *Handbook of technological pedagogical content knowledge (TPCK) for educators* (pp. 3, 5, 12–18). New York/London: Routledge/Taylor & Francis Group.
- Logan, C., Allan, S., Kuriem, A., & Flint, D. (2007). Distributed e-learning in art, design, media: An investigation into current practice. Retrieved July 16, 2008, from <http://www.adm.heacademy.ac.uk/projects/adm-hea-projects/distributed-e-learning-in-art-design-media>
- Mercado, C. (2008). Readiness assessment tool for an e-Learning environment implementation. In Fifth international conference on eLearning for Knowledge-Based Society, Bangkok.
- Mishra, P., & Koehler, M. (2008a). *Education technology and teacher education, the TPACK framework*. A symposium on Education and Technology in Schools, Michigan State University.
- Mishra, P., & Koehler, M. (2008b). *Handbook of technological pedagogical content knowledge (TPCK) for educators*. Routledge/Taylor & Francis Group for the American Association of Colleges for Teacher Education.
- Rosli, M., Ismail, I., Abu Ziden, A., & Baharum, H. (2012). *Malaysian Journal of Distance Education, 14*, 11–23.
- Shidki, B., & Yussof, N. R. N. (2008). *Cabaran Penggunaan ICT Dalam Pengajaran dan Pembelajaran Pendidikan Islam Dalam Pengintegrasian ICT Dalam Pendidikan, Penyelidikan, Amalan dan Aplikasi*. Shah Alam: Karisma Publication.
- Souleles, N. (2011). *E-learning in art and design: Perceptions and practices of lecturers in undergraduate studiobased and the rhetoric of innovative practices*. In 5th international technology, education and development conference Valencia, Spain.
- Yuan, R. (2004). *A probe into learning styles and attitude toward Technology-Enhanced Language Learning (TELL)*, defense language institute. Orlando: University of Central Florida.

Chapter 65

An Innovative Decision Making Style Strategy Framework for Sustainable Leadership Amongst Deans of Public Universities

Leele Susana Jamian, Gurnam Kaur Sidhu, and Parmjit Singh Aperapar

Abstract In the current rapid world of uncertainty and change, a more vibrant leadership of deans in the area of decision making is highly needed in managing academic challenges at the institutions of higher education (IHE). Numerous past studies revealed that managerial decision making style (DMS) is one of the hidden factors which contribute to the success of both managers/leaders and their organisations. Using the Decision Making Styles Inventory (DMSI) developed by Rowe and Boulgarides (1992), this paper aims to explore the deans' DMSI and propose an innovative decision making style strategy framework for sustainable leadership amongst deans of Malaysian public universities. A quantitative method utilizing descriptive research design was employed involving a total of 54 deans from four Malaysian public universities and data was collected via questionnaire using the survey method. The scores derived from the DMSI were categorized into four basic decision styles namely; directive, behavioural, analytical and conceptual (Rowe AJ, Boulgarides JD, Managerial decision making: a guide to successful business decisions. Mc Millan, New York, 1992). The main findings revealed that a majority of the deans scored the *very dominant and dominant* Behavioural style intensity instead of the other three styles. In view of the empirical findings, a proposed innovation on DMS is hoped to be a guideline for future novice deans' best practices and also to enable effective leadership towards an improved organisation in the ever changing and unpredictable global environment.

Keywords Leadership • Decision Making Styles • Deans • Institutions of Higher Education (IHE) • Innovation

L.S. Jamian (✉) • G.K. Sidhu • P.S. Aperapar
Faculty of Education, Universiti Teknologi MARA,
Campus Section 17, 40200 Shah Alam, Selangor, Malaysia
e-mail: leelephd@yahoo.com

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65.1 Introduction

The current rapid world of uncertainty and external changes which take place in the real world have somehow affected the academic landscape of numerous institutions of higher education (IHE) globally (Bensimon and Neumann 1993, as cited in Wolverson et al. 2001). This situation has brought a great impact on the roles and responsibilities of managers cum leaders at all levels in Malaysian public IHE particularly deans as the middle managers. Initially, deans were much regarded as managers of IHE and their duties focused mainly on the administration of students which include managing, planning, budgeting, advocating, fundraising and cultural perspectives (Wolverson et al. 2001). However, with the impact of globalization, internationalisation and the democratization of education, the roles and responsibilities of deans in IHE are far more challenging as they are regarded to act as both managers and leaders of change. Hence, a synergy between these two roles: as a manager and a leader, requires deans of IHE to make numerous decisions in the effort to build effective academic organization.

In such circumstance, the effectiveness of leadership is always being measured. In measuring one's leadership, Boulgarides and Cohen (2001) have applied the leaders' managerial decision making styles inventory (DMSI) as a tool to measure and reflect leadership style. They indicated that leadership style is "a consistent pattern of behaviour displayed by a leader over time" (p. 1). Thus, based on past empirical research, both scholars disclosed that "a leader's style is reflected in his style of decision making" (p. 1). In the same vein, Jones (2005) highlighted that decision making is one of the essential competency components in leadership. He noted that both decision and decision-making processes are explicitly "fundamental to all leadership and management processes" (p. 121). In relation to leadership, Drucker (1967, as cited in Harrison 1999) stated that what determines an effective organization will always fall back to an effective leader who is also an effective decision-maker.

Besides the above, researchers such as Leonard et al. (1999) also agreed that decision making serves as the fundamental function in any organizations. This is because the quality of decisions made would influence the effectiveness of the managers and eventually, this would affect the success of the whole organization. Likewise, Hammond (1999) advocated that the success in all the roles orchestrated by a manager in an organization reflects decisions that he or she made. Above all, Rue and Byars (2000) stated that a manager must first be a good decision maker before he or she could be a good planner, organizer or leader regardless in any organization.

As of today, study on managerial decision making style has been commonly investigated in relation to organizational performance amongst corporate managers and leaders in private and business organizations worldwide. In fact, there are also a number of studies carried out amongst school principals at school levels globally but little has been conducted in the Malaysian public university setting particularly amongst deans. Considering the fact that ones' decision making could affect the effectiveness of an organization, this paper aims to explore the deans' DMSI and

propose an innovative decision making style strategy framework for sustainable leadership amongst deans of Malaysian public universities.

65.2 Background

Decision making styles (DMS) are referred to as “the way in which a manager perceives information and mentally process that information to arrive at decisions” (Rowe and Boulgarides 1992, p. 28). These scholars affirmed that there is a need to measure DMS since “individual’s decision styles form the backbone of effective decision making” (p. 22). Drucker (1966, as cited in Rowe and Boulgarides 1992) accentuated that effective decision-maker will try to concentrate only on few important decisions, to search for what is constant in a situation, and to think through what is strategic and generic rather than to solve problems. Above all, the notion of style flexibility has given more dominant effect rather than one best style only. This is because a flexible style can be matched to suit the change in a specific situation, thus improve effectiveness. Further, DMS helps to probe the psychological structure of the mind and displays how a person thinks differently based on his or her perceptions and values.

Decision making style inventory (DMSI) employed in this study was based on four driving forces and situations confronting decision-makers as developed by Rowe and Mason in 1987. The scores derived from the inventory will categorize decision-makers into four basic decision styles namely: Directive, Behavioural, Analytical and Conceptual styles. In an absolute sense, decision styles are the tabulated scores that one receives after answering a set of questions in the DMSI. Measuring individual’s style pattern is important since this would predict how one will react to various situations. In fact, in a relative sense, DMSI is the “way” where style is utilized based on decision making situations. Both researchers added that effective decision-makers are the ones whose style matches the requirements of decision situations. With this understanding, DMS are seen as relevant variable to be measured since it reveals implication as to whether academic managers do have considerable flexibility or rigidity in changing their DMS based on situation warrants (Rowe and Boulgarides 1992). Thus, this paper attempts to reveal findings on deans’ decision making styles according to DMS model and subsequently propose an innovative decision making style strategy framework for sustainable leadership amongst deans of public universities in Malaysia.

65.3 Statement of the Problem

To date there has been scant empirical research concerning deans in Malaysian IHE. Amongst the studies conducted on deans is the *Profiles of Deanship in Malaysian Public Universities* (Parmjit et al. 2009). These researchers reiterated

that much literature agreed that deans should be able to lead and above all possess management skills in order to navigate effective academic organizations. However, the study revealed that both deans and deputy deans along with heads of departments, ranked decision-making skills as the highest management competency required by deans. This is followed by other management skills such as communication, problem-solving, interpersonal, public relation, negotiation and ICT skills consecutively (Parmjit et al. 2009). Even though this study managed to illuminate empirical data on the most needed management skills amongst deans of public universities in Malaysia, little is known concerning their managerial decision making styles and skills.

Past literature had claimed that the effectiveness of a manager would give impact to either the success or failure of an organization (Alqarni 2003; Leonard et al. 1999; Yulk 1994; Barnard 1938). Thus, many empirical studies in the area of leadership particularly the managerial decision making were conducted and tested using different models of decision making. As early as in 1975, Harrison accentuated that decision theory was a relatively new field and again in 1999, Harisson stated that decision theory as in “the academic discipline is relatively young” (pg. 9). Most of the earlier decision making orientations were found to have strong quantitative emphasis which focuses on the “decision itself rather than the process within the choice takes place” (Harisson 1996, pg. 16). In relation to this, few theories of decision making were constructed, built and tested by numerous leadership researchers in the quest to search for empirical evidence. However, a dispute between rational and cognitive decision making models used in decision making investigation was identified as a heated and debatable issue amongst scholars in decision-making related area.

Hambrik (1987) stated that the rational models of decision making have often ignored the characteristics of individual decision-makers, and presumed that information processes and arriving at a decision process are rather similar in all individuals. Bourgeois and Eisenhardt (1988), and Rajagopalan et al. (1993, as cited in Leonard et al. 1999) affirmed that the rational models have somehow ignored the actual decision process and how individual differences affect that process. In the same vein, Hoy and Miskel (2005) added that the structure of decision making process in rational models is rather similar in all individuals regardless of the types of organizations be it in the military, educational or industrial organization. In short, most scholars in decision making related area advocated that the universality of the rational models in decision making is the same regardless the specific context or task. Correspondingly, even though educational organizations are different from any profitable organizations in a great many essential ways, decision making process is assumed to be similar regardless of individuals and organizations.

On the other hand, as a result of the severe limitations of the classical models in the rational decision making models, the evolution of theory in decision making continues to take place. When cognitive decision making model or also known as cognitive style came into being, Eisenhardt and Zbaracki (1992, cited in Leonard et al. 1999) indicated that the rational models are somehow contradicted to the cognitive models. They argued that observations over the actual decision making

situations revealed decision making behaviour is typified by numerous differences in many fields such as the number of criteria used, type of information searched, sources of information used, number of alternatives generated and the use of heuristics in making decision. Thus, they concluded that fundamentally cognitive decision model is based upon individuals' characteristics that are link to individuals' differences in decision behaviour and decision process information. As numerous investigations in cognitive style emerged, exploration on leadership attributes particularly decision making styles became prominent and timely. Due to the differences of both decision models, the researchers believe that the cognitive decision model could provide a better platform in understanding ones' leadership in terms of their decision styles rather than the universality of ones' rational decision skills. Having to consider both models, the researchers embarked on the managerial decision styles based on the cognitive decision model.

65.4 Literature Review

Due to complexities and variations, Rowe and Mason (1987; as cited in Jacoby 2006) proposed the term decision making style (DMS) as "the way a person uses information to formulate a decision" (p. 5). In fact, they further emphasized that DMS is still a cognitive process which encompasses one's personality that is highly correlated to one's needs, values, and self-concept. Rowe and Boulgarides (1992) asserted that "individual decision making styles form the backbone of effective decision making" (p. 22). However, due to the complexity of individuals, one may not expect organizational leaders to "neatly fit into only one category of decision making style" (p. 31). Indeed, typical organizational leaders have at least one dominant style with at least one and often two back-up styles. Therefore, the notion of one best style may not be ideal and this has been replaced with the idea of style flexibility that can be modified to suit a specific situation. According to management scholars, the flexibility in decision making style apparently can improve effectiveness.

65.4.1 *Rowe and Mason's Decision Making Style Inventory (DMSI)*

Decision Making Style Inventory (DMSI) was developed in 1987 by Alan Rowe and Richard O. Mason. Rowe and Boulgarides (1992) clarified that decision making styles (DMS) build on two key elements: values and perception. DMS describes the way managers make decisions. It involves factors such as the context in which decision is made, the way the managers perceive and understand cues, and what managers value and judge as essential. In short, DMS reflects the manner in which managers react to a given situation. This includes how managers interpret and

understand cues, what managers believe and how they respond to numerous demands and forces. The theorists above stated that DMS can be measured using an instrument called the decision making style inventory (DMSI) which probes the psychological structures of one’s mind.

A complete decision-style model by Rowe and Mason in 1987 (as cited in Rowe and Boulgarides 1992) reflects a person’s cognitive complexity and values. Figure 65.1 indicates the model which describes an individual’s personality, self-competence, interpersonal competence, situation awareness and problem-solving capability. This model is divided into four styles namely: Directive, Analytical, Conceptual and Behavioural styles. DMS model has two components such as cognitive complexity and values orientation. The lower half of Fig. 65.1 indicates Directive and Behavioural styles preferred structure and the upper half preferred complexity. Based on the figure too, the values dimension separates the left and right halves and covers task and people dimensions. The left half of the figure indicates the Analytic and Directive styles that prefer task. The right half indicates the Conceptual and Behavioural styles that preferred people. Description of each style is also presented as below.

Directive Style is characterized by autocratic and internal orientation. Individuals with this style have low tolerance for ambiguity and low cognitive complexity. The focus is on technical decisions which involve a need for speed, efficiency and limited alternatives. They prefer specific information to be given verbally and like to dominate others. They are also results-driven yet constantly search for security and status, focused, structured, aggressive and rigid managers. Their orientation towards the internal organization is always short range with tight controls.

	Left hemisphere (logical)	Right hemisphere (relational)	
Complexity	Analytical Enjoys problem solving Wants best answers	Conceptual Is achievement-oriented Has a broad outlook	Leaders Thinking (Ideas)
Tolerance For ambiguity	Wants best control Uses considerable data Enjoys variety Is innovative Uses careful analysis	Is creative Is humanistic/artistic Initiates new ideas Is future-oriented	
Cognitive Complexity	Directive Expects results Is aggressive Acts rapidly	Behavioural Is supportive Uses persuasion Is empathetic	Managers Doing (Action)
Need for Structure	Uses rules Uses intuition Is verbal	Communicates easily Prefers meetings Uses meetings Uses limited data	
	Task/Technical	People /Social	
	Values Orientation		

Fig. 65.1 Complete decision style model by Rowe and Mason (1987, as cited in Rowe and Boulgarides 1992)

Analytical Style is characterized by an autocratic bent. Individuals with this style have a much greater tolerance for ambiguity and more cognitive complex personality. They need more information and consideration for alternatives since they focus on technical decisions. They are typified by the ability to cope with new situations, enjoy more problem solving and always strive to achieve the maximum. Position and ego seem to be important characteristics and they often reach top posts in a company or start their own company since they need more control. However, they are not rapid in decision making but enjoy variety and prefer written reports. They also welcome and enjoy challenges and examine every detail in a situation.

Conceptual Style is characterized by high cognitive complexity and people orientation. Typically, individuals under this category are thinkers rather than doers. Hence, there is trust and openness in relations. They share goals with subordinates, tend to be idealists, and emphasize more on ethics and values. They are also creative and can readily understand complex relationships. They tend to use data from numerous sources and consider many alternatives. They focus on long range with high organizational commitment. They are achievement-oriented, value praise, recognition and independence. They prefer loose control to power and exhibit participation.

Behavioural Style Is characterized by supportive and friendly orientation (concerned with subordinates' well being and are people-oriented). Individuals with this style have a low cognitive complexity scale but they have deep social concern for organizations and development of people. They normally provide counselling, are receptive to suggestions, communicate easily, portray warmth, empathetic, persuasive, compromising and accept loose control. They focus on short term range and uses meetings for communicating. They tend to avoid conflict, seek acceptance but sometimes are insecure.

The amount that each of the DMS intensity is used can be determined from the score specified on the decision making style inventory (DMSI). There are four levels of intensity namely: (1) *Least preferred* level of intensity which indicates that the individual rarely uses the style but when required could do so, (2) *Back-up* level of intensity which indicates that the individual will use the style occasionally and reflects the typical score on the decision style inventory, (3) *Dominant* level of intensity which indicates that the individual will frequently use this style in preference to other styles (however, in general, individuals can have more than one dominant style and they can also switch from one to another) and (4) The *Very dominant* level of intensity which indicates the highest level that describes the compulsive use of the style preferred by individuals. This level of intensity becomes the focus of individuals and will override other styles that have less intensity level (however, there are individuals who do have more than one very dominant style). Table 65.1 is used to determine the level of intensity as well as interpreting the scores for an individual's style based on the scores obtained on the DMSI instrument. The instrument consists of 20 questions. Each question consists of 4 responses that concern typical situations facing managers. Respondents are to rank behaviours in each question using the scale of 8, 4, 2, and 1. A ranking of 8 indicates the response is *most like you*, 4 indicates *moderately like you*, 2 indicates *slightly like you* and 1 indicates *least like you*.

Table 65.1 Decision Making Style Intensity (DMSI) Levels (Rowe and Boulgarides 1992)

Style	Intensity Levels			
	Least preferred	Back-up	Dominant	Very dominant
Directive	Below 68	68 to 82	83 to 90	Over 90
Analytic	Below 83	83 to 97	98 to 104	Over 104
Conceptual	Below 73	73 to 87	88 to 94	Over 94
Behavioural	Below 48	48 to 62	63 to 70	Over 70

65.4.2 *The Nature of Decision Making in the Educational Management*

Lunenberg and Ornstein (2004) emphasized that all decisions result in some influence on the performance of the faculty and students (p. 182). Therefore, educational managers must develop their decision making aspect such as decision styles and skills for they make many decisions which eventually affect the whole working organization. Further, educational managers are also being evaluated on the results of their administrative decisions. In this case, the quality of the decisions is crucial in evaluating their effectiveness. The quality of numerous decisions made will not only reflect an impact to the clients but above all, will transcend the values held by educational managers who represent the educational organization.

Next, the decline in the world ranking of Malaysian universities in the past few years has gained major attention of all stakeholders including students, administrators of higher education, the government, academicians and even the public. With the deteriorating state of Malaysian public universities, the issue of quality decision making particularly by the heads (deans) has been identified as one of the potential area that need to be investigated. A study conducted by Nik Maheran indicated that indirectly, the issue has to do with the management of IHE. She encourages top managers in universities to be more democratic leaders than autocratic ones and ensures the “reform undertaken deliver the right prescriptions for the well known weaknesses or shortcomings” (2009, p. 4) This is mainly due to the reason that the autocratic leadership style in IHE may create poor management and indirectly lead to poor decisions. Eventually, all these may lead to the falling standard of IHE in Malaysia (Magoha 2004).

65.5 Methodology

A survey using the questionnaire of managerial Decision Making Styles Inventory (DMSI) which was developed by Rowe and Mason (1987) was used to measure and identify deans’ managerial decision making styles in four randomly selected Malaysian public universities. 60 sets of questionnaires were sent to all 60 deans from the four randomly selected Malaysian public universities. The population

sample consisted of two research intensive and two non-research universities. Questionnaires were sent via the drop-off survey method where it allows the respondents to answer the survey at their own convenience. The strength of this method as compared to the traditional mail survey, is that it allows the researcher to make personal contact with the respondents, to explain the importance of the survey, and to answer any questions or concerns the respondents might have. Out of these 60 deans, 90 % (n=54) completed and returned the questionnaires. Thus, this study aims to explore the following research questions: What are the managerial decision making styles intensity (DMSI) levels amongst deans of public universities in Malaysia?

65.6 Results and Discussions

65.6.1 Deans' Managerial Decision Making Styles Intensity (DMSI) Levels Profile

Table 65.2 indicates findings on Deans' managerial Decision Making Styles Intensity (DMSI) levels Profile. It is apparent that amongst all the four decision making styles, 31.5 %, (n=17) of the deans scored within the *very dominant* and 24.1 % (n=13) scored within the *dominant* DMSI levels of Behavioural decision style. When these results were combined, they form the biggest percentage and number of deans (55.4 %, n=30) hence suggesting that more than half of the deans of public universities in Malaysia perceived themselves as Behavioural decision-makers. The findings also revealed that 42.6 % (n=23) and 33.3 % (n=18) of the deans are more likely to employ Analytical and Conceptual decision styles as their *back-up*. In addition, 50 % (n=27) and 44.4 %, (n=24) of the deans indicated that their *least preferred* decision making styles would be Directive and Conceptual styles.

These findings suggest that more than half of the deans were dominantly Behavioural decision-makers. However, it is also important to note that many of them are able to switch to Analytical and Conceptual decision styles as their *back-up*. Half of them do not embark on Directive decision style as it recorded the *least preferred* decision style. Overall, these findings imply that many of the deans are flexible decision-makers who do not confine themselves to only one style (which reflects rigid decision-makers). This is in line with the theory put forward by Rowe

Table 65.2 Deans' managerial DMSI profile (frequency and percentage)

Managerial decision style	Least preferred	Back-up	Dominant	Very dominant	Total
Behavioural	10 (18.5 %)	14 (25.9 %)	13 (24.1 %)	17 (31.5 %)	54
Analytical	17 (31.5 %)	23 (42.6 %)	7 (13 %)	7 (13 %)	54
Conceptual	24 (44.4 %)	18 (33.3 %)	7 (13 %)	5 (9.3 %)	54
Directive	27 (50 %)	15 (27.8 %)	7 (13 %)	5 (9.3 %)	54
Total	78 (36.11 %)	70 (32.41 %)	34 (15.74 %)	34 (15.74 %)	216 (100 %)

and Boulgarides (1992) which indicates that as managers they are rather flexible in their decision styles and are able to change and suit their decision styles from one particular situation to another with little difficulty.

Rowe and Boulgarides (1992) characterized Behavioural decision-makers as those who formulate decisions based on their cognitive process which are usually deeply rooted in people-orientation and have social concerns for organization. This implies that more than half of the deans' decision style is mainly based on people-relations which require more personal attention rather than intellectual aspect. Nevertheless, the scholars also emphasized that those who adopted Directive and Behavioural styles are action-oriented and they operate as first-line managers. However, they highlighted that the upper levels of managers who adopt the Behavioural decision style are often "seen as being inconsistent, and leave their subordinates in a weak position because they cannot be sure of what to expect" (pg. 34). Based on this statement, it can be inferred that the dominance of Behavioural decision style amongst deans in this current study should be highlighted since deans are regarded as the top academic managers who lead the academic organization which requires consistency in their academic performance.

Nonetheless, when compared to studies pertaining to decision styles at a global level, the current study portrays rather similar results with those involving the educational setting using the same instrument. For instance a study by Abdulrahman AlQarni (2003) entitled "The Managerial Decision Styles of Florida State University Library Managers" indicated that the majority of Florida university libraries' managers (n=40 or 47 % out of 85 respondents) scored within the *very dominant and dominant* Behavioural DMSI levels and was followed by Conceptual decision style (n=28 or 32.9 % out of 85 respondents). A similar result was also reported in a recent doctoral thesis by Ismail Hussein Amzat (2010). His study involving 1117 university teaching staff investigated decision making styles and their relationship with Job Satisfaction in five Malaysian public universities. The findings indicated that three out of the five public universities in Malaysia had actually displayed the Behavioural decision style, while the remaining two had displayed the Analytical and Conceptual decision styles.

65.6.2 Deans' Managerial Decision Style Patterns: Brain-Sidedness and Person-Orientations

According to the Complete Decision-Style Model (Rowe and Boulgarides 1992) findings on decision making style patterns should also be interpreted according to ones' brain-sidedness and person-orientations. Brain-sidedness which covers task/people dimensions reflects the values dimension in a person while, person-orientations which cover idea/action, complexity/structure and leaders/managers reflect the cognitive perspective of a person (Zaleznick 1970 as cited in Rowe and Boulgarides 1992).

Table 65.3 Basic decision style patterns scoring

Patterns	Styles	Score
Left brain	Directive & Analytical	165 or higher
Right brain	Conceptual & Behavioural	135 or higher
Idea orientation	Analytical & Conceptual	170 or higher
Action orientation	Directive & Behaviour	130 or higher

Rowe *Note*: From Rowe and Mason (1987)

The combination of scores between directive and analytical decision styles (165 or higher) would result in the left-brained dominants. Whereas, the combination of the conceptual and behavioural decision scores (135 or higher) would result in the right-brained dominants. On the other hand, the combination between analytical and conceptual decision scores (170 or higher) would result in the idea-oriented dominants whereas the combination between directive and behavioral decision scores (130 or higher) would result in the action-oriented dominants (Rowe and Mason 1987). Table 65.3 summarizes the measurement of the style patterns that categorizes both the brain-sidedness and person-orientations aspects.

The findings shown in Table 65.4 indicates that 64.8 % (n=35) of the deans rated themselves as dominantly right-brained (combined scores of conceptual and behavioural styles) while the remaining 35.2 % (n=19), rated themselves as dominantly left-brained (combined scores of directive and analytical styles).

The findings shown in Table 65.5 indicates that 59.3 % (n=32) of the deans rated themselves as dominantly action-oriented (combined scores of directive and behavioural styles) while the remaining 40.7 % (n=22), rated themselves as dominantly idea-oriented (combined scores of analytical and conceptual styles).

65.7 Implications

Findings on deans' DMSI levels revealed that more than half of the deans rated themselves within the *very dominant* and *dominant* Behavioural, *back-up* Analytical and the *least preferred* Directive and Conceptual DMSI levels. Concurrently, findings also indicated that many deans perceived themselves as flexible decision-makers when they occasionally rated few other styles as their *back-up* and the *least preferred* DMSI. A few implications can be derived from the findings.

First, the exploration of managerial DMS amongst deans is essential since findings help to illuminate the current leadership practices of deans at Malaysian public universities. It is also important to note that the majority of deans can be said to be rather flexible in their decision styles as they are able to change and suit their decision styles from one particular situation to another with little difficulty since majority of them rated one or two *very dominant* or *dominant* DMSI levels along with one or two *back-up* DMSI levels. Second, the findings are valuable since they help researchers to chart a strategic leadership course amongst deans towards academic

Table 65.4 Brain-sidedness as rated by Deans

	Frequency	Percentage
Right-brain ^a	35	64.8
Left-brain ^b	19	35.2
Total	54	100.0

^aScoring guide: left-brained = directive + analytical = 165 or higher

^bScoring guide: right-brained = conceptual + behavioural = 135 or higher

Table 65.5 Person-orientations as rated by Deans

	Frequency	Percentage
Idea-orientation ^a	22	40.7
Action orientation ^b	32	59.3
Total	54	100.0

^aScoring guide: idea-orientation = analytical + conceptual = 170 or higher

^bScoring guide: action-orientation = directive + behavioural = 130 or higher

effectiveness. Rowe and Boulgarides (1992) highlighted that an effective manager is the one who has a combination of Directive and strong *back-up* Behavioural DMS. The combination of both styles lead to an *action-oriented* manager. Nevertheless, findings from this study indicated that more than half of the deans possessed the *very dominant* and *dominant* Behavioural DMSI instead of a mixture of a few decision styles. Hence, these empirical findings cannot be used as a benchmark for the training of novice deans of public universities in Malaysia. Instead, what can be recommended is training be provided to expose deans to the various decision styles and strategies on how these styles could shape them to be not only effective managers but leaders in the academic management setting. Rowe and Boulgarides (1992) disclosed that for researchers, the exploration of managerial DMS reflect ones' leadership which helps to form and strengthen relationship of a manager-to-a-group. Thus, training in managerial DMS is relevant and highly recommended. In view of the implications, an innovative decision making style strategy framework is suggested and forwarded as part of the training purposes.

65.8 An Innovative Decision Making Style Strategy Framework

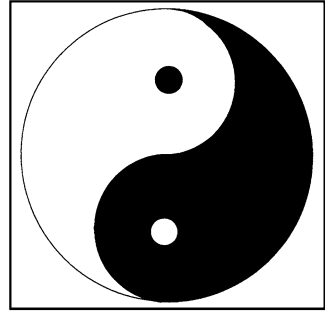
Based on the findings and implications presented above, an innovative decision making style (DMS) strategy framework is proposed for sustainable leadership amongst deans of public universities in Malaysia as part of the second aim of the current study. On the overall, the main findings revealed that the majority (55.4 %, n = 30) of the deans rated themselves as the *very dominant and dominant* Behavioural

decision-makers instead of the other three styles. Further, 64.8 % (n=35) of deans rated themselves as dominantly right-brained based on the combined scores of conceptual and behavioural styles while the remaining 35.2 % (n=19) rated as dominantly left-brained based on the combined scores of Directive and Analytical styles and lastly 59.3 % (n=32) of deans rated themselves as dominantly action-oriented based on the combined scores of Directive and Behavioural styles (indicating deans as managers) and the remaining 40.7 % (n=22) rated themselves as dominantly idea-oriented based on the combined scores of analytical and conceptual styles (indicating deans as leaders). In view of these findings, an innovative DMS strategy framework is presented which derived from the Chinese ancient philosophical theory known as the Yin-Yang balance.

Generally, it can be observed that most of the empirical findings rated by the deans tend to be skewed in many ways. Hence, an innovative decision making style strategy framework is proposed by looking into the basic principle of dualism in the Yin-Yang balance. Sodan (1998) stated that the Yin-Yang system (Fig. 65.2) shows the two parts of the symbol for Yin (black portion) and Yang (white portion) correspond to the right side of the body controlled by the left brain whereas the left side controlled by the right brain. Both parts are mirror-inverted and of the same size representing the same value, balance and significance. The wavy division between the two parts shows their interaction and phases and the small circles of the opposite colours indicate that the pole is inherent too. He further clarified that the Ying-Yang system is considered as the source of creativity and regarded as the basis of harmony. Further, the Yin-Yang system postulates numerous pairs in the universe which come in two sides of dualism or also known as dichotomy. However, in a more concrete term, dichotomies found in the Yin-Yang system tend to “agree perfectly with those of brain research, the left brain corresponding to Yang, the right brain to Ying” (Sodan 1998).

In regards to the above, the researchers strongly believe that the middle managers such as deans of public universities in Malaysia need to be informed that managing the Yin-Yang concept in decision making is something that most of them need to do all the time since they have to act interchangeably as both managers and leaders. Fundamentally, it is imperative to acknowledge that knowing how the Yin-Yang system works could greatly help many deans to be better decision-makers and take control of reality. Indeed, when Rowe and Mason generated the complete managerial DMS model in 1992, both researchers had established the concept of the left and right brain dominance as part of the groundwork of the model. However, not many realize and practise the balance of both brains in their managerial DMS. Hence, it is timely to introduce an innovative decision making style strategy framework which could strengthen the deans’ managerial DMS. A diagram shown in Figs. 65.2 and 65.3 shows the integration of the Yin-Yang balance concept embedded in the initial managerial decision styles model (which has been adjusted from the original model as shown in Figs. 65.1 and 65.2).

Fig. 65.2 The symbol of Yin-Yang balance



Perhaps the integration of the Yin-Yang balance concept could strengthen and further sustain the deans' leadership in the ever changing and unpredictable contemporary environment. Having to learn and practice the balance of the four managerial DMS such as Directive, Behavioural, Analytical and Conceptual (based on the Rowe and Boulgarides DMS model, 1992) in various academic situations would help deans to be effective decision-makers. When findings revealed that deans tend to rate themselves as dominantly right-brained decision makers rather than dominantly left-brained, this indicates that deans embraced and practised more intuition rather than rational decision making style. Thus, past researchers such as Ornstein (1975), George and Ellis (1982), Birt (2010) mentioned that most American managers are found to be left-brain dominants. George and Ellis (1982) accentuated that robust development of science and technology in Western countries has resulted in educational system focusing exclusively more on the left-brain hemisphere functions as in reading, arithmetic, science and scientific applications. Due to the over-emphasizing of the left-brain dominance, many researchers such as Lindblom (1959), Ackoff (1974), Kuhn (1970), Adam (1979), Barrett (1979) and Feyerebend (1980, as cited in George and Ellis 1982) warn the danger of over emphasizing the left hemisphere capabilities particularly the rational approach. Likewise, the same scenario was found amongst deans of public universities in Malaysia when a majority rated themselves as the right-brain dominants. Hence, this would lead to some imbalances of the 'ecosystem' in their managerial DMS which could give impact to the academic organizations such as universities in Malaysia (Fig. 65.3).

In addition, when more than half of the deans rated themselves as dominantly action-oriented indicating deans as managers than dominantly idea-oriented indicating deans as leaders, more trainings and information need to be disseminated to deans that less micro-management should be practised. Indeed, trainings which encompass formal knowledge on the role of both managers and leaders, and how they should practise the managerial decision styles in academic organization is deemed important. This is to ensure that the dualism roles; as managers and leaders, in the academic administration and management setting could be fully distinguished and practised successfully by deans in Malaysia particularly.

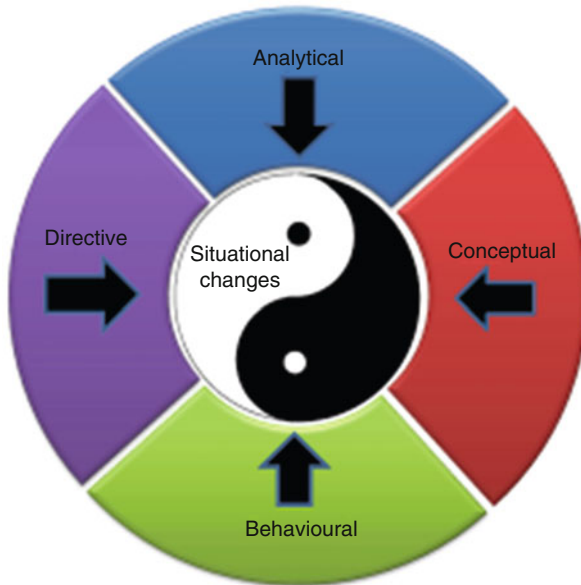


Fig. 65.3 An innovative decision making style strategy framework for sustainable leadership amongst deans of public universities

65.9 Conclusion

The current paper aims to explore the managerial Decision Making Styles (DMS) of 54 deans from four randomly selected Malaysian public universities which corresponded to the complete human cognitive model brought by Rowe and Mason. In addition to the empirical research, the current paper also aims to propose an innovative decision making style strategy framework for sustainable leadership amongst deans of Malaysian public universities. On the overall, the main findings revealed that the majority of the deans rated themselves as the *very dominant and dominant* Behavioural decision-makers instead of the other three styles. Further, more than half of deans rated themselves as dominantly right-brained while the remaining rated as dominantly left-brained and lastly findings also revealed that more than half of deans rated themselves as dominantly action-oriented based on the combined scores of Directive and Behavioural styles indicating deans as managers and the remaining rated as dominantly idea-oriented indicating deans as leaders. In view of these findings, an innovative DMS strategy framework is presented which derived from the Chinese ancient philosophical theory known as the Yin-Yang balance as part of the measure to sustain leadership in the area of decision making styles amongst deans of public universities.

References

- Abdulrahman Alqarni. (2003). *The managerial decision styles of Florida's State University libraries' managers*. Unpublished doctoral dissertation. The Florida State University. Retrieved July 1, 2007, from <http://www.worldcat.org/title/managerial-decision-styles-of-floridas-state-university-libraries-managers/oclc/54616665>
- Barnard, C. (1938). *The functions of the executives*. Cambridge: Harvard University Press.
- Birt, T. (2010, January 28). *Connecting brain dominance and learning capabilities*. Retrieved December 22, 2010, from <http://ezinearticles.com/?Connecting-Brain-Dominance-and-Learning-Capabilities&id=3657378>
- Boulgarides, J. D., & Cohen, W. A. (2001). Leadership style vs. leadership tactics. *The Journal of Applied Management and Entrepreneurship*, 6(1), 59–73.
- George, J., & Ellis, Jr. (1982). Using awareness of brain sidedness to build more effective teams. *Journal of Management Education*, 7, 33.
- Hambrik, D. C. (1987). Top management teams: Key to strategic success. *California Management Review*, 3, 88–108.
- Hammond, J. S. (1999). *Smart choices*. Boston: Harvard Business School Press.
- Harrison, E. F. (1999). *The managerial decision-making process*. New York: Houghton Mifflin Company.
- Hoy, W. K., & Miskel, C. G. (2005). *Educational administration. Theory, research and practice*. Boston: McGraw Hill.
- Ismail Hussein Amzat. (2010). *Management and decision making styles and their relationship with academic job satisfaction in some Malaysian public universities*. Doctoral thesis, University of Malaya.
- Jacoby, J. M. (2006). *Relationship between principals' decision making styles and technology acceptance and use*. Doctoral thesis, University of Pittsburgh, 2006. Retrieved August 31, 2010, from http://etd.library.pitt.edu/ETD/available/etd-01022007-223237/unrestricted/jacobyjm2_etdPitt2006.pdf
- Jones, J. (2005). *Management skills in schools*. London: Paul Chapman Publishing – A SAGE Pub. Co.
- Leonard, N. H., Scholl, R. W., & Kowalski, K. B. (1999). Information processing style and decision making. *Journal of Organizational Behavior*, 20(3), 407–420.
- Lunenburg, F. C., & Ornstein, A. C. (2004). *Educational administration. Concepts and practices* (4th ed.). Belmont: Thomson Wadsworth.
- Magoha, P. W. (2004). A critique for the modernization of management in higher education institutions of developing nations. *World Transactions on Engineering and Technology Education*, 3(1), 105–110.
- Nik Maheran Nik Muhammad, Filzah Md Isa, Siti Norezam Othman & Rosli Abdul Rahim. (2009). *Decision making quality of higher education institution leaders in Malaysia: Leadership style, decision style, managerial process and competitive intensity relationships*. Research Report for the Akademi Kepimpinan Pengajian tinggi (AKEPT), Kementerian Pengajian Tinggi Malaysia. Retrieved November 30, 2010, from <http://www.nikmaheran.com>
- Ornstein, R. (1975). *The psychology of consciousness*. New York: Pelican Book.
- Parmjit, S., Sidhu, G. K., Chan, Y. F., Dahan, H. M., Ashari, H., Aini, S. K., & Jelas, Z. M. (2009). Profiles of deanship in Malaysian public universities. *Asian Journal of University Education*, 5(2), 1–26.
- Rowe, A. J., & Boulgarides, J. D. (1992). *Managerial decision making: A guide to successful business decisions*. New York: Mc Millan Publishing Company.
- Rowe, A. J., & Mason, R. O. (1987). *Managing with style: A guide to understand, assessing, and improving decision making*. San Francisco: Jossey-Bass Publisher.
- Rue, L. W., & Byars, L. L. (2000). *Management, skills and application*. New York: McGraw Hill.

- Sodan, A. C. (1998, April). Yin and Yang in Computer science. *Communication of the ACM*, 41(4), 103–114. New York.
- Wolverton, M., Gmelch, W., Montez, J., & Nies, C. (2001). *The changing nature of the academic deanship*. *ERIC Digest*. Retrieved November 29, 2010, from <http://www.ericdigests.org/2001-4/deanship.html>
- Yulk, G. A. (1994). *Leadership in organization*. New York: Prentice Hall.

Chapter 66

Because I'm Happy: Investigating the Effects of a Social Outreach Project on Happiness Among ESL Learners in a Malaysian Private University

Sujatha Krishnan, Simon John Williams, Mohd Ridhwan Abdullah, and Persis Dineen Rodrigues

Abstract Understanding what promotes happiness in students may help educators to create projects that increase it. This paper investigates the effects on happiness by engaging students in a social outreach project. The students are those enrolled into the Intensive English Programme (IEN) at Taylor's University, a premier Malaysian private university. IEN is an immersion language course for students to improve their English language proficiency. With the emergence and increase in interest in positive psychology, a number of instruments are now available to measure subjective well-being (SWB) constructs. The Oxford Happiness Questionnaire (OHQ) includes a new 6-part Likert scale and improved psychometrics that further allows the instrument to be used by a wider audience. Twelve questionnaire items in the OHQ have a reverse Likert scale scoring system to ensure accuracy. The OHQ was administered at the outset and end of the course to measure happiness levels among the participants. For this study, participants that were involved were Malaysians and international students coming from diverse cultural backgrounds and language proficiency levels. The study was conducted for a duration of 2 months, to compare the students' responses before and after the project. The data gathered was tabulated using Statistical Package for the Social Sciences (SPSS) software. Additionally, interviews with their teachers were conducted to substantiate the quantitative data.

Keywords Happiness • Project-based learning • Social outreach • Positive psychology • ESL

S. Krishnan (✉) • S.J. Williams • M.R. Abdullah • P.D. Rodrigues
Centre for Languages, Taylor's University,
Lakeside Campus, No. 1, Jalan Taylor's, 47500 Subang Jaya, Selangor, Malaysia
e-mail: Sujatha.Krishnan@taylors.edu.my; SimonJohn.Williams@taylors.edu.my;
MohdRidhwan.Abdullah@taylors.edu.my; PersisDineen.Rodrigues@taylors.edu.my

66.1 Introduction

A common method in recent years has been for universities to administer a questionnaire to students in order to assess their satisfaction with various aspects of academic life. With this information universities are then able to mine the data and create procedures that can be used to improve their service. A recent survey in the United Kingdom by the National Student Survey (NSS) stated that student satisfaction had increased by almost 5 % from 2005 to 2013 (Callender et al. 2014). This finding is further substantiated by a national report by the Higher Education Policy Institute (HEPI), where they confirm the high levels of satisfaction among university students. Nevertheless, HEPI, for the first time, included a set of questions on wellbeing to ascertain the happiness and satisfaction of university students. In their findings they state, "... that students generally have lower levels of wellbeing than the general population is of some concern." (Soilemetzidis et al. 2014, p. 10), which in some cases is a difference of 10 %. This also mirrors an early study where Kadison cited the results of a national study on depression where it was found that 45 % of 13,500 students reported depression, which led to reduced performance (Kadison 2005). Seligman states that, "it's a paradox; the wealthier we get the more depressed young people get" (Alex Linlev et al. 2006, p. 26). This highlights that we are living in a different era presently with students that have different needs and are under new forms of stress that we should all be aware of.

To encourage well-being among students at a private university in Malaysia, a social outreach project was initiated with the aims of introducing students to a real-world project-based learning outcome. For this study, the hypothesis that will be tested is that a learner's happiness will increase after the completion of a social outreach project.

The research seeks to address the following questions:

1. Does a social outreach project increase happiness levels among students?
2. Are there any marked differences in the state of happiness before and after the social outreach project?

66.2 Literature Review

66.2.1 *Effects on Academic Achievement*

The introduction highlighted that there is now evidence to support findings that students may have low levels of well-being. This could manifest itself as stress due to workload, learning environment, or even first language (Andrews and Chong 2011). If stress is indeed one of the root causes, it could have detrimental effects on a student's learning potential. In a review of the role of neuroscience in education,

Goswami (2004) addresses the issue of stress and the effects that it has on a student's ability to learn, and states that stress can impair learning in terms of reasoning, problem-solving, and social judgements. Therefore, could increasing well-being in terms of happiness reduce stress to benefit learning?

In a study on behaviour and wellbeing on educational outcomes, Gutman and Vorhaus (2012) found that students with higher levels of wellbeing are on average more engaged in secondary school; progress more in primary school; and have higher levels of academic achievement. Though the study looked at wellbeing in terms of emotional, social, behavioural and school wellbeing, the study also highlighted the importance of wellbeing for a student's development as far back as primary school to the early stages of high school. Additionally, Andrews and Chong (2011) investigated the stress levels of university students in Australia during low and high stress periods of the academic semester. From the 5,000 students who completed the survey the results showed that the level of stress and anxiety increased significantly. The study then went on to suggest that this may have detrimental effects on academic achievement.

66.2.2 Positive Psychology

The theoretical grounding for research on wellbeing is found in positive psychology. The theories leading up to its initial inception came from a need in psychology to shift the focus from pathology, weakness and damage, to a focus on more positive attributes such as strength and virtue (Seligman et al. 2005). From the research into this field, a number of constructs have been discovered with one being happiness.

66.2.3 Defining Happiness

Though it is difficult to define and assess, since the time of Aristotle people have attempted to assign happiness a clinical definition. Scoffham and Barnes say that "[it is] a state of flourishing that involves a sense of personal fulfilment within a shared moral framework" (2011, p. 537). O'Brian (2013, p. 228) though, sees happiness on a grander stage by stating that "happiness contributes to individual, community and/or global wellbeing without exploiting other people, the environment or future generations". In a review of the research on wellbeing, Ryan and Deci (2001) develop this further and cite two separate philosophies on happiness, which are hedonic and eudaimonic. The former, hedonic, defines well-being as "pleasure and happiness" (Kahneman 1999, p. 143), while the latter, eudaimonic, defines well-being as a construct which supersedes the notion of happiness to contain the realisation of "human potential" (Waterman 1993, p. 146).

66.2.4 *Measuring Happiness*

With the emergence and increased interest in positive psychology, a number of instruments are now available to measure subjective well-being (SWB) constructs. One such instrument is the Oxford Happiness Questionnaire (OHQ), developed by Hills and Argyle (2002). Seen by the authors as an improvement on the Oxford Happiness Inventory (OHI), the OHQ includes a new 6-part Likert scale and improved psychometrics that further allows the instrument to be used by a wider audience.

Some studies, though, have expressed concern over the reliability and validity of the OHQ as an instrument to measure SWB. Kashdan (2004) voiced concern over some of the items mentioned in the questionnaire as not being necessary to study SWB, therefore, possibly affecting the final results. Robbins et al. (2010) also echoed this by stating that “rest-of-test correlations ... revealed that four items correlated with the sum of the other items as a level below the threshold of .30”. They then go on to suggest that a shorter instrument be created which reduces the lengthy 29 points down to a more manageable number to increase reliability.

66.2.5 *Happiness Interventions*

With the burgeoning research on positive psychology and an increasing amount of interest in wellbeing, some researchers have looked at positive interventions, which pertain to the notion that happiness can be encouraged or even increased by implementing positivity-educing actions or activities.

A study by Lavis (2014) notes how a number of schools and institutions are implementing systems whereby the primary focus is on well-being with the aim of improving attainment. Zabihi and Ketabi (2013) argue that English as a second language (ESL) classes are the perfect ground for happiness interventions given that ESL students come from various backgrounds and are able to express their views on various issues that they may not be able to talk about in their first language. They suggest that pedagogy of happiness could be integrated, as language classrooms frequently implement learning outcomes that are not necessarily linked to knowledge transfer. Although, they do admit that the realisation of this may be a little more complex. O’Brien (2010) takes the idea of a pedagogy of happiness and suggests “sustainable happiness” (O’Brien 2005), which is the idea that happiness can be brought to an individual of community by one’s very own actions. The theory is that sustainable happiness can be used to drive positive outcomes that have an effect on a local or global level as long as they do not come at the expense of another’s happiness.

Whereas Seligman (2005) and Sheldon and Lyubomirsky (2006) reported that a sustained happiness could be achieved through intervention, Henricksen and Stephens (2012) findings are to the contrary. When they investigated activities that may promote happiness in adults, the findings suggested that the happiness level

was not equal to a study that was previously carried out by Tkach and Lyubomirsky (2006), who found that intervention activities increased happiness among a younger sample. This finding is also substantiated by Van Zyl and Rothermann (2012) whose investigation the use of Positive Psychological Interventions (PPIs) on third year degree students and claimed that PPIs, in the case of this study, workshops and discussions, were found to increase the participants' engagement, interest, autonomy, competence, and overall happiness. In order to further build on this model, they suggest that "PPIs should focus more strongly on aspects relating to authenticity" (p. 378) such as group activities or team-based coaching. Scoffham and Barnes (2011, p. 378) also touch on the idea of authenticity as they mention the work of positive psychologist, Csikszentmihalyi (1997), who provides us with a "theory of flow" which refers to a time when we are engaged in an activity where time seems to flow by without us noticing. This notion of flow, they say, can be encouraged by teachers who create learning environments that present an authentic challenge to learners.

From the research available on happiness, much of it has taken a quantitative approach, whereby an overall happiness or well-being statistic was created for a large sample (Andrews and Chong 2011; Bradshaw et al. 2006; Gutman and Vorhaus 2012; Henricksen and Stephens 2012; Tkach and Lyubomirsky 2006). Therefore, there is a need for more studies that take a qualitative approach to happiness such as studies conducted by Dex and Hollingworth (2012), and Downing and Lamont (2007). Moreover, much of the research to date seeks to establish a general overview of happiness pertaining to current levels of wellbeing captured at the time of data collection. There is, then, a need for research into possible interventions that can increase happiness among learners.

66.3 Methodology

The study is driven by an interpretivist approach to research which contemplates the existence of multiple realities and ways of knowing, thereby embracing interpretivist ontologies. A case study approach was incorporated for this study. Eisenhardt (1989) states that this type of study is suitable for new types of research where the available knowledge is limited. Rowley (2002) goes on to affirm that a case study is the study of an event in its natural setting, thus replicating it in a laboratory is not necessary. Both quantitative and qualitative data were collected and analysed for this study using SPSS as well as qualitative analysis of interview transcripts. To implement the positive psychological intervention, a project-based learning (PBL) approach was taken. Jonassen's (1999) theories on constructivist learning environments were adapted and subsequently modified into a framework suitable for this project.

The framework holds true to many of the values suggested by Jonassen such as learning that is project-based; owned by the learner; consists of experiences that create knowledge; is active and authentic (p. 216). Figure 66.1 contains six sections that facilitate the project and learning process, they are: research – pre-task activities that introduce the learner to a topic; Experience – learners engage with the

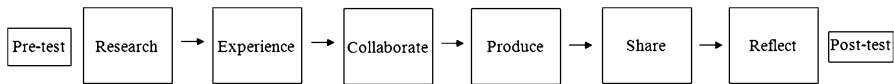


Fig. 66.1 The Social outreach project-based learning framework

community; collaborate – learners work with fellow students; Produce – learners create a product; Share – learners share their creation with the other groups; Reflection – learners reflect on their individual experiences. Data from this process is then subsequently collected at the outset and completion for analysis.

66.3.1 *Methods of Data Analysis: Quantitative and Qualitative*

Quantitative Analysis: Due to the low sample size a Wilcoxon Signed Ranks Test was used to analyse the data. The sample size was 16; however, eight participants were randomly selected for further analysis. The Wilcoxon test, then, allowed the researchers to run statistical analysis with a lower number of participants, which would provide more reliable results as compared with a t-test that requires a minimum sample of 30. **Qualitative Analysis:** Interviews were carried out with four teachers. They were asked to reflect on the selected participants and comment on their behaviour before, during and after the project. The semi structured interviews were transcribed in full where they were then coded. From these codes themes emerged which allowed the researchers to understand the students from a different perspective.

In addition to the analysis of the interviews, the researchers took the questionnaire and did a qualitative analysis of it. A thematic analysis was carried out using themes suggested by Kashdan (2004) which are Social Interest, Kindness, Humour, Sense of Purpose, Awe/Aesthetic Appreciation, and Self-Esteem/Acceptance. Six students were selected to represent the lowest, mid-range and the highest mean scores from the questionnaire pre- and post-test. The researchers then categorised each question into a theme and then systematically analysed the questionnaires by tabulating each question into its respective theme. Once the questionnaire questions had been tabulated into themes, the researchers totalled each theme and generated a mean. The same themes were then used to analyse and code reflective essays written by the students. The data from the thematic analysis of the questionnaire and the reflective essays were then compared and contrasted.

66.3.2 *Validity*

The quantitative data provided the researchers with an overview of the participants' happiness levels before and after the project. However, in order to validate the findings further the researchers carried out interviews, as well as a qualitative analysis

of the questionnaire and student reflections. By triangulating this data the researchers were able to create a more detailed picture of the levels of happiness of each student, and the questionnaire could be substantiated with data from interviews and the student reflections.

The analysis was carried out with an interpretist view of the data leaving the researchers to make “inferences to unobservable phenomena” (Maxwell 2013). In order to increase validity of the data, the researchers cross examined each other’s work by critically assessing it. Finally, as previously mentioned, the multiple data points provided the researchers with additional data in order to either substantiate or refute results.

66.3.3 Ethics

All participants, students and teachers, were first made aware of the study before taking part. The students and teachers were briefed that their personal information would remain private and confidential. They were also informed that at any point they would be able to withdraw from the study.

66.3.4 Instrument

The Oxford Happiness Questionnaire (OHQ) was used to ascertain the happiness level of the students (Hill and Argyle 2002). The questionnaire consists of 29 questions with each being rated with a 6-part Likert scale. Twenty-eight students completed the questionnaire in week 1 and week 6 of the course. Sixteen questionnaires were distributed with a 100 % response rate for pre and post questionnaires. The instrument asks a number of questions (e.g., I feel life is rewarding, I find most things amusing, I am very happy, I feel mentally alert, I don’t feel particularly healthy), and these questions, the authors ascertain, can aid in quantifying a person’s happiness level. At the end of the survey, the scores were calculated and then divided by the total number of questions (29) to obtain a score out of 6. The higher the score out of six, the higher the happiness level of the participant is.

66.3.5 Sample

Sixteen students took part in the project and completed the questionnaire. Their ages ranged from 18 to 24, and they came from various countries around Asia such as Malaysia, Indonesia, Japan, Korea, Kazakhstan, and the Middle East. From the sample of questionnaires, eight were randomly chosen from separate piles consisting of local Malaysian students, as well as male and female.

Aside from students, four teachers were also interviewed. The teachers are all Malaysian and taught the students in this study. Each teacher saw their students for 2-h, Monday to Friday. The teachers taught the students language skills such as listening & speaking, and grammar & writing.

66.3.6 Interview

On completion of the project four teachers from the course participated in a semi-structured interview designed to discover more details about eight students who were randomly chosen. The interviewees were asked to comment on the selected students' behaviour before, during, and after the project. They were then asked if there had been any change in each student's behaviour over the course of the project. The interviews were subsequently transcribed and tabulated for analysis.

66.3.7 Location

The project was carried out at a private university in Malaysia. The students who attended the English course did so in order to improve their English level before entering into the main university courses to study business, hospitality, and design.

66.3.8 Duration

The students were part of an intensive English course with a duration of 6 weeks. The course commenced on June 2nd and was completed on July 11th. The project itself started on in Week 3 (June 16th) and finished on July 4th, with questionnaire being distributed in Week 1 and Week 5 respectively.

66.3.9 Project Outline

In 2013 a project was devised which would encourage students to engage with a local community. The aim of the project was to meet, learn from and interview people from a specific group. Now, in 2014 the same project was carried out again with new students and a new community. The outcome of each project was to publish a book of stories from that community. The students were part of this process and participated as researchers with the task of interviewing and collecting stories from various individuals in that community.

The community chosen for the 2014 project consisted of people with special needs. For the students, many of whom had little to no knowledge or contact with this group previously, it was an opportunity to meet and learn about people whose lives are quite different from their own. The centre is a foundation that employs people with special needs in administrative roles, as well as providing training and employment. People with special needs come from various parts of Malaysia to this centre as jobs and opportunities are limited for people with disabilities. The project outline is as follows and is centred around the framework in Fig. 66.1.

Step 1: The students were first briefed about the project and told that as researchers they would be credited in the final release of the book. They were also asked to become teachers, where they would be expected to teach something at the special needs centre. From this point, the students were put into groups of three to four people.

Step 2: The students were taken by bus to the special needs centre. At first they were given an explanation of the centre and the work they do. Then representatives of the centre explained to them how to assist people with disabilities. Shortly after that the students went into their groups and met one person from the centre who they would teach and then interview.

Step 3: When they are back in the classroom, the students were asked to transcribe the interview and upload their photos and videos to a wiki page (the links from each page were passed on to writers and illustrators in the latter stages of the project).

Step 4: The final part of the project was for each group to create a reflective documentary about their experience, which included interviews with group members and footage from their time at the centre. The students were then tasked with organising a film festival in which to screen their documentaries to the other groups and members of staff.

66.4 Data Analysis

The following section will present data for the pre- and post-tests carried out during the study with the mean scores stated below. The next section will then discuss the data taken from interviews with the teachers on the project (Tables 66.1, 66.2, 66.3, 66.4, and 66.5).

The pre-test mean was 4.05 while the post-test mean was 4.07. This indicates that there is a slight increase although insignificant difference in the level of happiness among the students. The minimum for the pre-test was 3.10 while the maximum level of happiness recorded was 5.28 out of a 6 point scale. On the other hand, the minimum level of happiness recorded post-test was 2.66 while the maximum level recorded was 5.93 out of six. Six students had a higher score in the pre-test and eight students had a higher score in the post test. There were two that had no changes between the pre-test and post- test, $P=0.753$. The data shows that though there was

Table 66.1 Pre-test results

Participant	Mean scores
P1	4.344828
P2	4.241379
P3	4.586207
P4	4.655172
P5	3.965517
P6	4.172414
P7	5.275862
P8	4.137931
LF1	3.655172
LM1	3.172414
LM2	4.344828
LM3	3.103448
IM1	3.586207
IM2	5.034483
IM3	3.137931

Table 66.2 Post-test results

Participant	Mean scores
P1	3.62069
P2	4.241379
P3	3.758621
P4	5
P5	3.689655
P6	4.724138
P7	5.931034
P8	4.758621
LF1	3.310345
LM1	3.37931
LM2	4.482759
LM3	2.655172
IM1	3.724138
IM2	4.758621
IM3	3.62069

Table 66.3 Non-parametric test results

	N	Mean	Std. deviation	Minimum	Maximum
Pre	16	4.0474	.66993	3.10	5.28
Post	16	4.0776	.81480	2.66	5.93

Table 66.4 Wilcoxon signed ranks test results

		N	Mean rank	Sum of ranks
Post – Pre	Negative ranks	6(a)	7.92	47.50
	Positive ranks	8(b)	7.19	57.50
	Ties	2(c)		
	Total	16		

Table 66.5 Test statistics

	Post – Pre
Z	-.314(a)
Asymp. Sig. (2-tailed)	.753

a slight increase in reported happiness from pre- to post-test, the increase was insignificant. Therefore, no solid conclusions can be deduced to link the happiness level of students with the administration of the social outreach project.

To further corroborate the data from the questionnaires, interviews were conducted with the teachers who ran and oversaw the project. The data will be presented in a narrative form in the following section.

66.4.1 Teachers' Observations

The teachers were interviewed to get a clearer picture of students' changes in behavioural patterns. LF1 was observed as quiet, hardworking, and overall a good student by her teachers. However she didn't mingle too much with the classmates except to complete assignments. The student had also been observed as a student who was keen on asking for additional language practices. After the project, she showed more interest in participating with her classmates confidently and initiated conversations with new people. LM1 was very talkative and tactless before the project. The student showed a significant change in interaction with people. The student was noted to be sensitive and more cautious before he articulated his ideas. LM2 on the other hand, was the motivator of the group. He was observed as the dynamic leader of his group. After the project, he showed increased leadership and managed to steer his group members to submit the assignment before the deadline. They were the first team to submit the assignment. He was more confident to speak in English as compared to prior to the project. LM3 was as talkative as LM1, but he was slightly weaker in English proficiency than LM1. The student was not shy and had shown tremendous level of effort in his interactions with his peers. After the project, LM3 had told one of the teachers about how grateful he felt with his life. He also had noted that he had learned to be "happier and positive." IF1 was observed by the teacher and she was known to be quiet, smart and obedient, common attributes of a follower. After the project, the student transformed, at her own volition to lead her team and became more communicative. She noted that she wanted to do the same

project “when (she) went back to her own country.” According to the interviews with the teachers, IM1 was quiet at the outset of the project and showed little interest. A teacher noted that “(he) didn’t do much before the project.” This behaviour continued during the project where the teacher was told that IM1 did not contribute in the process of completing the assignment. Even so, the teacher asserted that he tried his best but, “he’s not a responsive person.” IM2 was observed as very reserved and timid. The teachers attested to this based on his lack of participation in the classroom. However, he was noted as being a technology-savvy and smart student. After the project he communicated more with his classmates and showed more confidence. The student was elected as the chairperson of the film festival, which showcased the videos made by the students to document their experiences throughout the duration of the project. IM3 had shown an array of behavioural patterns. He was observed to be very quiet, smart, and lazy. Those attributes are at a separate oppositional gamut. A teacher noted that, there’s a high chance that “the traditional classroom set-up didn’t really pique his interest in learning” because he showed a marked difference in attitude during the visit. IM3 sang a song for an audience and showed a substantial involvement in the project. After the project, he became more collaborative and helpful.

66.4.2 *Thematic and Reflective Data*

The students’ reflective essays were analysed and their writings were plotted into themes proposed by Kashdan (2004). Six students were selected to represent the lowest, mid-range and the highest mean scores in the pre-test. For the lowest, students IM3 and LM3 covered the themes of Social Interest, Kindness, Humour, Sense of Purpose, Awe/Aesthetic Appreciation, and Self-Esteem/Acceptance. IM3 showed lack of social interest and kindness and went on to express that he “thought that considering special needs people is not his business” and that they “are from two different worlds.” He thought the project would be boring, but changed his mind after and claimed that it “has changed his perception” of special needs people. He also exemplified a moderately low self-esteem because he “felt panicked” to teach Korean, but managed to overcome it eventually. LM3 on the other hand had shown a gamut of emotions with appreciation and acceptance being the most prominent. The student was elated with the experience and wanted “everyone to experience this at least once in their lives because it will really change your opinion and you will find something special along the beautiful journey.”

For the two students in the mid-range mean scores, they covered most themes except for Awe/Aesthetic Appreciation, Autonomy/Locus of Control, and Physical Health. Both students P8 and P6 expressed their interest and felt that the project was “meaningful” and that it “was not a bad task.” P6 noted that “although she could not understand the person’s story very well, she could feel what the person was feeling.”

Self-esteem was an issue for her as she was very reticent in class and “without this project, I think I won’t talk to my classmates.” The student P8 managed to understand beyond words and found a sense of purpose in her life. The project has “inspired her a lot.”

Students in the highest tier of mean scores focused more on Kindness and Self-Esteem/Acceptance in their reflections of the project. IM2 was decidedly honest about what he felt about the special needs community and he believed that “they have their values for the world although the values are not usually big.” The project seemed to be meaningful to him because it was his first time having any contact with the said community. P7 felt that “group work made us become closer with classmates” and that the project “was a meaningful experience” for her. She now knows “more about people with disabilities and learnt that they are positive and optimistic.” The student’s reflection was very positive and she thought the project was “unforgettable.”

Running across all six reflections, being meaningful is a recurring idea in their writings. Even students with the lowest mean scores seem to be able to reflect on how positive the project was. Most students have never had any experience working with the special needs community. Some also mentioned about not getting the opportunity to take part in community service in their respective home country. Overall, based on the reflections, there was an increase in happiness among students who participated in the project irrespective of their mean scores.

66.5 Discussion

The quantitative data captured in the questionnaire illustrated an insignificant increase in happiness due to the social outreach intervention, which refutes findings by Van Zyl and Rothermann (2012), Seligman (2005), and Sheldon and Lyubomirsky (2006) who found data to the contrary. Instead the findings in this study correlate more closely with a study conducted by Henricksen and Stephens (2012) who found that happiness interventions among older adults did not contribute significantly to their overall happiness. They also go on to mention that whereas some studies have reported increases in happiness due to interventions, the measurement techniques used may not be sufficient.

The studies mentioned previously were conducted with large numbers of participants, and only looked at happiness from a positivist viewpoint, opting to use a questionnaire in order to discover any self-reported incidents of increased happiness. While the data provides valuable insight, it subjugates happiness to a number. Studies by Dex and Hollingworth (2012), however, looked into qualitative research concerning young people’s understanding of well-being by listening to their voice. Studies like this show happiness in its true form: complex and personal. This study, while small, also built on studies such as the aforementioned by investigating

happiness in more detail and from a personal perspective in the form of interviews and reflective essays.

Initially the quantitative data revealed little in terms of increased happiness through a social outreach intervention; however, when the researchers turned their attention to interviews they discovered that over time the behaviour of some students changed somewhat. Nevertheless, we cannot make claims that this was due to increased happiness. Furthermore, when the researchers analysed the questionnaires and reflective essays in more detail they discovered that the participants spoke about the project in a positive manner. One aspect that emerged from the qualitative data is the meaningful impact that the project had on the participants. Again, we can not make any claims to this increasing their happiness levels, or even if it relates to happiness in any significant way.

It is then back to the study by Dex and Hollingworth (2012) who analysed a number of studies on children's voices, where they say, "There is a need for clearer understanding on how age differences between children aged 8 and 16 have a varying impact on what they mean by wellbeing and its components" (p. 26). The researchers suggest that understanding what well-being means to younger people may assist researchers in creating instruments that more accurately gauge happiness from their point of view. To a certain extent this study supports this finding in the sense that the participants were also young, though not as young as in the aforementioned study. The participants may have been unfamiliar with happiness as a construct that can be measured, or the questions used may not have suited their own interpretation of what constitutes happiness. Finally, happiness may mean different things to different people in terms of age and in terms of place of origin. The majority of the studies were carried out in Westernised countries (U.K., U.S., and Australia), so there may be some divergence on western notions of happiness when it is from an Asian perspective.

66.6 Conclusion

At the beginning of the study, the researchers identified two research questions that they wished to investigate: (1) Does a social outreach project increase happiness levels among students?; (2) Are there any marked differences in the state of happiness before and after the social outreach project? As for research question 1, the quantitative data reveals that there is no significant increase in happiness levels from the administered questionnaire in the pre- and post-test, so the research question. Question 2 proves more complex to answer. Whereas teachers reported a noted

difference in behaviour and the students themselves reported positive outcomes from the project, there is no conclusive way to ascertain if these relate in any way to an increase in their happiness levels.

Though large scale positivist, number driven studies can provide a general overview of happiness, they fail to take into account the complex and personal side of human happiness. This study found a large divergence between quantitative and qualitative data, which shows on the one side happiness is constant with little fluctuation, however, when seen from the perspective of others and from the self, there is a behaviour change. More research, though, is needed to discover if this change is driven by happiness of another construct such as motivation.

66.7 Future Research

The effect of a social outreach project may have had an impact on learners' motivation in terms of happiness. When the learners are motivated to complete a task, their attitudes and affective states influence the degree of effort that the learners are going to practise English language (Ellis 2006). In this social outreach project context, English language is adopted because the learners are interested in the community and culture. Integrative motivation allows the learners to manipulate and overcome the people of English language (Lambert and Gardner 1972). Apart from integrative motivation, intrinsic motivation encourages the learners to seek happiness from the project. Participating in the social outreach project could inspire them to be more collaborative, helpful and happier, because positive attributes are gained from the assigned task (Ellis 2006). Hence, the student participation is understood that integrative motivation lies heavily within the members of the society. There is then the opportunity for researchers to combine research on motivation, which is long standing, and advance it with research into happiness and how they both relate to each other.

Other research may need to take a post-positivist view towards researching happiness as it is a complex construct which is inherent to each person. By following the word by Dex and Hollingworth (2012), researchers could investigate what happiness means to each participant first, and then proceed to follow that participant and note changes in happiness based on the participant's own interpretation of it. Maybe then, the data will be able to more precisely illustrate what represents happiness and what interventions can be put in place to increase it, or simply maintain it.

Interpretation of Score (Wright 2008)

1–2

Not happy. If you answered honestly and got a very low score, you're probably seeing yourself and your situation as worse than it really is. I recommend taking the Depression Symptoms test (CES-D Questionnaire) at the University of Pennsylvania's "Authentic Happiness" Testing Center. You'll have to register, but this is beneficial because there are a lot of good tests there and you can re-take them later and compare your scores.

2–3

Somewhat unhappy. Try some of the exercises on this site like the Gratitude Journal and Gratitude Lists, or the Gratitude Visit; or take a look at the "Authentic Happiness" site mentioned immediately above.

3–4

Not particularly happy or unhappy. A score of 3.5 would be an exact numerical average of happy and unhappy responses. Some of the exercises mentioned just above have been tested in scientific studies and have been shown to make people lastingly happier.

4

Somewhat happy or moderately happy. Satisfied. This is what the average person scores.

4–5

Rather happy; pretty happy. Check other score ranges for some of my suggestions.

5–6

Very happy. Being happy has more benefits than just feeling good. It's correlated with benefits like health, better marriages, and attaining your goals. Check back – I'll be writing a post about this topic soon.

6

Too happy. Yes, you read that right. Recent research seems to show that there's an optimal level of happiness for things like doing well at work or school, or for being healthy, and that being "too happy" may be associated with lower levels of such things.

References

- Alex Linley, P., Joseph, S., Harrington, S., & Wood, A. M. (2006). Positive psychology: Past, present, and (possible) future. *The Journal of Positive Psychology, 1*(1), 3–16.
- Andrews, A., & Chong, J. L. Y. (2011). Exploring the wellbeing of students studying at an Australian University of New South Wales. *Journal of the Australia and New Zealand Student Services Association, 37*, 9–38.

- Csikszentmihalyi, M. (1997). *Creativity: Flow and the psychology of discovery and invention*. New York: Harper Collins.
- Dex, S., & Hollingworth, K. (2012). *Children's and young people's voices on their wellbeing* (pp. 1–49). London: Loughborough University, Working Paper, 16.
- Downing, D., & Lamont, E. (2007). *HEARTS: Higher education, the arts and schools*. London: National Foundation for Educational Research (NFER).
- Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, *14*(4), 532–550.
- Ellis, R. (2006). *Second language acquisition* (Oxford introductions to language study). Hong Kong: Oxford University Press.
- Goswami, U. (2004). Neuroscience and education. *British Journal of Educational Psychology* *74*(1), 1–14.
- Gutman, L. M., & Vorhaus, J. (2012). *The impact of pupil behaviour and wellbeing on educational outcomes* (pp. 3–42). London: GBR.
- Henricksen, A., & Stephens, C. (2012). The Happiness-Enhancing Activities and Positive Practices Inventory (HAPPI): Development and validation. *Journal of Happiness Studies*, *14*(1), 81–98. doi:10.1007/s10902-011-9317-z.
- Hills, P., & Argyle, M. (2002). The Oxford happiness questionnaire: A compact scale for the measurement of psychological well-being. *Personality and Individual Differences*, *33*, 1073–1082.
- Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 215–239). New York and London: Routledge.
- Kadison, R. (2005). Getting an edge – Use of stimulants and antidepressants in college. *The New England Journal of Medicine*, *353*(11), 1089–1091. doi:10.1056/NEJMp058047.
- Kahneman, D. (1999). Objective happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *The foundations of hedonic psychology* (pp. 3–25). New York: Russell Sage.
- Kashdan, T. B. (2004). The assessment of subjective well-being (issues raised by the Oxford Happiness Questionnaire). *Personality and Individual Differences*, *36*(5), 1225–1232. doi:10.1016/S0191-8869(03)00213-7.
- Lambert, W., & Gardner, R. (1972). *Attitudes and motivation in second-language learning*. Rowley: Newbury House.
- Lavis, P. (2014). Resilience and results: How promoting children's emotional and mental wellbeing helps improve attainment. *Education and Health*, *32*(1), 30–35.
- Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd ed.). Thousand Oaks: Sage.
- Callender, C., Ramsden P., & Griggs, J. (2014, July). Review of the national student survey. Higher Education Funding Council for England (HEFCE).
- O'Brien, C. (2005). Planning for sustainable happiness: Harmonizing our internal and external landscapes. In *2nd international conference on gross national happiness*, Nova Scotia, Canada.
- O'Brien, C. (2010). Sustainability, happiness and education Catherine O'Brien, PhD Education Department, Cape Breton University. *Journal of Sustainability Education*, *1*(May). Retrieved from <http://journalofsustainabilityeducation.org/ojs/index.php/>
- O'Brien, C. (2013). Happiness and sustainability together at last! Sustainable happiness. *Canadian Journal of Education*, *36*(4), 228–256.
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Boston: Heinle & Heinle.
- Robbins, M., Francis, L. J., & Edwards, B. (2010). Happiness as stable extraversion: Internal consistency reliability and construct validity of the Oxford happiness questionnaire among undergraduate students. *Current Psychology*, *29*(2), 89–94. doi:10.1007/s12144-010-9076-8.
- Rowley, J. (2002). Using case studies in research. *Management Research News*, *25*(1), 16–27.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166.

- Scoffham, S., & Barnes, J. (2011). Happiness matters: Towards a pedagogy of happiness and well-being. *The Curriculum Journal*, 22(4), 535–548.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: Empirical validation of interventions. *The American Psychologist*, 60(5), 410–421. doi:10.1037/0003-066X.60.5.410.
- Sheldon, K., & Lyubomirsky, S. (2006). How to increase and sustain positive emotion: The effects of expressing gratitude and visualizing best possible selves. *Journal of Positive Psychology*, 1(2), 73–82.
- Soilemetzidis, I., Bennett, P., Buckley, A., Hillman, N., & Stoakes, G. (2014). *The HEPI – HEA Student Academic Experience Survey 2014*, 1–40.
- Tkach, C., & Lyubomirsky, S. (2006). How do people pursue happiness?: Relating personality, happiness-increasing strategies, and well-being. *Journal of Happiness Studies*, 7(2), 183–225. doi:10.1007/s10902-005-4754-1.
- Van Zyl, L. E., & Rothermann, S. (2012). Beyond smiling: The evaluation of a positive psychological intervention. *Journal of Psychology in Africa*, 22(3), 369–384.
- Waterman, A. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaimonia) and hedonic enjoyment. *Journal of Personal and Social Psychology*, 64, 678–691.
- Wright, S. (2008). Meaning and happiness. *Oxford happiness questionnaire*. Retrieved on September 20, 2014, from <http://www.meaningandhappiness.com/oxford-happiness-questionnaire/214/>
- Zabihi, R., & Ketabi, S. (2013). Advocating a pedagogy of happiness in TESOL: Antecedents and potentialities. *The Journal of Happiness & Well-Being*, 1(2), 39–50.

Chapter 67

Nonverbal Communication Among Arab Debaters in Malaysia

Majdan bin Paharal Radzi and Zurina Khairuddin

Abstract Arabic Language learners, specifically the debaters, should be competent in their performance of the language. There are several ways to master Arabic and one of them is through debate. This study attempted to identify the competency of Arabic debaters in their performance through Arabic Language Debate. This study used the qualitative research design in which nonverbal communication was analyzed. Six debaters were studied. The debates were analyzed after they were recorded. In addition, the researcher took notes while observing their hand motions, their visual contact, and use of emotions. The results of the study showed that nonverbal communication and effective debate correlated. Precisely, good use of hand motions, visual contact, and emotions enabled debaters to be more effective in conveying the message and influence listeners (viewers) to interact with them. Using hand gestures, keeping eye contact, and using the right emotion were in line with the context made by the debaters and it showed that the debaters expressed what they want to convey to the audience more effectively.

Keywords Nonverbal communication • Effective debate • Malaysian Arabic learners

67.1 Introduction

Mastering the proficiency of Arabic is one of the key problems for non-native speakers. Therefore, this is an important issue that needs continuous study and development. This is due to the obsession of mastering the proficiency of Arabic language, which is growing more and more in the minds of learners. If the goal of debate was identical to the requirements, the exerted efforts to fix fault and to improve their standard are continuing, therefore it will lead the learners to retain the Islamic

M.b.P. Radzi (✉) • Z. Khairuddin
Faculty of Languages and Communication, Universiti Sultan Zainal Abidin (UniSZA),
21300 Kuala Terengganu, Malaysia
e-mail: majdan@unisza.edu.my; zkzurina@unisza.edu.my

identity and the ancient Arabic culture. Hence, the foundations of the present research are very clear as it is linked to the level of understanding of science and culture. Arabic is the medium used by the researcher as an important tool to reach the desired goal. Therefore, the focus in this process should be to define the language skills, which will enable the researcher to understand the data clearly and precisely.

The study aimed to investigate the role of the vocal and oratorical skills through debate. In fact, participating in debating activities provides the students with a vital opportunity to enhance these skills. Moreover, the researcher used qualitative approach to look at two sides: first is the ability of the debaters to pronounce the Arabic sounds and second is the ability of the debaters in the arts of diction.

67.2 Nonverbal Communication

Communication is a very important component when it comes to dealing with people. Communication consists of two dimensions: verbal and nonverbal. Individuals need to have communicative abilities which demand them to go beyond the linguistic context and pay attention to the nonverbal cues of their speaking-partners. De Vito and Hecht (1990, p. 4) describe nonverbal communication as “all of the messages other than words that people exchange” and the use of these symbolic messages are intentional. In addition to that, spoken messages need to be complemented by nonverbal messages. Some researchers even asserted that nonverbal language is used more repeatedly than verbal communication (Goldin-Meadow 2004; Kelly and Goldsmith 2004; Schober 1999; Warfield 2001). Some of the examples of nonverbal communication are body language, facial expressions, prosodic vocal features, time, touch, space, physical appearance, and environment and these features are used to communicate meaning (De Vito and Hecht 1990). Many scholars discuss the effectiveness of using nonverbal communication to enhance the language competence. Turk (1985) mentioned that all the hints, indications, and suggestions we communicate are about how we act. When we communicate, we are not only giving the verbal presentation, but also with a whole range of gestures, movements and expressions.

The body language is considered as a significant method of the effective contacts and communications among people. The use of this method is indispensable in every contact. Accordingly, Yousef (2007) mentioned that if the speaker seeks to deliver an influential speech, then it is upon his behaviour to use the physical gestures, where the body language would help the audience to catch the gist of the speech easily and clearly. For instance, the phrase go straight down the pedestrian walk can be complemented with hand gestures.

Most of the language speakers use different gestures in delivering the speeches; some use the beckons of eyes, eyebrows, mouth, facial expressions, arms and hands beckons too. In addition, there are several types of smiles to use (Mursi and Khaled 2008). These gestures are very useful in the speech or the talk, which affect the hearts of listeners as it indicates that the speaker strives hard to deliver the targeted

message. Therefore, the best speaker who can use the proper gestures which are consistent with his words and audience emotions can create harmony of the speech Yousef (2007). According to Ramzi al-Husamiy (2004: 86) who studied gestures, “there is personal gestures for every human, which should be close to him as same as his toothbrush, however, people are different and naturally the gestures will be different too, whenever they act it.”

Diction or the arts of speech requires the body language and one of the most useful gestures is hand gesture. Mursi and Khaled (2008) agreed that the usage of hand gestures when delivering a speech could strengthen the significance of the meanings and affirm it. Other than that, it can also carry specific connotations to the audience. In contrast, they disagree with some other gestures of the hand, such as crisscrossing fingers when delivering the speech (Mursi and Khaled 2008).

67.3 Debate

Debate is the process of inquiry and advocacy. It is also a way of arriving at a reasoned judgment on a proposition (Austin and Steinberg 1999). Farisi and Salah (2009) referred to *Lisan Al Arab* to understand the meaning of “debate”. They said “linguistically, one debated another means he became his/her opponent. One debated another means competed with him/her based on logic. Something is debated with another means being compared to another. When people debate over something, they do argue”. Debate is actually derived from “looking at things by the mind, which means looking at things logically”.

Sadiq and Hasan (2002) believed that the linguistic concept of debate in *Taj Al Arous Dictionary* by Zubaidi is very similar to what others indicated. To him, debate is questioning something and providing evidences the debater can see by his/her mind. Although this definition gives the word “debate” a psychological dimension by using the word “mind”, it still does not reach the level, where the comprehensive linguistic concept of the word “debate” is reached.

Debate “*munazarah*” is rooted as *mufa’ala*. The root of the word is *nazara*, which refers to looking into something, that is participation and it means having more than one person to participate in such a debate. There are two connotations of the word “*nazara*”, which means looking into something. The physical meaning refers to the black clear dot in the eye by which one can see things, while the abstract meaning means contemplating something. This is what was mentioned by Al Hasnawi when he differentiated between the abstract and physical meanings of the word (Farisi and Salah 2009).

Debate has gotten the attention of the government of Malaysia. For example, at university level, debate awards were given out by the Prime Minister of Malaysia. This debate competition was first held by The International Islamic University of Malaysia. The name of such a competition was Debate in Arabic among Universities in Malaysia. In this debate competition, almost all Malaysian universities participate. In addition, many debate competitions have taken place in Malaysia. These compe-

Table 67.1 List of debaters marks

Total	Content	Performance	Fluency
100	20	40	40

titions include Royal Debate, Debate among Universities, Debate in Arabic at ASEAN universities level, Arabic debate among Colleges, and Arabic debate competitions among Students' Hostels (Farisi and Salah 2009).

The following Table 67.1 illustrates the marks:

1. Content was evaluated from different aspects including suitability, improvement and creativity, explaining reasons and facts, giving examples and providing convincing answers to questions from the opponents.
2. Performance was evaluated based on the suitability of the debater's speech and its effectiveness during the speech and providing the audience with evidence and references.
3. Fluency was evaluated based on grammar and correct pronunciation.

In this context, the researcher believes that correct pronunciation and proper presentation of ideas during a debate are very crucial because these two factors can enable the debater to do well. Besides, there are different characteristics that debaters should have to be effective. For example, Wood and Goodnight (1987) stated the important characteristics that debaters should have. These are as follows:

1. Debaters should deliver their speech as if they are talking to each individual. They should convey the impression that they are persons.
2. Debaters should develop in their speeches an extemporaneous quality that communicates a corresponding reaction to critics.
3. Debaters should use bodily actions to facilitate persuasive communication. Any gestures, facial expression and body movements used should help emphasize the arguments and help keep the interest of the judge.

One of the important characteristics of a debater is to be able to communicate effectively through nonverbal communication, particularly body language (Snider 2008). This is a result of, according to Yeşil (2008), debaters are very responsive to each other's nonverbal behaviours. In other words, debaters are often affected by their fellow debaters' nonverbal behaviours in a negative way. Therefore, it is important that a debater is able to intimidate their opponent through body language.

67.4 Research Design

This section sheds light on the qualitative method used in this research, along with the research tools, procedures of data collection, and data analysis.

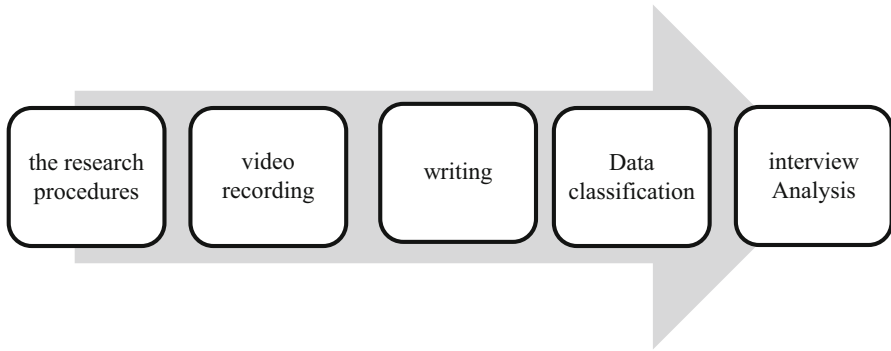


Fig. 67.1 Research procedures

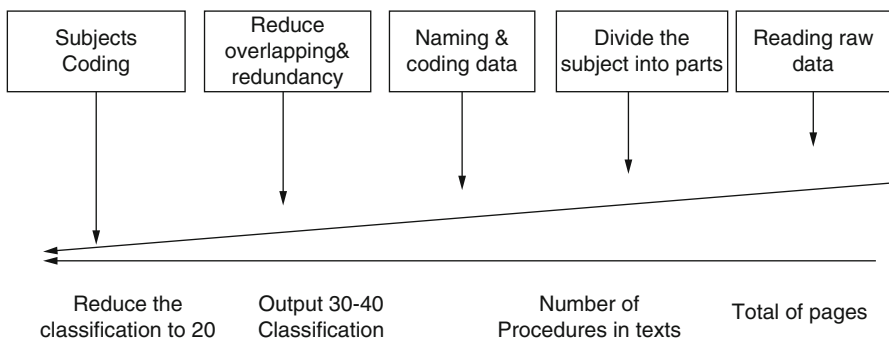
This study focused on the qualitative approach to collect and analyze the data. Marican (2009) agreed that the qualitative approach relies on analyzing the data and numbers such as the study of behaviour, personalities, taking decisions, and the study of parents feeling who beat their kids, to conclude with that this approach focus on real events, and study the event itself.

Strauss and Corbin (1990) pointed out that the qualitative research is a type of research that produces results which cannot be reached through statistical procedures or others of quantitative measurement procedures. The theme of this research highlights the human behaviour and performance, the social communication, and interactions. Therefore, the researcher used a qualitative approach due to its relevance to conduct the study.

The following chart illustrates the research procedures (Fig. 67.1):

To illustrate the subject and classify the data, see the graph below:

The steps of data classification and coding



67.4.1 Discussion

The researcher analyzed and discussed the data with regards to the qualitative approach.

67.4.1.1 Speech Analysis

This section focuses on the analysis of body language, actions, standing, voice, and tones with discussing its facets and answering this question:

1. What are the student's possibilities in doing the physical movements?

67.4.1.2 Analysis of Movements in General

After analyzing the data, the researcher found that the students' possibilities in doing the physical movements are listed in the following main movements:

1. **Hand motions (Movement):** the hand moves is considered a positive impact in general. The phenomenon of hand movements is to move both hands and use them in a certain way to show respect while the move of clasping fingers indicates negative impact of the speaker.
2. **Visual contact:** To the audience, the visual transition is an important aspect of a good speaker. However, looking at the paper and reading it and not looking at the people is a negative aspect, which indicates a lack of readiness or preparation or lack of self-confidence.
3. **Emotions:** interaction with the speech is a very impressive thing. For example, the speaker, who uses negative tools like no and not in a serious manner and therefore, interaction is a negative thing when it comes to debating.

This section studies and analyzes the previous movements.

67.5 Hand Motions

This section covers a part of data analysis under the art of speech which the study looked at with regards to hand motions (Table 67.2). The finding of this study revealed that there are some positive and negative aspects in using hand motion. However, hands usage during the speech should be adequate to the spoken text and strengthen its meaning, and to transmit certain sense to the audience. Furthermore, the researcher noticed that most of the good speakers or orators used positive motions of the hands to attract the audience heads. The following are some of the positive and negative aspects of hand's motion observed by the researcher to two speakers.

Table 67.2 The analysis of hands motion

	Observation	Analysis
Clasping fingers P5	Move both hand P1	Hands motions
	Move both hands to indicate something P3	
	Move both hand for welcoming P3	

The first speaker used P1 to pronounce the following statement: “Thanks to His Excellency, the distinguished President of the Parliament” used both hands to indicate the referred person which is “the president of the parliament”, in a certain way carries the meanings of appreciation and respect to express humility. The researcher considers that these effects are very significant in the beginning of every speech, especially prior entering into the subject and suggest arguments because the audience do not know the debater’s character. Therefore, it is recommended that debaters use a variety of physical motions to give a good impression of him. Thus, this phase can be termed as editorial welcoming. The third speaker P3 used two motions to distinguish between two things in the next statement “and created Moses to Pharaoh, and create the Israel to Palestine,” where this metaphor made the idea more meaningful to the audience as well as to get better understanding of what is said.

Other than that, the statement of welcoming in Arabic “السلام عليكم”, ‘peace be upon you’, the researcher believes, is supposed to be said quietly, and the debater P3 used good kinetic method to use both hands to welcome, which made the audience feel comfortable and calm.

If we refer back to P1, we will find that the debate was not indicated using two examples of motions and the debater was able to use his hands to refer to it or to use her fingers to the enumeration. In addition, the debater was clasping fingers during the diction process. Nevertheless, the use of both hands is mostly not a negative aspect because the debater can use his fingers to enumerate certain points.

Moreover, it was noted that P5 was clasping her fingers when saying: “I start with the name of Allah the most companion and the most Merciful,” and “telling you”. The researcher believes that it was better for her to use her fingers or hands in a way or another, which had a dramatic impact upon the audience.

67.6 Visual Contact

As shown in the Table 67.3, the researcher noticed that the errors in visual contact are frequent in certain positions and these errors need a close observation. For example, when addressing the audience using the sound “O”, the speaker should direct his look at people and look at their faces.

Furthermore, P1, P4, and P6 did not use the visual contact in the statement “our dear audience” all of them were reading from the sheet, not looking at the audience,

Table 67.3 Analysis of visual contact

Observation	Analysis
P1, P2, and P3 none of them used the Visual contact during addressing the audience like “our valued audience” all of them were reading from the sheet, and not looking at the audience, which indicates un-readiness of the debater, and lack of self-confidence	Visual contact

Table 67.4 Emotions analysis

	Emotions	Analysis
Misunderstand of debater to face motions	Negative tools such as no and not reveal to seriousness and interaction	Emotions
Lack of smile on audience face which express not clear understanding		
Lack of interaction at the time of the serious things		

which indicated un-readiness of the debater as well as lack of self-confidence. The same thing happened with P1, P2 and P5. These debaters said: “Participation in student’s activities help in the academic progress,” and P5 also did the same when he/she said “Participation in student activities does not help in the academic progress”. The purport of the talk is that visual contact is very significant while looking at the ground or sheet, and not looking to the audience is a negative aspect because it indicates lack of willingness and self-confidence.

67.7 Emotions

More relevant aspects to the art of diction are gesture and people are different in their gestures, but a good debater can still use the proper and appropriate gestures at the proper time to support his speech and make it meaningful.

From the previous observation, the researcher found several positive and effective emotions used by the debaters (Table 67.4). One of these emotions was the smile. However, other debaters neglected this motion, which is considered very significant in any speech. Moreover, humour and wittiness help to make the audience less bored where other emotions were observed.

67.8 Summary

The art of speech or diction is a skill to improve the Arabic language and debate is an effective tool to achieve it. The main motive behind doing this research was the urgent need to conduct further studies about this art as a vital tool to reduce the

shyness and the fear of facing people and to enable students to speak fluently in Arabic. Furthermore, learning the body languages such as gesture, visual contact, and hands motions has a vital role in the daily communication. The speaker, who can master all of these motions, can easily express what he wants and delivers his words to the audience in a short way. He/she will also be able to capture the audience's attention.

References

- al-Farisi & Salah Awadullah. (2009). *Al-dalil al-amaliyafunun al-munazarah bi al-lughatilarabiyyah. Al-Tab'atul Ula*. Maliziya: Darul al-Tashihlila'mal al-akadimiyyah.
- al-Sadiq & Hasan. (2002). *al-Munazarah fi al-adab al-Arabiy- al-Islamiy*. Giza. Al-syarikah al-misriyyah al-alamiyahliannasyr.
- Austin, J. F., & Steinberg, D. L. (1999). *Argumentation and debate. Critical thinking for reasoned decision making*. Boston: Wadsworth Cengage Learning.
- De Vito, J. A., & Hecht, M. L. (1990). Perspectives on nonverbal communication: The how, what and why of nonverbal communication. In J. A. De Vito & M. L. Hecht (Eds.), *The nonverbal communication reader* (pp. 3–17). Prospect Heights: Waveland Press.
- Goldin-Meadow, S. (2004). Gesture's role in the learning process. *Theory Into Practice*, 43(4), 314–321.
- Kelly, S. D., & Goldsmith, L. H. (2004). Gesture and right hemisphere involvement in evaluating lecture material. *Gesture*, 4(1), 25–42.
- Marican, S. (2009). *Penyelidikan Sains Sosial Pendekatan Pragmatik* (2nd ed.). Malaysia: Perpustakaan Negara Malaysia.
- Mursi & Khalid Tawakkkal. (2008). *Fan al-Ilqa' wa al-tahrir al-kitaby: Al-tab'atul Ula*. Kaherah: Maktabah al-Adab.
- Ramzi al-Husamiy. (2004). *Fan al-Khatabah*. Beirut: Dar Alim al-kutub.
- Schober, O. (1999). *BedenDili* [Körperesprache (originally published in Germany) – Body Language] 4th ed. (Translator to Turkish: SüedaÖzbent). İstanbul: Arion Publications.
- Snider, A. C. (2008). *The code of the debater: Introduction to policy debating*. New York: International Debate Education Association.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research*. Newbury Park: Sage.
- Turk, C. (1985). *Effective speaking: Communicating in speech*. London: Chapman & Hall.
- Warfield, A. (2001). Do you speak body language? *Training and Development*, 55(4), 60–67.
- Wood, R. V., & Goodnight, L. (1987). *Strategic debate*. Lincolnwood: National Textbook Company.
- Yeşil, R. (2008). Evaluation of body language behaviour in a class debate. *Social Behavior and Personality*, 36(7), 893–902.
- Yusuf Abu al-Adus. (2007). *Al-Maharat al-lughawaiyyahwa fan al-ilqa'*. Yarmouk: Dar al-masirah li annasyrwa al-tauzi' wa al-taba'ah.