Geok Bee Teh
Siew Chee Choy *Editors*

Empowering 21st Century Learners Through Holistic and Enterprising Learning

Selected Papers from Tunku Abdul Rahman University College International Conference 2016

Springer

Empowering 21st Century Learners Through Holistic and Enterprising Learning

Geok Bee Teh · Siew Chee Choy
Editors

Empowering 21st Century Learners Through Holistic and Enterprising Learning

Selected Papers from Tunku Abdul Rahman University College International Conference 2016

Springer

Editors
Geok Bee Teh
Tunku Abdul Rahman University College
Kuala Lumpur
Malaysia

Siew Chee Choy
Tunku Abdul Rahman University College
Kuala Lumpur
Malaysia

ISBN 978-981-10-4240-9 ISBN 978-981-10-4241-6 (eBook)
DOI 10.1007/978-981-10-4241-6

Library of Congress Control Number: 2017934621

Printed on acid-free paper

This Springer imprint is published by Springer Nature
The registered company is Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Preface

The genesis of this work came about as a result of the TARC International Conference 2016 (TIC 2016) organized by Tunku Abdul Rahman University College (TAR UC). The theme of the conference "Empowering 21st century Learners Through Holistic and Enterprising Learning" was intended for participants to reflect on the rapidly growing and globalized online learning platform embraced by many universities around the world, the ever changing methodologies employed in teaching and learning, and the enhancements needed in curriculum development and assessments to support the rapidly changing education scene. Hence from this main theme, the three sub-themes to steer the conference were decided:

- Globalized Online Learning
- Methodologies and Strategies for Holistic and Enterprising Learning
- Curriculum Enhancement and Pedagogical Models

With the focused but flexible sub-themes, TIC 2016 managed to gather over 137 participants from 14 countries and many universities, as well as our own TAR UC researchers to present their research on October 17–18, 2016. Prior to the conference, the Editorial Committee was tasked to select papers for this publication from all that were submitted for the conference. There were a total of 70 articles accepted and included in the conference proceedings which had undergone a stringent and rigorous double-blind reviewing process by at least two reviewers (one international and one national). The papers in this publication are the result of many hours of discussions and debates on which of the conference papers to invite for inclusion into this publication. We the editors wish to extend our gratitude and thanks to all the TIC 2016 Editorial Committee Members who have contributed to the successful completion of this special edition.

With the limited space in this book, our selection had to include articles for each sub-theme. The articles here are organized in such a way so as they convey the theme of the conference with a focus on empowering twenty-first-century learners through holistic and enterprising learning approaches. We hope you enjoy reading the articles that follow and find the new ideas presented an effective means to continuously empower your students' learning by enhancing your teaching skills.

Chairman and Subtheme Chair of TIC 2016 Editorial Committee

Kuala Lumpur, Malaysia

Geok Bee Teh
Siew Chee Choy
Editors-in-chief

Contents

Introduction to TIC 2016 Conference Closing Commentary

Principles and Passion: Finding Purpose through Re-inquiry

Conferences like this and the great effort that goes into realizing them serve as a valuable hub of knowledge and a bastion of inspiration. Over the course of two days, we have been able to individually and collectively exchange findings and interrogate trends by putting them to the test as we share research and practices. The results can provide renewed application to our teaching and learning endeavors.

My primary goal in this closing commentary is to acknowledge a handful of the ideas that have been generated over the last two days and provide two tools that you can immediately apply to your observations. I will incorporate some of your perspectives as shared through a collective poll. In so doing, I want to give you another opportunity to reflect on which ideas have resonated with you so you can solidify the action you might take upon leaving. While it is true that insights are ideas that deserve action, it is also true that we often face a murkiness of thought around process and outcome. In turn, this can yield to trepidation that impacts our vision and mission.

On the other hand, we cannot always wait for 100% clarity before we take our next steps. Therefore, we have the task to harmonize our questions, concerns, and judgments with our instincts so to position our next moves. Two tools that we can instantly apply to our observations for this end include the Proprioceptive Question and Parts-to-Whole analysis. Both of these tools can serve as clarifying agents applicable at any time and in any place.

First, allow me to briefly introduce myself. My name is Susan D'Aloia and I happily work for Blackboard as a client manager. Specifically, I support faculty and staff to realize effective learning experiences with the solutions Blackboard provides so that we as educators can create and determine our aims with technology and not the other way around. In short, technology itself is never the guidance. The guidance must come from within just as we seek outside perspective based from achievement and success.

I would like to continue by giving mention to just a handful of the takeaways from some of the keynotes and plenary sessions. On the first day of conference, we began with the ideal that the internationalization of programs, policies, and

practices can and will extend and harmonize with local culture as opposed to dominating it. Later, a presentation of the Dual Award program detailed how Malaysian students embrace the colder climate of the UK, forfeit delicious noodles and rice, and become empowered embracing a stretched out search for answers as they recognize the role of cultural differences of beer consumption and how that may or may not motivate potential marketing.

In the afternoon, Professor and CEO John Latham unveiled the dynamic practices of the Entrepreneurial University of Coventry, conveying the institution's commitment not only to foster competence within the domain of the budding entrepreneur's imagination but also to develop the learner's gaze to recognize the traps of a trajectory that reproduces failed businesses. Later Dr. Wan-Lee Cheng gave a historical context of service learning rooted during the era of the American civil war under the direction of President Abraham Lincoln. He further reminded us of the risk of losing social opportunities in our current age of rapid development of technology that forfeits personal connection. He provided a fearless vision of an outcome-based education committed to humanistic dialects of self and spirit and nature and cooperation with the aim of balance.

Perhaps echoing more insights from parallel sessions over the two days of conference will further spark your recollections as well. Learner's Awareness of Questionnaires stressed the importance of the four-factor solution regarding measurement tools. During a team building session, working participants experienced a model of mandatory contribution that builds cooperation and accountability. Later, the authors of Embedding Digital Literacies in Curricula reminded us of the danger of adhering to a digital native/digital immigrant dichotomy that assumes a fluency and competence with our learners. In fact, our work as educators must address this learning curve and allow learners to flourish.

I would like to share a sample of the results from the collective poll where some audience members shared observations of what impressed them and how they have been challenged. From this partial compilation of remarks, we can begin to understand our collective motivation by exploring our particular implications and what they could potentially entail. One method we can use is the "PQ," or the Proprioceptive Question, which is a part of methods conceived by writers and educators Dr. Linda Metcalf and Dr. Tobin Simon, (Metcalf and Simon 2002). Simply put, we can instinctually select the words from our statements that might hold power and ask, "What do I mean by_____?" For example, "What do I mean by *brain race*?" "What do I mean by *twenty-first century needs more than*?"[1]

[1]Dr. Metcalf and Dr. Simon prescribe timed writes of 20 minutes. They guide the writer to interrogate loaded or abstract words and not skate over ideas but allow them to surface and see them through. Potential disruptions within the writing process can be written out. Upon completion of the timed write, Metcalf and Simon instruct to write down thoughts heard but not written. They further suggest that "the write" is a part of a larger story and ask the writer to identify a larger narrative. Finally, they inquire about the possibility of future writes.

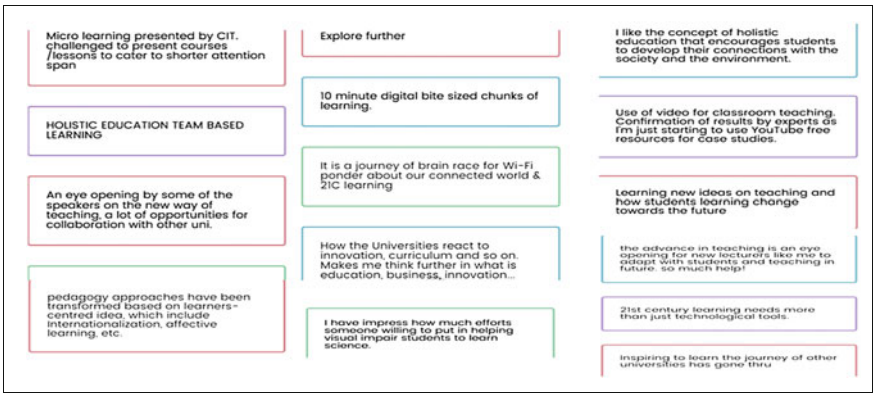


Diagram 1

Recently, I went to the zoo in Singapore and felt struck by a school of fish that I must have observed for at least ten minutes, quite a long period of un-interrupted time in our current day and age! The fish were uniformly silver and black; initially, the patterns of such color schema seemed similar but upon closer examination each fish was different in aesthetic composition in the particular detailing of the silver and black. In the same vein, however similar your comments may seem or the terminology used, it is worthwhile to investigate your instincts around such written comments before your recollections fade, which will inevitably happen as we leave the venue of this conference.

The next tool I would like to share with you is called Parts-to-Whole analysis.[2] To apply, we begin by identifying a whole. Then, we identify the parts to the whole. We take each part and ask the question, "What would happen if the parts were missing?" We use our response to determine the function of the parts. All of our responses become the information that allows us to reach a conclusion or an interpretation of the whole object in relation to its parts.[3] Subjective interpretations are welcome.

I became particularly inspired when I attended Initial Considerations for Transnational Education Providers Regarding the Mapping of the East African

[2]It is difficult to credit the origins of this process. Currently, it might be seen as a common knowledge process. As an educator, I have been using it within different capacities since 2002 upon learning it as part of Brain-Based learning training in New York City, fundamentally influenced by the work of Caine and Caine, expert scholars, and curriculum developers. I therefore credit the progenitor of this process as partially conceived out of the work *Making connections: Teaching and the human brain published by* Caine, R.N., & Caine, G. in 1991.

[3]This process can be interpreted concretely as in a whole object such as car. Or it can be interpreted abstractly as in whole concept such as a consumer trend of using a new app. The whole can also be interpreted hypothetically in the case of one of our whole observations where we shape a work in progress hypothesis of sorts. This latter utility I will use an as an example as it relates to a panel presentation I attended at this conference.

Qualifications Framework by Ciaran O'Leary. This presentation considered how quality assurance must travel while recognizing the challenges around such implementation. So let us consider equitable model of transnational education as a whole. A part could include micro-credentialing through localized badges.

What would happen to an equitable model of transnational education without localized badges? Local skills and previously learned competencies would be under-realized. Consequently, scaffolding opportunities toward the realization of more encompassing globalized skills would have less mastery to build upon. Consequently, the role of micro-credentialing within localized badges functions to recognize learned realities within the local context of the learner. They further can serve as a base to foreground new competencies for the globalized world. I do not know if any of that is true. It is simply a suggestion that I just made up. More application and communication with peers would prove whether or not this assertion warrants pursuing and in which direction.

When you return to your institution, you will once again reenter the push-pull factors that impact the rewarding work you do as an educator. As you find yourself in the throes of your work, I encourage you to take an intrapersonal mental pathway that unites your principles and passion as a priority. Do not initially capitulate to a Google Search to find answers but instead resurrect your recollections from this conference without relying on technology. Bring them to life by giving your individual human process its due time and consideration. Doing so will surface answers that provide worthwhile clarity.

Susan D'Aloia
Client Success Manager ASIA,
Blackboard Inc.

References

Caine, R. N., & Caine, G. (1991) *Making connections: Teaching and the human brain.* Alexandria, VA: Association for Supervision and Curriculum Development, Print.

Metcalf, Linda Trichter, & Tobin Simon. (2002) *Writing the mind alive: The proprioceptive method for finding your authentic voice.* New York: Ballantine, Print.

International Panel of Peer Reviewers

Prof. Alistair McCulloch, Professor, Head, Research Education, Learning and Teaching Unit , Research & Scholarship, City East Campus, University of South Australia, Australia
Assoc. Prof. Dr. Denise Beutel, Associate Professor, School of Cultural and Professional Learning, Faculty of Education, Queensland University of Technology, Brisbane, QLD
Dr. Gavin Sanderson, Senior Lecturer, Learning and Teaching Unit, Teaching & Learning Services, City West Campus, University of South Australia, Australia
Dr. Shaun Sydney Nykvist, Senior Lecturer, School of Curriculum, Queensland University of Technology
Prof. David McClean, Professor, Robert Gordon University
Prof. Christopher O'Neil, Professor, Robert Gordon University
Dr. Christine McDonald, Science educator in the School of Education and Professional Studies, and Griffith Institute for Educational Research at Griffith University
Prof. Parlo Singh, Research Professor, Griffith University for Education Research
Dr. Ralf Burbach, Assistant Head of School of Hospitality Management and Tourism, Dublin Institute of Technology
Dr. Tina Bass, Deputy Head of Strategy and Applied Management, Faculty of Business, Environment and Society, Coventry University
Dr. Panagiotis Andrikopoulos, Associate Head of Economics, Finance and Accounting (Applied Research), Coventry University
Dr. Gearóid Ó Súilleabháin, Head of Department of Technology Enhanced Learning, Cork Institute of Technology
Dr. Breda Kenny, Head of Hincks Centre for Entrepreneurship Excellence, Cork Institute of Technology
Dr. Stephen Cassidy, Dean of Academic Quality Enhancement and Acting Dean of Graduate Studies, Cork Institute of Technology
Dr. Neil Mitchell, Senior Lecturer, School of Electronics, Electrical Engineering and Computer Science Queens University of Belfast
Prof. Maricar S. Prudente, Professor, De La Salle University, Philippine

Dr. Christine C.M. Goh, Professor, Dean, Graduate Studies and Professional Learning, MIE/NTU, Nanyang Technological University, Singapore
Prof. Prithwi Raj Subramaniam, Professor, Department of Health Promotion and Physical Education, Ithaca College, New York, US
Dr. Alexandru-Ionuţ Petrişor, Assistant Professor, Faculty of Urbanism, "Ion Mincu" University of Architecture and Urbanism, Bucharest, Romania
Dr. Kristen Moran, Assistant Professor of Education, Campbell University
Dr. Boris Abbey, Lundy Chair of the Philosophy of Business, Lundy-Fetterman School of Education, Campbell University
Dr. Yen-Ping Kuo, Chair and Professor of Microbiology and Immunology, Assistant Dean of Curriculum, Jerry M. Wallace School of Osteopathic Medicine, Campbell University

National Panel of Peer Reviewers

Assoc. Prof. Dr. Nor Azmi Bin Mostafa, Associate Professor, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, Perak
Assoc. Prof. Dr. Raja Nor Safinas Binti Raja Harun, Associate Professor, Faculty of Languages and Communication, Universiti Pendidikan Sultan Idris, Perak
Prof. Dr. Gurnam Kaur A/P Gurdial Singh, Professor, Faculty of Education, Universiti Teknologi MARA, Malaysia
Assoc. Prof. Dr. Pauline Goh Swee Choo, Associate Professor, Faculty of Education and Human Development, Universiti Pendidikan Sultan Idris, Perak
Prof. Dr. Ewe Hong Tat, Professor, Vice President, Universiti Tunku Abdul Rahman
(the late) Assoc. Prof. Dr. Teh Chee Seng @ Elvis Teh Chee Seng
Associate Professor, Vice President (Student Development and Alumni Relations) Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman
Dr. Cheah Phaik Kin, Assistant Professor, Department of Public Relations, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman, Perak
Dr. Priscilla Moses, Assistant Professor, Deputy Dean (R&D) and Postgraduate Programme, Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman
Ms. Saraswathy Thurairaj, Lecturer, Faculty of Creative Industries, Universiti Tunku Abdul Rahman
Dr. Siew Pei Hwa, Assistant Professor, Faculty of Creative Industries, Universiti Tunku Abdul Rahman
Dr. Lee Jer Vui, Assistant Professor, Lee Kong Chian Faculty of Engineering & Science, Universiti Tunku Abdul Rahman
Mr. Paul Ang Ban Hock, Senior Lecturer, Faculty of Creative Industries, Universiti Tunku Abdul Rahman
Dr. Suraini Binti Mohd Ali, Lecturer, Faculty of Major Languages Studies, Universiti Sains Islam Malaysia, Negeri Sembilan
Dr. Anushia Inthiran, Lecturer and Course Coordinator Master of Business Information Systems (MBIS) Monash University Malaysia

Dr. Noor Saazai Bt Mat Saad, Senior Lecturer, Faculty of Major Languages Studies, Universiti Sains Islam Malaysia, Negeri Sembilan, Malaysia
Prof. Dr. Chan Yuen Fook, Professor, Faculty of Education, Universiti Teknologi MARA, Shah Alam, Malaysia
Prof. Dr. Gurnam Kaur A/P Gurdial Singh, Professor, Faculty of Education, Universiti Teknologi MARA, Shah Alam, Malaysia
Assoc. Prof. Dr. Izaham Shah Bin Ismail, Associate Professor, Faculty of Education, Universiti Teknologi MARA, Shah Alam, Malaysia
Dr. Malini A/P N G Ganapathy, Teacher DG 44, School of Languages, Literacies and Translation, Universiti Sains Malaysia, Penang
Dr. Tan Wee Hoe, Senior Lecturer, Faculty of Art, Computing and Creative Industrry, UPSI
Mr. Low Wai Leon, Centre for Pre-University Studies, TAR UC
Dr. Cheng Sau Keng, Faculty of Social Science, Arts and Humanities, TAR UC
Dr. Lai Chooi Seong, Faculty of Social Science, Arts and Humanities, TAR UC
Ms. Chan Eang Teng, Faculty of Social Science, Arts and Humanities, TAR UC
Dr. Cecilia Chai Ming Sing, Faculty of Social Science, Arts and Humanities, TAR UC
Dr. Tang Mui Joo, Faculty of Social Science, Arts and Humanities, TAR UC
Dr. Halimatun Saadiah Abdul Manap, Centre for Nation Building and Languages, TAR UC
Dr. Marzita Mohamed Noor, Centre for Nation Building and Languages, TAR UC
Assoc. Prof. Dr. Amy Yeo, Faculty of Accountancy, Finance and Business, TAR UC
Assoc. Prof. Dr. Kwek Choon Ling, Faculty of Accountancy, Finance and Business, TAR UC
Ms. Chen @ Chong Sheau Huey, Faculty of Applied Sciences and Computing, TAR UC
Dr. Lim Teck Hock, Faculty of Applied Sciences and Computing, TAR UC
Assoc. Prof. Dr. Wee Eng Hoe, Faculty of Applied Sciences and Computing, TAR UC
Assoc. Prof. Dr. Choy Siew Chee, Head, Perak Branch, TAR UC
Assoc. Prof. Dr. Janice Toh Guat Guan, Head, Penang Branch, TAR UC

Part I
Globalised Online Learning

Students' Satisfaction Towards Online Learning Systems: Assessing Its Internal and External Factors

Sharon Tan, Francis Chuah and Hiram Ting

Abstract This paper examines the internal factors (Internet self-efficacy and self-motivation) as well as an external factor (interaction) which affect university students' level of satisfaction towards online learning systems. Field data were collected from 282 students from a public university. Data were analysed using multiple regression analysis. The outcome of the analysis suggests that these factors are significant predictors to students' level of satisfaction when using a university's online learning system.

Keywords Interaction · Internet self-efficacy · Online learning · Self-motivation · Satisfaction

Introduction

The practice of infusing Web-based technologies into higher education has provided enriching learning experiences in this field. A shift towards embracing technology by universities is to provide continuous learning to the twenty-first century learners. Despite many studies investigating this phenomenon, previous literature falls short in providing insight towards online learning satisfaction

S. Tan (✉)
Faculty of Accountancy, Finance and Business,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: tans@acd.tarc.edu.my

F. Chuah
School of Business and Management, College of Business,
Universiti Utara Malaysia, Kuala Lumpur, Malaysia
e-mail: francischuah@uum.edu.my

H. Ting
Institute of Borneo Studies, Universiti Malaysia Sarawak,
Kuala Lumpur, Malaysia
e-mail: hiramparousia@gmail.com

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_1

amongst university students in Malaysia. The changes in the education landscape are driven by the popularity of many programme offerings being made available online (Ke and Kwak 2013). As students are the core users, these Web-based learning systems are tasked with the responsibility of helping students achieve their learning outcomes and satisfaction in fulfilling their overall education goals (Wei et al. 2015). This paper aims to assess both the internal and external factors affecting university students' satisfaction with online learning systems. Such assessment can help determine the effectiveness of knowledge construction that has taken place (Zhu 2012).

The characteristics of online learning systems satisfy the needs of modern learning in society signalling the importance of executing these systems effectively (Sun et al. 2008). In addition, past studies on this subject have not identified critical factors from a holistic viewpoint. Therefore, building on prior literature, this study proposes a research model that examines both the effect of internal factors (Internet self-efficacy and self-motivation) and an external factor (interaction) of students' characteristics on their level of satisfaction towards the online learning system.

Research Problem

Rapid acceleration in technology has revolutionized traditional learning methods into an entirely new educational platform and industry. These new technologies have profoundly enhanced the learning experiences for both students and instructors with an array of tools to facilitate engagement and motivation. Earlier reports by Chen and Jang (2010) identified the importance of changing learners' behaviours as the key to achieve online learning success instead of course design and learning context.

Traditional face-to-face education is no longer considered as the only way to transfer knowledge (Hiltz and Turoff 2005). Studies reveal that there is a growing tendency towards enrolling in Internet classes because of its simplicity and benefit (Eom et al. 2006; Allen and Seaman 2010). Consequently, the potential use of Web-based technologies in education has propelled many universities in setting up portals and offering programmes online to bolster conventional teaching methods (Khalid et al. 2006). Moreover, when compared to conventional learning environments, online learning systems eliminate geographical and physical limitations.

The simplicity and convenience of online learning, nevertheless, does not come without a price. Billions are spent on building systems that facilitate online learning. Notwithstanding the total amount of time and money spent in developing the systems, it does not necessarily justify success, thus causing vast amounts of losses. Hence, to measure the effectiveness and the usefulness of online learning systems that warrant the success of online learning systems implementation, Alavi et al. (1995), as well as Graham and Scarborough (2001) noted that it is crucial to evaluate the level of its users' satisfaction. Goi and Ng (2009) also suggest that with a higher satisfaction level, Web-based programs will have greater opportunities to

influence learners' participation in future. In spite of its magnitude, little has also been done to assess the effect of key factors, such as Internet self-efficacy and self-motivation, as well as interaction, on students' satisfaction towards online learning. It is therefore important to inquire about students' level of satisfaction and their perceptions on the overall impact of their learning experiences through the digital platform. This is vitally important because online education is becoming a fast-growing delivery method in higher education (Bolliger and Wasilik 2009).

Objectives of the Study

Amidst the existence of a plethora of evidence documenting students' satisfaction towards online learning, such investigations are only limited to areas, such as the content of the online learning courses (i.e. perceptions towards the content of the course and structure of the course and how it affects students' satisfaction). Hence, there is a need for this study to examine a regression-based model for students' satisfaction towards online learning system involving students' internal and external characteristics, such as Internet self-efficacy and self-motivation, and interactions. The research model is based on two earlier studies by Kuo et al. (2014) and Eom et al. (2006), which investigated the level of satisfaction towards online learning. This study, however, will examine the level of students' satisfaction towards the online learning system.

Specifically, this study intends to achieve the following objectives:

(i) To determine the relationship between Internet self-efficacy and satisfaction towards the online learning system,
(ii) To determine the relationship between Internet self-motivation and satisfaction towards the online learning system and
(iii) To determine the relationship between interaction and satisfaction towards online learning system.

Research Methodology

This study was conducted using undergraduate students from one of the local universities in Malaysia. It was a quantitative study whereby judgmental sampling was used to sample students who were at least at their sophomore year. The underlying reason for such criterion is that these students had been exposed to at least a one-year experience in using the university's online learning system. Hence, these students were deemed to be able to provide their opinions based on their perception and experience pertaining to the use of the university's online learning system.

Online questionnaires were used to collect data from the target respondents. Students that were keen to participate in this survey were given the URL link directing them to the online questionnaire Website. Answers were made compulsory in such a way that students had to complete every question on each page so as to proceed to subsequent page and submit. Hence, missing data were not an issue.

The instruments used for this study were derived from the past literature. For internal factors, Internet self-efficacy was measured using a 5-item measure developed by Kuo et al. (2014) while self-motivation was assessed using a 2-item measure developed by Eom et al. (2006). Both measurements achieved good reliability scores of 0.839 and 0.732, respectively. Online learning system satisfaction, on the other hand, was measured using a 4-item measure. The reliability score of the measure was 0.812. Lastly, interactions were measured using a three-dimensional scale developed by Kuo et al. (2014) which was consisted of learner–learner interactions (4 items), learner–instructor interactions (5 items), learner–content interactions (3 items). All three dimensions achieved satisfactory reliability scores of 0.731, 0.786 and 0.794, respectively. The summated scores of all the dimensions were then used for subsequent analysis.

SPSS was used to perform the analysis. Specifically, Pearson correlation and multiple regressions analysis were conducted to assess the postulated relationships of the study.

Results/Discussions

Prior to assessing the relationship between the constructs, Harman's single-factor test was carried out to address the issue of common method variance (CMV) due to collecting data from a single source. The Harman's one single factor test yields a result of 29% of variance explained for the first factor. This percentage is lower than the threshold value of 50%, indicating that CMV is not an issue in this study.

Pearson correlation analysis was then conducted to assess the bivariate relationship between constructs. The results suggest that each bivariate relationship is found to be significant and positive. Both Internet self-efficacy ($r = 0.461$) and self-motivation ($r = 0.523$) are found to be positively and moderately associated with students' satisfaction. However, interactions are strongly associated with students' satisfaction ($r = 0.640$). Tables 1 and 2 depict the constructs correlation with the construct reliability value along the diagonal.

In the similar vein, prior to assessing the postulated relationships, all constructs in the study undergo the assessment of multicollinearity. A variance inflation factor (VIF) value of more than 3.3 indicates possible collinearity issue amongst constructs. Nonetheless, the results from the assessment as shown in Table 3 suggest that multicollinearity is not an issue as the values for the predictors are lower than the threshold value of 3.3.

Results from multiple regression analysis suggest that the three predictors, namely Internet self-efficacy, self-motivation and interactions explain 45% of

Table 1 Constructs correlation

	No. of items	Mean	SD	IS	SM	SAT	INT
Internet self-efficacy	5	3.587	0.644	(0.839)			
Self-motivation	2	3.495	0.674	0.486[a]	(0.732)		
Satisfaction	4	3.516	0.730	0.461[a]	0.523[a]	(0.812)	
Interaction	3	3.421	0.564	0.528[a]	0.613[a]	0.640[a]	(0.657)

[a]Correlation is significant at the 0.01 level (two-tailed)
Values along the diagonal represent Cronbach's alpha reliability

Table 2 Constructs correlation (first-order level—dimensions of learning interaction)

	No. of items	Mean	SD	ISE	SM	SAT	LLI	LII	LCI
Internet self-efficacy	5	3.587	0.644	(0.839)					
Self-motivation	2	3.495	0.674	0.486[a]	(0.732)				
Satisfaction	4	3.516	0.73	0.461[a]	0.523[a]	(0.812)			
Learner–learner interaction	4	3.583	0.668	0.447[a]	0.494[a]	0.377[a]	(0.731)		
Learner–instructor interaction	5	3.161	0.715	0.317[a]	0.447[a]	0.504[a]	0.515[a]	(0.786)	
Learner–content interaction	3	3.518	0.807	0.456[a]	0.479[a]	0.582[a]	0.294[a]	0.386[a]	(0.794)

[a]Correlation is significant at the 0.01 level (two-tailed)
Values along the diagonal represent Cronbach's alpha reliability

Table 3 Assessment of multicollinearity

Constructs	Satisfaction
Self-motivation	1.700
Internet self-efficacy	1.473
Interaction	1.802

variances in students' satisfaction. Internet self-efficacy ($\beta = 0.131$, $t = 2.425$), self-motivation ($\beta = 0.176$, $t = 3.303$) and interaction ($\beta = 0.463$, $t = 7.741$) are found to be significantly associated with students' satisfaction. This indicates that all the three predictors are focal constructs in determining students' satisfaction towards an online learning system. Amongst the three predictors, interactions are found to have the largest effect over students' satisfaction, followed by self-motivation and self-efficacy (Table 4).

Table 4 Relationship assessment

	Beta	Std. error	*t*	*p*-value	Results
Self-motivation → satisfaction	0.176	0.063	3.032	0.003	Supported
Internet self-efficacy → satisfaction	0.131	0.061	2.425	0.016	Supported
Interaction → satisfaction	0.463	0.077	7.741	0.000	Supported

$R2 = 0.449$, $F(3, 278) = 75.382$, $p < 0.01$

Contributions of the Study

This study contributes to the body of knowledge in several ways. First, it provides an assessment of the factors influencing students' satisfaction towards online learning system. The assessment of the impact of both internal and external factors provides insight into the development of online systems. While it is important to develop a good online learning system, the providers and developers of the system should take student's ability in utilizing it into consideration. In practice, systems that are too sophisticated might be a problem for students who have low Internet self-efficacy. To some extent, students with low Internet self-efficacy may be unable to perceive the usage of specific complex functions embedded in the online learning system. This would lead to discouragement.

On the other hand, it is found that the level of satisfaction of students towards the online learning system is associated with the level of interaction that a student has when engaging with the online learning system. Notably, interesting functions and contents available on the online learning system as well as proactive interaction between learners and instructors through optimizing use of the function available in the online learning system would result in students' satisfaction. The access to audio and visual support executed in the online learning system would lead to excitement in utilizing the online learning system as an instrument to transfer knowledge. These virtual classrooms would then allow students to experience real-life classroom situations along with their instructors. As such, this will invariably enhance students' level of satisfaction towards online learning system. Moreover, the findings from this study also address the needs and concerns from the students' perspective and also their current capacity towards using the online learning platform as an educative function of acquiring knowledge.

Conclusions

This study proposed and tested a model that considered internal and external factors which affect students' satisfaction towards online learning system. Generally speaking, all the proposed relationships were found to be significant and positive, indicating the importance and relevance of these factors in the context of online learning system at institutions of higher learning. Since students were considered as

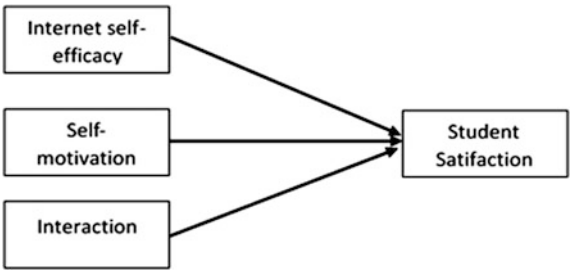


Fig. 1 Research model of the study

the most important users of the system, it is imperative to revisit the determining factors of their satisfaction towards the online system. The ability to identify factors determining their level of satisfaction is crucial as this will lead to the overall implementation success of the online learning system. The findings of this study will also provide relevant information for institutions to eliminate online learning systems that are deemed ineffective and to implement one that would practically benefit the students in their learning process and subsequent academic performance (Fig. 1).

References

Alavi, M., Wheeler, B. C., & Valacich, J. S. (1995). Using IT to reengineer business education: An exploratory investigation of collaborative telelearning. *MIS quarterly*, 293–312.

Allen, I. E., & Seaman, J. (2010). Class differences: Online education in the United States, 2010. *Sloan Consortium (NJ1)*.

Bolliger, D. U., & Wasilik, O. (2009). Factors influencing faculty satisfaction with online teaching and learning in higher education. *Distance Education, 30*(1), 103–116.

Chen, K. C., & Jang, S. J. (2010). Motivation in online learning: Testing a model of self-determination theory. *Computers in Human Behavior, 26*(4), 741–752.

Eom, S. B., Wen, H. J., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation*. *Decision Sciences Journal of Innovative Education, 4*(2), 215–235.

Goi, C. L., & Ng, P. Y. (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.

Graham, M., & Scarborough, H. (2001). Enhancing the learning environment for distance education students. *Distance Education, 22*(2), 232–244.

Hiltz, S. R., & Turoff, M. (2005). Education goes digital: The evolution of online learning and the revolution in higher education. *Communications of the ACM, 48*(10), 59–64.

Ke, F., & Kwak, D. (2013). Online learning across ethnicity and age: A study on learning interaction participation, perception, and learning satisfaction. *Computers & Education, 61*, 43–51.

Khalid, M., Yusof, R., Heng, C. T., & Yunus, M. R. M. (2006, June). *Virtual laboratory as an effective e-learning tool*. Paper presented at the B3—E-Learning, Euro Southeast Asia 2006, Singapore, Thailand.

Kuo, Y. C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education, 20,* 35–50.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education, 50*(4), 1183–1202.

Wei, H. C., Peng, H., & Chou, C. (2015). Can more interactivity improve learning achievement in an online course? Effects of college students' perception and actual use of a course-management system on their learning achievement. *Computers & Education, 83,* 10–21.

Zhu, C. (2012). Student satisfaction, performance, and knowledge construction in online collaborative learning. *Educational Technology & Society, 15*(1), 127–136.

Embedding Digital Literacies in Curricula: Australian and Malaysian Experiences

Rhian Morgan, Kathryn Meldrum, Sharon Bryan, Bronwyn Mathiesen, Nooraida Yakob, Norizan Esa and Azidah Abu Ziden

Abstract The ubiquity of Web 2.0 technologies means students require a base level of digital literacies in order to succeed in twenty-first century (C21st) learning environments. However, in the era of widening university participation, it is problematic to assume that students will enter higher education with the digital literacies required to support their academic endeavours. This paper describes the theoretical and pedagogical impetus behind two distinct approaches to enhancing digital readiness among undergraduate students in Australian and Malaysian universities. A comprehensive literature review and adoption of the Joint Information Systems Committee (Jisc) six capabilities of digital literacies model as the underlying theoretical framework guided the development of two distinct projects: one based at an Australian university and the other at a Malaysian university. The Australian approach focused on the development of a suite of online modules utilising an adaptive e-Learning platform (AeLP). The Malaysian approach focused

R. Morgan (✉) · K. Meldrum
Learning Teaching & Student Engagement,
James Cook University, Townsville, Australia
e-mail: rhian.morgan1@jcu.edu.au

K. Meldrum
e-mail: kathryn.meldrum@jcu.edu.au

S. Bryan · B. Mathiesen
James Cook University Library, James Cook University, Townsville, Australia
e-mail: sharon.bryan@jcu.edu.au

B. Mathiesen
e-mail: bronwyn.mathiesen@jcu.edu.au

N. Yakob · N. Esa · A.A. Ziden
School of Educational Studies, Universiti Sains Malaysia, Gelugor, Malaysia
e-mail: nooraida@usm.my

N. Esa
e-mail: norizanesa@usm.my

A.A. Ziden
e-mail: azidah@usm.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_2

on facilitating digital readiness among education students through student-created learning objects that simultaneously served as interactive pedagogical products and cognitive tools for facilitating learning. The cases presented demonstrate two distinct approaches to developing curriculum to support students' digital literacies that respond to two different contextual situations. Subsequent investigations into the student experience will inform future decisions regarding the use of AeLPs and cognitive tools in tertiary institutions, in addition to providing valuable information on the design of curriculum to support digital literacies instruction in the Australasian university context.

Keywords Digital literacies · Curriculum design · Higher education · Adaptive e-Learning · Cognitive tools

Introduction

The ubiquity of Web 2.0 technologies means students require a base level of digital literacies in order to succeed in twenty-first century (C21st) learning environments. However, in the era of widening participation, it is problematic to assume that students will enter higher education with the digital literacies required to support their academic endeavours (Kennedy et al. 2009). Even students with high ICT skills "do not necessarily expect to use these technologies to support some activities, including learning" (Kennedy et al. 2009, p. 4). Consequently, it is necessary to develop pedagogical approaches to integrating digital literacies into curricula (Richardson 2013). This paper describes the theoretical and pedagogical impetus behind two distinct approaches to enhancing digital readiness among undergraduate students in Australian and Malaysian universities. In the Australian context, the approach consisted of an online digital literacies curriculum, authored using proprietary adaptive e-Learning software, and orientated towards digital literacies instruction among a multidisciplinary cohort of sub-degree students. In the Malaysian context, the project focused on student-created digital learning objects. Learning objects were designed by student teachers as cognitive tools to support learning and integrated into an education subject. Together, these approaches demonstrate methods for developing digital pedagogies to enable success in technology-rich university learning environments.

Research Problem

Both Malaysia and Australia are rapidly expanding access to higher education. In this context of widening participation, the ability to engage with learning technologies will be key to success at university. The importance of institutional support for students in the effective use of learning technologies is acknowledged in

benchmarks set by the New Media Consortium (Johnson et al. 2015). However, diverse student cohorts result in variable levels of digital literacies in the classroom. Students require support to develop their usage of technology in academic contexts, and the provision of curriculum relevant methods for supporting digital readiness is one of the key challenges associated with teaching and learning in technology-rich environments. Consequently, this project seeks to answer the research question: How can targeted curriculum support the development of digital literacies for academic success in the higher education sector?

Objectives

The objective of this paper is to describe how a review of the literature has informed the design of two distinct approaches to embedding digital literacies instruction into university curricula: one approach is based at an Australian university and the other at a Malaysian university. These distinctive approaches demonstrate how digital literacies instruction can be tailored to suit specific cohorts and disciplinary requirements. Together, the cases illuminate the role interactive technologies can play in developing digital literacies and the manner in which research informed curriculum design can enhance students' digital readiness.

Methodology

A literature review exploring definitions of digital literacies and research into digital readiness in Australian, Malaysian, and international contexts was completed. The literature review was complemented by a review of pedagogical approaches to e-Learning design, exploring the intersections of authentic learning and the use of Web 2.0 technologies as cognitive tools. The findings of these reviews provided the theoretical, conceptual, and pedagogical impetus for individual campus teams in Australia and Malaysia to design their respective curriculum interventions.

Two different approaches, modelling distinct methods for digital literacies instruction, have subsequently been developed. The first approach consists of a suite of online modules, developed using an adaptive e-Learning platform (AeLP), that are currently being trialled at an Australian regional university within a bridging course designed to aid student's transition into tertiary study. This open access course attracts a diverse array of multidisciplinary students and serves as a "stepping stone" to Bachelor qualifications. The second approach is focused on facilitating digital readiness among preservice teachers, at a public university in Malaysia, through student-created learning objects that simultaneously serve as interactive pedagogical products and cognitive tools for facilitating learning. Together, these respective approaches show how digital pedagogies can enable the integration of digital literacies instruction into curricula.

Discussion

Throughout the design process, the *Educating the Net Generation* report and toolkit (Kennedy et al. 2009) was central to our understanding of digital literacies in the Australian context. Kennedy et al. (2009) administered an "experiences with technology" questionnaire, followed by qualitative data collection, to further explore student experiences with technology. Key findings from the questionnaire indicate that:

- there is little empirical support for the rhetoric that university students are digital natives and university staff are digital immigrants;
- there is great diversity in student experiences with and preferences for the use of technology in higher education;
- the data paints a complex picture of the technological experiences first-year university students bring to higher education.
  (Kennedy et al. 2009, p. 3)

These findings are confirmed in research conducted among Malaysian university students that similarly questions the classification of students as "digital natives" and highlights the complexity of students' relationship with technologies (Shariman et al. 2012). Shariman et al. (2012) also identified some distinct themes with regard to Malaysian students' engagement with digital resources that do not appear as prominently in the Australian literature, namely English language difficulties, which prevent students from reading and critically responding to online content, and a preference for immediacy that may lead to superficial engagement with online instructional materials. They also found that Malaysian students particularly preferred multimodal content that contained both audio and video information (Shariman et al. 2012).

In an international context, the US-based organisation, EDUCAUSE, also provided significant insight into the digital literacies of students. In 2015, their annual Study of Students and IT surveyed the digital practices of 50,274 students, at 161 institutions, in 11 different countries (Dahlstrom et al. 2015). Some key findings of the 2015 student survey were as follows:

- students' academic use of technology is widespread, but not deep;
- although omnipresent in students' lives, leveraging technology as an engagement tool is still evolving;
- students have a complex relationship with technology—they recognise its value but still need guidance in order to use it in meaningful ways.
  (Dahlstrom et al. 2015)

These findings confirm and expand on the outcomes of Australasian studies with regard to the lack of empirical support for the assumption that students are necessarily "digital natives". However, international findings regarding the omnipresence of technologies should be viewed with cation. Shariman et al. (2012) and Kennedy et al. (2009) both highlight the manner in which socio-economic status

(SES) can impact access to digital technologies. Shariman et al. (2012) found that low SES Malaysian students primarily accessed the Internet through university networks. These findings are mirrored among regional Australian students. In a university readiness assessment, 40% of the cohort participating in the curriculum intervention described below reported having no Internet access at home. Access to digital technologies is fundamental to the development of digital literacies, and while universities can act as access hubs, the literature indicates that guidance is necessary if students are to use digital technologies effectively for study.

Students require a base level of digital literacies in order to succeed in higher education; however, a definition of what actually constitutes digital literacies continues to develop. For example, Belshaw (2014) suggested that there are eight elements of digital literacies: cultural, cognitive, constructive, communicative, confident, creative, critical, and civic. In earlier work, Lankshear and Knobel (2003) identified three dimensions: operational, cultural, and critical. Operational literacies included competence with tools and procedures, while the cultural dimension was concerned with a person's ability to understand text in its cultural context. Finally, the critical dimension was described as an awareness that literacies are socially constructed. As investigations into the nature of digital literacies have advanced, the UK's Joint Information Systems Committee (Jisc) have been instrumental in

Fig. 1 Jisc's six capabilities model of digital literacies. Reprinted from "Building digital capability", by Jisc (2015a, b). https://www.jisc.ac.uk/rd/projects/building-digital-capability

bringing together these differing definitions and creating a conceptual framework (Jisc 2015a, b) that describes the digital literacies necessary for student success. The Jisc (2015a, b) six capabilities of digital literacies model (Fig. 1) acknowledge that digital literacies are multifaceted—incorporating multiple aspects of literacies and multiple literacies. The model identifies the variety of digital literacies that higher education students need to master—including ICT literacies; information, data, and media literacies; digital learning and self-development; digital creation, innovation, and scholarship; and identity and well-being. The comprehensive, yet flexible nature of this model resulted in its selection as an underlying theoretical framework for the development of the adaptive e-Lessons and student-created learning objects described below.

Adaptive e-Lessons

The e-Lessons, utilised in the Australian context, use an adaptive e-Learning platform (AeLP) to contribute a reusable technical solution to the challenges associated with digital literacies instruction among diverse cohorts in non-computer science-based disciplines. In doing so, the lessons build on findings from the 2007 to 2012 Adaptive Mechanics project, which demonstrated the capacity of adaptive tutorials (ATs) to advance the attainment of learning outcomes and comprehension of threshold concepts in first-year engineering subjects (Gangadhara Prusty et al. 2013). The Adaptive Mechanics project identified a positive correlation between the use of adaptive tutorials, student outcomesn and course satisfaction, as well as showing reductions in failure rates and significant improvements among under-prepared students (Gangadhara Prusty et al. 2013). The adaptive digital literacies lessons build on these successes.

In accordance with identified requirements of incoming students, the lessons are orientated around information data and media literacies. The lessons follow the narrative of a simulated group project, during which students direct virtual group members (henceforth referred to as non-player characters, or NPCs) through a series of research and data analysis activities culminating in the creation of a faux research poster. Throughout the lessons, two supporting characters in the form of a librarian and a lecturer guide the student user through lesson activities in addition to providing feedback and remediation where necessary. In accordance with the lesson narrative, each of the NPCs embodies specific strengths and common misconceptions. The student completing the simulation subsequently has to negotiate with their NPCs to solve a series of challenges orientated around information, data, and media literacies. There are three levels of adaptivity built into the platform used for the e-Lessons: adaptive feedback, adaptive learning pathways, and adaptive content authoring. The adaptive feedback allows for the provision of targeted help and enables the platform to address specific misconceptions in response to student input. Adaptive learning pathways provide varying sequences of content that facilitate fast movement through the lessons where information is known, or

remediation where necessary. Finally, adaptive content authoring and analytics enable instructors to track lesson outcomes, assess their efficacy, and adjust content and learning pathways accordingly. In combination, these various levels of adaptivity facilitate a holistic learning experience where active learning, explicit instruction, and evaluation combine to facilitate success among diverse learners.

Student-Created Learning Objects

In the Malaysian context, preservice teachers were required to participate in a learning task that asked them to create digital learning objects for use in teaching secondary school chemistry classes. The integration of this project into an existing education curriculum provided student teachers with the opportunity to enhance their IT, digital media, and design skills, while concurrently building their ability to select appropriate media for use in teaching chemistry (P21 2007). The task began with explicit instruction on the IT skills required to develop the digital objects. Students then translated their understanding of a chosen chemistry content area into a digital presentation to be used as a cognitive tool for learners in secondary schools.

Cognitive tools are computer-based tools that can be used to provide students with C21st skills, such as problem-solving, and help them become lifelong learners (Bransford et al. 2000; Jonassen 1996). A key aspect of the task asked the preservice teachers to design the digital learning objects in a way that could be easily understood by secondary school students. This design process required wide reading, which in turn enabled students to consolidate their own understanding of chemistry content and visualise abstract nanoscopic concepts through animation and simulation. Students utilised Microsoft PowerPoint, Adobe Flash, or iSpring to design learning objects that contained interactive elements. The design of this task exemplified the use of technology as a cognitive tool that can support student teachers to develop their abilities to comprehend and present information in a meaningful way (Jonassen and Reeves 1996). In addition, the students learned the design and IT skills associated with producing a cognitive tool for learning, thus contributing to the development of their own digital literacies. When mapped against the Jisc (2015a, b) six capabilities model, student teachers are developing digital learning and self-development, digital creation, innovation, scholarship, and ICT proficiency. Furthermore, the project integrates a self-assessment and reflection component that facilitates improvement of the digital object they have produced. C21st educators need to be able to design and create digital learning objects that can serve as cognitive tools to promote meaningful and active learning. This project enables preservice teachers to engage in this creative design process, thus providing an authentic learning experience where task design and the context in which learning occurs reflect processes of knowledge application in the “real world”.

Contributions

The two case studies presented in this paper demonstrate how literature on digital literacies can inform the embedding of digital literacies instruction into university curricula. Both projects respond to the requirement that universities provide explicit digital literacies instruction in order to facilitate student success in technology-rich learning environments. In the Australian case, an AeLP was used to combine processes of explicit instruction, active learning, and personalised feedback into a suite of stand-alone lessons that can supplement existing subject content. In the Malaysian instance, processes of digital learning and self-development were implicitly integrated into an existing curriculum through an IT-orientated project that utilised digital technologies as cognitive tools to enhance student learning. Together, these cases illuminate the role interactive technology can play in developing digital literacies and the manner in which digital literacies instruction can be tailored towards institutional, cohort, and disciplinary contexts. Giving students the opportunity to work creatively with digital learning objects (either as content users or creators) can provide structured support that is adaptable to individual learning levels.

Conclusions

Digital literacies are increasingly being recognised as a key attributes that students must develop in order to succeed in tertiary education and employment. Research suggests that digital literacies instruction is necessary and that the rhetoric of "digital natives" is not helpful when it comes to supporting students. Learners need support for developing transferable digital literacies that can be used in academic and professional environments. In order to support this, Jisc (2015a, b) has provided a model that can be readily adopted and deployed in curriculum development. The cases presented in this paper demonstrate two distinct approaches to developing curriculum to support students' digital literacies that respond to two different contextual situations: in the first case, through the use of an AeLP to provide explicit online instruction; in the second case, through the project-based learning using digital technologies as cognitive tools. Subsequent investigations into the student experience will inform future decisions regarding the use of AeLPs and cognitive tools in tertiary institutions, in addition to providing valuable information on the design of curriculum to support digital literacies instruction in the Australasian university context.

Acknowledgements The authors wish to acknowledge Universiti Sains Malaysia APEX: 7.4 Pengukuhan Institusi grant (Account number: 1002/PGURU/910154) for funding to carry out this study. We also acknowledge the support of university colleagues that have also contributed to this project.

References

Belshaw, D. (2014). *The essential elements of digital literacies*. Retrieved from http://dougbelshaw.com/ebooks/digilit/

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academy Press.

Dahlstrom, E., Brooks, D. C., Grajek, S., & Reeves, J. (2015). *ECAR study of students and information technology, 2015*. Louisville, CO: EDUCAUSE.

Gangadhara Prusty, B., Vrcelj, Z., McCarthy, T., Ojeda, R., & Gardner, A. (2013). An adaptive e-learning community of practice for mechanics courses in engineering: Final report. Retrieved from http://adaptive-mechanics.eng.unsw.edu.au

Jisc. (2015a). Building digital capability. Retrieved from https://www.jisc.ac.uk/rd/projects/building-digital-capability

Jisc. (2015b). *Digital capabilities: The 6 elements defined*. Retrieved from http://digitalcapability.Jiscinvolve.org/wp/files/2015/06/1.-Digital-capabilities-6-elements.pdf

Johnson, L., Becker, S. A., & Hall, C. (2015). *2015 NMC technology outlook for Australian tertiary education: A horizon project regional report*. Austin, TX: New Media Consortium.

Jonassen, D. H. (1996). *Computers in the classroom: Mindtools for critical thinking*. Englewood Cliffs, NJ: Prentice Hall.

Jonassen, D. H., & Reeves, T. C. (1996). Learning with technology: Using computers as cognitive tools. In D. H. Jonassen (Ed.), *Handbook of research for educational communication and technology* (pp. 693–724). New York, NY: Simon & Schuster Macmillan.

Kennedy, G., & Australian Learning and Teaching Council. (2009). *Educating the Net generation: A handbook of findings for practice and policy.* Retrieved from http://www.netgen.unimelb.edu.au

Lankshear, C., & Knobel, M. (2003). *New literacies: Changing knowledge and classroom learning*. Buckingham, England: Open University Press.

Partnership for 21st Century Skills. (2007). *Framework for 21st century learning*. Retrieved from http://www.p21.org/our-work/p21-framework

Richardson, W. (2013). Students first, not stuff. *Educational Leadership, 70*(6), 10–14.

Shariman, T. P. N. T., Razak, N. A., & Noor, N. F. M. (2012). Digital literacies competence for academic needs: An analysis of Malaysian students in three universities. *Procedia—Social and Behavioral Sciences, 69*, 1489–1496. doi:10.1016/j.sbspro.2012.12.090

Better Assessment Through Video: The Development of an Assessment Productivity App

Gearóid Ó. Súilleabháin and Shane Cronin

Abstract It is hard to overestimate the importance of assessment for the learning process. Assessment truly dictates how our learners understand their role and, consequently, how they spend their time: be it in tasks of rote learning or critical reflection and collaborative learning, or, as phenomenographical research suggests, in surface or deep learning approaches. Assessment regimes, however, tend, for various reasons, to be quite conservative and to rely predominantly on written coursework and high stakes written examinations. In this context of such deep seated traditionalism, our paper considers the development of a new video-based "assessment productivity" solution called "RedInk" as a way to support an authentic and alternative assessment approach that may well satisfy what are often conflicting requirements for assessment reliability and validity and for assessment that performs both a summative and a formative function.

Keywords Assessment · E-Assessment · Formative assessment · Online learning · Video

Introduction

It is difficult to overestimate the importance of assessment for the learning process and learner experience. Assessment truly is "at the heart of the student experience" (Brown and Knight 1994, p. 1): it dictates what our learners do, what they think learning is all about and, consequently, how they spend their time, be it in tasks of

G.Ó. Súilleabháin (✉) · S. Cronin
Department of Technology Enhanced Learning,
Cork Institute of Technology, Cork, Ireland
e-mail: gearoid.osuilleabhain@cit.ie

S. Cronin
e-mail: shane.cronin@cit.ie

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_3

rote learning or critical reflection and collaborative learning, or, as phenomenographical research suggests, in surface or deep learning approaches (see, e.g. Biggs 1987; Marton and Säljö 1976; Ramsden 2003).

It is significant therefore that assessment procedures, particularly at higher education, reveal, for various reasons, a deep seated conservatism. As Elton and Johnston (2002) conclude in their review of assessment in universities, "assessment is still pervaded by a largely unreflective traditionalism…" (p. 9). From the many different assessment tools and methods that could be used, from the many different ways in which learners could be allowed to evidence their learning, it appears that the vast majority of what determines our measurement of a learner's learning at higher education comes down to just two strongly dominant options: summative written examinations and continuously assessed written work.

Assessment Reliability and Assessment Validity

Why are written exams and other written forms of continuous assessment still so dominant? One way to explain the way in which institutes and systems of education cling to these methods and instruments has to do with the twin requirements for assessment reliability and assessment validity.

Reliability has to do with notions of objectivity, accuracy, consistency, fairness and repeatability.

The notion of repeatability in particular goes the heart of many people's intuitive notions of "good assessment" insofar as it refers to the extent to which assessment for the same learning, for the same person, under the same conditions should have the same outcome.

Validity though is also intuitively important. It has to do with the appropriateness of an assessment, its fitness for purpose and the extent to which it measures what it is somehow supposed to measure. While, borrowing perhaps from the world of social research and psychometrics, other forms of validity such as consequential validity and construct validity are sometimes discussed in an assessment context (see, e.g. Brown et al. 1997, pp. 241–242), these basic definitions suffice for current purposes: working from it we can say that an assessment method or task has low validity if it seems to be assessing something other than what was intended or what was supposed to. This can happen in obvious ways like posing challenges to a student that are simply not relevant to what their course of study was "about" or, perhaps less obviously, by teaching material at a certain level but requiring the student to then perform a much higher level in a related assessment task.

Both reliability and validity seem like things we would want from a "good" assessment but can often be at odds with each other or represent competing demands when we try to design assessment tasks or choose the right assessment methods. Multiple choice question tests, for instance, might well be a quite reliable way to assess students, but if we are interested in assessing problem solving or critical thinking or team work, they would not be very valid.

Reliability, in fact, does not work well where such complexities arise. As Knight (2001) argues, citing Breland and Messick (1999) and Linn (2000), "…Simplicity breeds reliability and reliability craves simplicity." (p. 7).

Since the publication of influential work by Rowntree (1987, originally published 1977), there has been an increasing acknowledgement of the negative consequences of over emphasising the need for reliability over validity. Rowntree himself makes an impassioned plea for "divergent assessment tasks that produce divergent responses from both students and assessors and from which both are likely to learn" (p. 198), but in face of this argument is the blatant fact that students and other stakeholders may not be happy with divergent results when assessment is "important," i.e. when it is "high stakes" and summative.

Summative and Formative Assessment

Summative assessment is an essential assessment that measures the sum of student's learning (Dunn et al. 2003, p. 18), it is a type of assessment that does not afford an opportunity for students to refine a submission or to improve their performance based on feedback and comments: formative assessment, by contrast, is intended and designed to provide exactly this opportunity.

In what is now regarded as a seminal piece of research, Black and Wiliam (1998) reviewed evidence gathering from some 250 sources relating to formative assessment and concluded it is shown to improve learning with relevant gains "amongst the largest ever reported for educational interventions" (p. 61).

Just as good reliability can sometimes get in the way of good validity, what can sometimes get in the way of good formative assessment is the desire for such assessments to also perform a summative function. Dunn et al. (2003) indicate that if any kind of grade is offered for an assessment that assessment becomes, de facto, a summative assessment even if the assessment does not come at the end of the learning cycle and constructive feedback is provided. Whether this is entirely the case or not, a plausible case can certainly be made that the more high stakes the assessment in summative terms, i.e. the more it "matters" in terms of a student's final exit grade, the harder it is to combine this with a formative function. For one thing, as Knight (2001) tells us, when the stakes are high "…those being assessed are likely to do all they can to conceal ignorance and suggest competence." (p. 3).

One of the key moves towards an alternative assessment approach with good reliability *and* good validity, which can also serve summative *and* formative functions, is, in the view of the authors, a turning away from written learning evidence to video-based learning evidence and a particular use of rubric assessment tools. Some brief reflections on both of these ingredients follow.

Video as Assessment Medium

Video as a teaching tool has been with us for some time now. Silent commercial films have been around since at least the late 1890s, and 16-mm projectors whirring behind black window shades were a stable classroom technology for a considerable portion of the twentieth century. In this century, it would appear that video has truly arrived as an educational technology, and while data projectors and computers capable of showing 'moving pictures' are still standard at all levels of education and training, educational moving pictures now find its widest audience now online.

Use of video for assessment is not quite so mainstream yet. Its use in this context has been traditionally been limited by factors such as set-up time and cost, requisite production and post production skills and concerns with regard to its reliability and management.

A significant number of assessment methods and learner tasks, however, can be plausibly argued for as giving rise to exactly the kind of learning evidence best captured as some kind of video artefact; such methods and tasks include the following (based on list provided in, Knight 2001, p. 4): Assessment of work-based learning; book, website or program reviews; Contribution to in class discussion; Defence of lab records; Exhibitions of work, posters, products; Objective Structured Clinical Examination (OSCE); Open-book, end of course exams; Orals and vivas; Peer assessment; Performances; Posters; Projects; 'Real' problem working; Role-playing; Self-assessment; Seminar presentations.

The "trick" in using video for assessment, the authors argue, is simply to make it demonstrably more reliable as well as affordable or manageable for assessors—in the sense of not placing too heavy a burden upon them in terms of their marking and feedback process. Part of the solution lies in the use of a very traditional tool for increasing reliability and consistency: rubrics.

Rubrics for Assessment

The advantages of rubrics in theory and practice are extensively enumerated elsewhere (see, e.g. Andrade 2000; Arter and McTighe 2001; Brookhart 2013) and will not again be detailed here except to note how they uniquely hold potential to increase and ensure greater inter- and intra-rater reliability and, when well implemented, to help provide fast but meaningful feedback to students

Despite, however, the pedagogical potential of assessment rubrics and the existence of a number of specific online and software-based solutions for developing and applying rubrics, in practice most implementations of rubrics appear to still be based on paper or on the use of generic spreadsheet software. In addition while some excellent repositories of rubrics exist (e.g. http://rubistar.4teachers.org and http://www.teach-nology.com/web_tools/rubrics/), typically these collections

are not curated or reviewed in a way that allows the "best" rubrics to rise to the top: such systems also typically only offer users the ability to print rubrics and do not offer any interactive tools or functionality.

The RedInk Project

What came to be known as the "RedInk" solution was conceived by the authors as a productivity tool or app for assessment and marking, one that would support the grading and marking of student work in a way that would assure efficiency, transparency of process and, significantly, marry often conflicting desires for good reliability *and* good validity as well as supporting both a summative and formative assessment function. From the start, both video and rubrics as described were seen as key aspects of the solution. Funding was provided by Enterprise Ireland, the government organisation responsible for the development and growth of Irish enterprises, under a special Commercialisation Fund for third level researchers.

The project began with an iterative process of ideation, research and user-centred design work which ended up producing, inter alia, a series of high fidelity interactive prototypes for the target system: these prototypes subsequently formed the

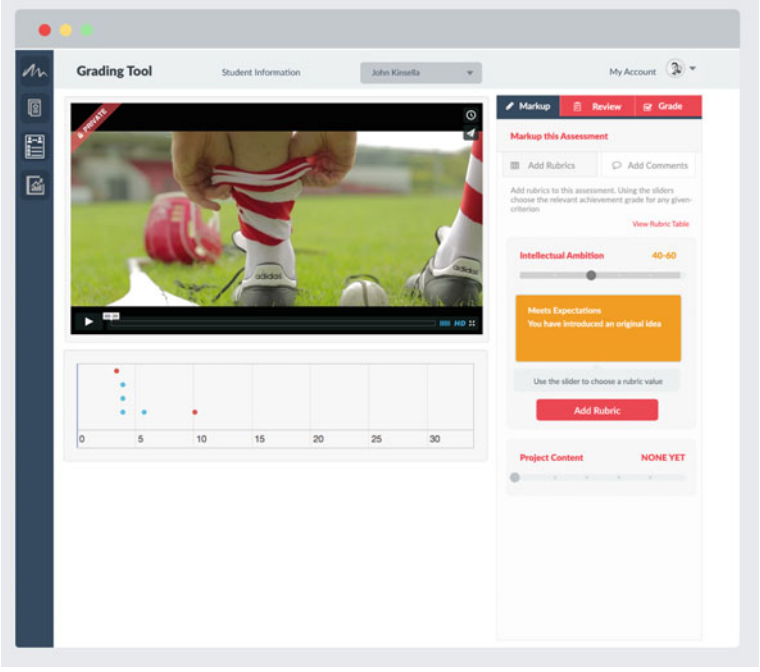


Fig. 1 The markup panel

basis for the software design and ultimately the software development. The software and requirement phase also determined some key architecture and technology aspects, incorporating back-end implementation with Java Spring/Hibernate over a relational databased (MySQL) and front-end development using bootstrap CSS framework AngularJS Javascript framework. Under this structure key functional modules were developed in keeping with the original proposal, with a final phase of work being devoted to testing the system and integrating the different modules together with a thorough revised and tested GUI. The solution, as described below, is an innovative SaaS productivity tool for marking and assessment, differentiated from competing products in its combination of extensive social sharing, handling of video submissions, and high granularity/detail with regard to the application of rubrics (Fig. 1).

The RedInk Solution—Some Key Features

Space does not allow a full account of the key features of the current or final RedInk system, but a number are worth elucidating in context of the requirement established in the first part of this paper for a means by which to support a move away from traditional exams and written coursework towards the use of video as a way to support a form of assessment which is, for many kinds of higher learning, more valid but which is also affordable and capable of marrying summative and formative functions. The solution can basically be described as having three primary modules or modes of functionality: the library, the rubric designer and the grading tool. These are described in detail below.

The Library

The library module is a space where users can evaluate, build and share rubrics. Based on the concept of crowdsourcing and reputation systems, the library governs the relative popularity of rubrics as a result of user activity and interaction in the system. The module provides filters and tags for peer-reviewed and rated rubric tables, all of which are contributed by the RedInk user base.

Rubric Designer

Although, as indicated, there are large quantities of rubrics available online, there is a notable lack of consistency in both form and content. The rubric designer aims to scaffold the rubric design process, giving rise to higher quality rubrics and making the process more interactive and user-friendly. When the rubric design process has

concluded, the rubrics can be shared with others in the rubric library and reused or repurposed for other assessments by the designer and by the RedInk community of users.

Grading Tool

RedInk's key features intersect in the grading tool module where rubrics are linked to video-based learning evidence. The grading process split into three distinct steps: markup, review and grade.

Using the markup panel, instructors can apply feedback to student work based on rubrics from the library module. Feedback is granular in nature, meaning rubric descriptors can be applied many times and to multiple segments of the assessment. The review panel displays all of the feedback provided or applied. The grade panel as well as offering cumulative qualitative feedback based on actions in the markup can also, significantly, perform a summative function by suggesting individual grades for each of the criteria, including final numeric marks if marks were included in the relevant rubric table.

The RedInk Solution—Current Status and Future Directions

Assessment truly dictates what our learners do and what they think learning is all about and, consequently, how they spend their time. Assessment regimes, however, tend, for various reasons, to be quite conservative and to rely conspicuously on just two strongly dominant options: summative written examinations and continuously assessed written work. One way to explain such conservatism is the emphasis that high stakes summative assessment brings with it on reliability and repeatability, an emphasis that gives rise to a certain simplification of assessment tasks and works against both assessment validity and formative function.

This paper has presented a proposal for a move away from text-based summative assessments towards formative video-based assessment. Video, it is argued, is a way of focussing in on process-oriented rather than terminal or sequential assessment and ultimately can incorporate viewing and reflection by all parties in the assessment process. The "trick" in using video for assessment, propose the authors, is simply to make it demonstrably more reliable as well as affordable or manageable for assessors—in the sense of not placing too heavy a burden upon them in terms of their marking and feedback workload. The solution as developed may be described as a fully functioning productivity tool for marking and assessment, differentiated from competing products in its combination of extensive social sharing, handling of video submissions, and high granularity/detail with regard to the application of rubrics.

The funding for the project out of which RedInk emerged ended in November 2014, but the two authors continue to work on the platform. Although a user-centred design process was core to the development of the solution and involved real users interacting from the very start with prototypes of increasing fidelity, the sample, as it were, was small and, moreover, did not involve the creation any substantial number of rubrics, or the marking and grading of authentic students submissions in any significant number. One of the ambitions of the authors now is to work towards a relatively large scale and ideally longitudinal trial of the software with real assessors and students to establish whether it could, in fact, form the basis for an assessment approach that overcomes some of the conflict inherent in desires for assessment to be both summative and formative, reliable and valid.

The general release of the rubric designer module has also been discussed as a way to populate the system with more rubrics and to leverage the "wisdom of the crowd" in identifying and creating better rubrics, as well as improving understanding of the characteristics of good rubrics. In a related way, work is ongoing, though still at an early stage, in developing an analytics and reporting module for the system. In addition to offering standard frequency distribution tables and, in time, a dashboard for more complex cross-tabulations and associated data visualisations, such a module, we envisage, will also offer what might be referred to as inter- and intra-rater reliability audits, in other words users could check their assessment choices against that of their colleagues or indeed against their own previous marking and grading outputs. In this way, we hope again to address concerns for the reliability of the kinds of assessment methods with which the RedInk system endeavours to challenge existing and dominant assessment regimes in higher education.

References

Andrade, H. G. (2000). Using rubrics to promote thinking and learning. *Educational Leadership, 57*(5), 13–19.

Arter, J., & McTighe, J. (2001). *Scoring rubrics in the classroom: Using performance criteria for assessing and improving student performance*. Corwin Press.

Biggs, J. B. (1987). *Student approaches to learning and studying. Research monograph.* ERIC.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in education, 5* (1), 7–74.

Breland, H. M., & Messick, S. (1999). From 2 to 3Rs: The expanding use of writing in admissions. *Assessment in Higher Education: Issues of Access, Quality, Student Development and Public Policy*, 91–111.

Brookhart, S. M. (2013). *How to create and use rubrics for formative assessment and grading*. ASCD.

Brown, G., Bull, J., & Pendlebury, M. (1997). *Assessing student learning in higher education*. London: Routledge.

Brown, S., & Knight, P. (1994). *Assessing learners in higher education.* Psychology Press.

Dunn, L., Morgan, C., O'Reilly, M., & Parry, S. (2003). *The student assessment handbook: New directions in traditional and online assessment*. London: Routledge.

Elton, L., & Johnston, B. (2002). *Assessment in universities: A critical review of research*. LTSN Generic Centre.
Knight, P. (2001). *A briefing on key concepts*. LTSN Generic Centre.
Linn, R. L. (2000). Assessments and accountability. *Educational Researcher, 29*(2), 4–16.
Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I—Outcome and process*. *British Journal of Educational Psychology, 46*(1), 4–11.
Ramsden, P. (2003). *Learning to teach in higher education* (2nd ed.). London: Routledge Falmer.
Rowntree, D. (1987). *Assessing students: How shall we know them?*. London: Taylor & Francis.

Using Technology Acceptance Model to Examine the Usage of Information and Communications Technology Among Nursing Students

Shu Ling Yeoh and Eng Hoe Wee

Abstract The introduction of information and communications technology (ICT) to the field of education has considerably changed the way the students learn. This study investigated the perceived usefulness (PU), perceived ease of use (PEOU), and perceived motivation (PM) to use ICT in learning. This survey applied the technology acceptance model (TAM) (Davis in MIS Q 13:319–340, 1989), which encompasses three dimensions of PU [8 items], PEOU [4 items], and PM [5 items]. Cluster sampling method was used, and all the 17 items surveyed were scored using 5-point Likert scale. Respondents consisted of 118 college nursing students (Female = 94.9%, Male = 5.1%, Mean age = 19.82 ± 1.73). Almost 60 and 50% of the respondents used ICT for assignment and learning, respectively. In terms of PU of technology, majority perceived that learning was made easier by using ICT. They perceived that ICT allowed them to learn and cover more material and communicating and working well with others. In terms of the ease of use of technology, the respondents perceived that it was easy to use, flexible to interact with, and easy to become skillful in using it. As for the motivation to use technology, majority of the respondents enjoyed using it as it is flexible and provided personal touch in gathering required information. *T*-test yielded nonsignificant results for all the three dimensions according to gender but significant results were obtained between 'occasionally' group (OG) and 'frequently' group (FG) using ICT for assignment and learning. Mean scores revealed that FG perceived ICT to be more useful, easier to use, and more motivated to use as compared to OG. The analysis of variance on the three dimensions showed insignificant results according

S.L. Yeoh (✉)
International Medical College, Kuala Lumpur, Malaysia
e-mail: yeohshuling@yahoo.ca

E.H. Wee
Faculty of Applied Sciences and Computing,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: weeeh@acd.tarc.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_4

to age group and semester. The integration of technology in learning has shown to be beneficial and should be encouraged, and research on its promotion and barriers of using it should continue to be scrutinized.

Keywords Ease of use of technology · Internet-based learning medium · Motivation to use technology · Technology acceptance model · Usefulness of technology

Introduction

The introduction of ICT into the field of education has considerably changed the way students learn. Numerous researchers have reported rampant usage of Internet-based information resources to complete assignments and searching for academic resources (Arumugam 2011; Ogedebe 2012; Tastan et al. 2011; Thang and Wong 2010). The Internet has also been seen as an important medium for proper higher education to greater heights as the world moves further into the knowledge economy (Yung et al. 2013). In addition, ICT has become an important component of quality-oriented education as it encourages students to obtain current and up-to-date information (Asdaque et al. 2010; Liu 2009; Ogedebe 2012). Despite the excellent potential of the Internet as a learning medium, its value will not be realized if students do not accept it for learning (Lee et al. 2005). Thus, there is a need to examine the students' acceptance of ICT in order to understand the various variables influencing acceptance.

The examination of nursing students' acceptance of ICT would be best understood through the application of technology acceptance model (TAM) which was initially developed by Davis in 1986. TAM provides a theoretical framework to explain, predict, and identify factors on internal beliefs, attitudes, and intentions of technology end user (Kowitlawakul 2008).

The use of technology by students for learning is influenced by numerous factors. Previous research has shown that the lack of use of technology for learning among students may be attributed to factors related to the individual user such as attitude and self-efficacy (Teo 2008; Tsai et al. 2010), complexity of technology (Teo 2009), and the environment such as facilitating conditions (Ngai et al. 2007).

In a study of student teachers, Teo et al. (2014) found that students with less experience in technology had a higher level of technology acceptance than those with more experience. Similarly, younger students accepted technology far more than the older students as younger users tend to react to technology more positively. Bennett and Maton (2010) attributed the age differentiation to continuous, pervasive exposure to modern technology among the younger users. Similarly, Yang et al. (2014) found similar trend in China where the older undergraduates used Internet for learning (28.7%) more than the younger students (14.1%).

Research Problem

Examination of supporting factors of using ICT to learn among nursing students has not been thoroughly conducted. This gap is worthy of researching as numerous researchers have reported the benefits of using ICT in the learning process. Ahmad and Love (2013) revealed that among the undergraduates of higher learning institutions, the factors found to affect the students' acceptance of technology were performance expectancy (usefulness), effort expectancy (ease of use), influence of lecturers, quality of services, and personal innovativeness. Tastan et al. (2011) found nursing students in Turkey perceived Internet to be a useful tool which can contribute positively to their nursing education. In addition, Shahi (2012) revealed first-year nursing students in Nepal enjoyed working with computers and perceived computers as a necessity to enhance their knowledge and helped developed their self-confidence. Hsu (2011) found that Taiwan nursing students' attitude was positive toward the course through e-learning. The respondents spent more time in learning and worked harder using computers, which allowed them to employ various learning strategies and mobilize various learning resources. Thus, it is imperative to examine students' acceptance of technology in the learning process.

Objectives of the Study

This study examined the usefulness, ease of use, and motivation to use ICT in learning among nursing students. Specifically, this study examined the perceptions of a sample of nursing students on the use of ICT to complete their assignment and learning.

Research Methodology

This survey applied the TAM (Davis 1989). The research instrument comprised of the 'acceptance of technology' dimensions of 'perceived usefulness' [8 items], 'ease of use' [4 items], and 'motivation' [5 items] with split-half reliability of 0.7536. Cluster sampling method was used, and all the 17 items surveyed were scored using 5-point Likert scale (from 1 = *strongly disagree*, 2 = *disagree*, 3 = *moderate*, 4 = *agree*, 5 = *strongly agree*). Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (*t*-test and ANOVA) according to gender, usage (occasionally and frequently), age group, and semester were used to investigate the nursing students' perception on the acceptance of technology in their academic life.

Likert scale questionnaire was used in this study because it is the most universal method for survey. Likert scales are easily understood, and the responses are easily quantifiable. Since it does not require the participant to provide a simple and concrete yes or no answer, it does not force the participant to take a stand on a particular item, but allows them to respond in a degree of agreement; this makes item answering easier on the respondent. When the items measure the same factor, they are grouped together and mean value could be determined for further analysis (Fisher 2004; Kumar 2012).

Results/Discussions

Descriptive statistics: Respondents consisted of 118 diploma-level nursing students (Female = 94.9%, Male = 5.1%, Mean age = 19.82 ± 1.73). Forty-four percentage of the respondents were below 20 years old, almost 51% were 20–22 years old, and 5% were above 23 years old. There were semester 1–5 students, with 75% of them from semester 1, 3, and 5. Majority (57.3%) of the respondents used ICT for assignment frequently, and 42.7% used occasionally. For learning, majority (51.8%) used occasionally and 48.2% used ICT frequently.

The total score for TAM ranged from 17 to 85, with scores toward 85 indicating a higher level of technology acceptance. The sample mean score for this study was 60.81, suggesting a high level of technology acceptance. The mean values of all items were above the midpoint of 3.00 and ranged from 3.06 to 4.05. The standard deviations ranged from 0.72 to 0.91, reflecting a fairly narrow spread of scores around the mean.

Data analysis in Table 1 showed respondents' perceived usefulness of technology. This dimension consisted of 8 statements, and the responses were based on a 5-point Likert scale. The total 'perceived usefulness of technology' scores ranged from 8 to 40, with scores toward 40 showing a higher level of perception of usefulness of technology. The mean for this dimension was 28.55 (SD = 3.25), indicating accepting technology as useful for learning. However, the high standard deviation values showed high variability in scores, and this might be affected by extreme scores. Furthermore, almost 76% of the respondents 'agreed and strongly agreed' that learning was made easier by using ICT. They perceived that ICT was a useful tool which allowed them to learn and cover more materials, and communicating and working well with others.

Alshare and Lane (2011) demonstrated in their study that the respondents perceived the Internet to be an effective means which contributes to the increase of their academic performance. Similarly, Davis (1989) stressed that people tend to use or not use an application to the extent that they believe it will help them to perform better.

Table 1 Respondents' perceived usefulness of technology

Statement	Frequency (%)					Mean	SD
	SD	D	N	A	SA		
Learning is made easier by using ICT	0(0.0)	2(1.7)	26(22.0)	54(45.8)	36(30.5)	4.05	0.772
ICT does not make me a more effective learner	18(15.3)	41(34.7)	47(39.8)	10(8.5)	2(1.7)	3.53	0.912
I can learn and cover material more quickly through the use of ICT	1(0.8)	6(5.1)	39(33.1)	55(46.6)	17(14.4)	3.69	0.813
My learning performance is generally the same with ICT	4(3.4)	24(20.3)	68(57.6)	19(16.1)	3(2.5)	3.06	0.777
I use ICT because it gives me control over things I want to do in my studies	1(0.8)	21(17.8)	46(39.0)	46(39.0)	4(3.4)	3.26	0.821
ICT allows me to produce more in the time I have	1(0.8)	13(11.0)	54(45.8)	44(37.3)	6(5.1)	3.35	0.778
ICT is useful as a learning tool	0(0.0)	2(1.7)	32(27.1)	56(47.5)	28(23.7)	3.93	0.759
I use ICT because it allow me to communicate and work with others doing the same course as me	2(1.7)	10(8.5)	36(30.5)	46(39.0)	24(20.3)	3.68	0.951

Note: *SD* Strongly disagree, *D* Disagree, *N* Neutral, *A* Agree, *SA* Strongly agree

Table 2 reported respondents' perceived ease of use of technology. This 'perceived ease of use of technology' dimension consisted of 4 statements, and responses were based on a 5-point Likert scale. The total 'perceived ease of use of technology' scores ranged from 4 to 20, with 20 showing a higher level of perception on the ease of use for technology. The sample mean score of this dimension was 13.83 (SD = 2.12), showing a slight perceived ease of use of technology. However, the high standard deviation values showed high variability in scores. In addition, almost 65% of the respondents perceived that it was not difficult to use ICT. Between 38 and 43% perceived ICT (A and SA) was flexible to interact with and easy to become skillful in using it.

Table 2 Respondents' perceived ease of use for technology

Statement	Frequency (%)					Mean	SD
	SD	D	N	A	SA		
I find ICT difficult to learn to use on my course	18(15.3)	58(49.5)	29(24.6)	11(9.3)	2(1.7)	3.67	0.906
ICT is generally easy to use on my course	1(0.8)	8(6.8)	58(49.2)	40(39.0)	5(4.2)	3.39	0.717
I find it easy to become skillful in using ICT on my course	1(0.8)	9(7.6)	63(53.4)	40(33.9)	5(4.2)	3.33	0.717
I find ICT flexible to interact with on my course	0(0.0)	5(4.2)	63(53.4)	43(36.4)	7(5.9)	3.44	0.674

Note: *SD* Strongly disagree, *D* Disagree, *N* Neutral, *A* Agree, *SA* Strongly agree

The results on the slight ease of use of ICT may be explained by Alshare and Lane (2011) that about 20% of the respondents of their studies needed additional training either for accessing resources or technical training. To become skillful, students must use ICT continuously until it formed a 'habit' within the students (Limayem and Cheung 2011). According to Davis (1989), people tend to use or not use an application to the extent that they believe it will help them to perform better, although the ease of use is a factor, they might still use it if the benefits outweigh the difficulty level. However, Edmunds et al. (2012) found in comparing students' ICT skills that those who scored higher in ICT at work were using more ICT. On the other hand, Wu et al. (2008) revealed that the acceptance of technology depended on the ease of use of a designed information system.

The analysis of the 'acceptance of technology based on motivation' [motivation] items was reported in Table 3. This dimension consisted of 5 statements, and the responses were based on a 5-point Likert scale. The total 'motivation' scores ranged from 5 to 25, with scores toward 25 showing a higher level of acceptance of technology. The mean score for 'motivation' dimension was 18.42 (SD = 2.64), showing slight perceived acceptance of technology based on motivation. However, the high standard deviation values showed high variability in scores. The data also revealed that 91% of the respondents 'agree' and 'strongly agree' that ICT allowed them to learn wherever they need to. They perceived that apart from being enjoyable to use while studying, ICT provided personal touch and allowed gathering of information required for variety of subjects learned.

The perceived feeling of personal touch may be explained by the hands-on experience that promoted students' satisfaction when using the Internet (Alshare and Lane 2011). In addition, Limayem and Cheung (2011) revealed in their study that the continued usage of the Internet formed a 'habit' within the students and helped them learned at their own pace. Further, ICT provided opportunities to

Table 3 Respondents' acceptance of technology based on motivation

Statement	Frequency (%)					Mean	SD
	SD	D	N	A	SA		
I use ICT because it allows me to learn wherever I need to	0(0.0)	3(2.5)	24(20.3)	61(51.7)	30(25.4)	4.00	0.751
I use ICT because it allows me to have all the information I need for my studies in different subjects	0(0.0)	6(5.1)	32(27.1)	59(50.0)	21(17.8)	3.81	0.782
I use ICT because it makes study activities more personal	2(1.7)	9(7.6)	47(39.8)	42(35.6)	18(15.3)	3.55	0.902
I use ICT because it is enjoyable to use while studying	1(0.8)	11(9.3)	33(28.0)	53(44.9)	20(16.9)	3.68	0.895
I find it difficult to control ICT and make it do what I want on my course	9(7.6)	47(39.8)	46(39.0)	13(11.0)	3(2.5)	3.39	0.877

Note: *SD* Strongly disagree, *D* Disagree, *N* Neutral, *A* Agree, *SA* Strongly agree

students in obtaining current and up-to-date information, as well as to gather and utilize the information they needed (Liu 2009). Students tended to use more ICT when they felt motivated (Edmunds et al. 2012; Roca and Gagne 2008).

Inferential statistics: *T*-test yielded nonsignificant results for all the three dimensions (PU, PEOU, and PM) according to gender, but significant results were obtained when groups 'occasionally' (OG) and 'frequently' (FG) used ICT for doing assignment (usefulness: $t(115) = -3.053$, $p < 0.05$; ease of use: $t(115) = -4.393$, $p < 0.05$; motivation: $t(115) = -3.654$, $p < 0.05$) and learning (usefulness: $t(112) = -3.658$, $p < 0.05$; ease of use: $t(112) = -2.240$, $p < 0.05$; motivation: $t(112) = -4.683$, $p < 0.05$) were compared. In terms of using ICT to complete assignments, the mean scores revealed that the FG perceived ICT to be more useful, more ease of use, and more motivated to use ICT as compared to the OG. Similar results were obtained for using ICT for learning in the three dimensions. The analysis of variance on the three dimensions showed insignificant results according to age group and semester.

The insignificant results of usefulness and ease of ICT used according to gender in this study was similar to the findings of Arumugam (2011) among Malaysian undergraduates. However, the imbalance percentages of male and female respondents might affect the results of this study (Female = 94.9%, Male = 5.1%) as Wu and Yeh (2012) reported in a study of 443 students (male = 51.47%, female = 48.53%) that a significantly higher confidence in competency in male than female

students, although the female students scored higher in terms of frequency of usage and perceived importance of using electronic materials from the library. However, previous research suggests that individuals' expectations of ICT use might be different because of gender, age, and experience. Researchers supported the notion that effort expectancy strongly affected the intention of using ICT for women (Venkatesh and Morris 2000; Venkatesh et al. 2000, 2003), particularly those who are older (Morris and Venkatesh 2000) and who have little experience with ICT (Venkatesh et al. 2003).

The acceptance of technology among nursing students in this study might be explained by the concept of performance and effort expectancy. Previous researchers (Wang et al. 2009; Chong et al. 2011) found that performance expectancy influenced the intention to use ICT. Students with high performance expectancy believed that using ICT was beneficial to their studies, thus accepted ICT more than students with lower performance expectancies. Similarly, effort expectancy was also proven to have significant influence on student intention to use ICT (Wang et al. 2009; Chong et al. 2011; Liu et al. 2010). Students were willing to accept ICT if the system and applications were easy to use, and they would not need much instruction on how to use it.

In terms of motivation, Venkatesh et al. (2002) emphasized that both extrinsic and intrinsic motivations are predictors of behavioral intention to use ICT. Motivation involves the internal processes that give behavior of its energy and direction.

Contributions of the Study

Even though the literature has shown that studies had been conducted overseas and in Malaysia (e.g., Ahmad and Love 2013; Guan et al. 2012; Shahi 2012; Wong et al. 2013), apparently there was no research conducted using TAM among Malaysian nursing students. This research finding would provide some preliminary data for future research on the acceptance of technology in learning among nursing students.

Conclusions

It is hoped that this study has contributed to the ensuing debates on technology acceptance in education and offered additional insights into the use of ICT among nursing students. The results of this study revealed high-level acceptance of ICT for learning. In addition, the respondents' perceived ICT as useful, and they were motivated to use ICT in learning. However, the results showed only slight perceived ease of ICT usage, and 45% (mean score) of the respondents scored 'neutral' scale

for the 'ease of use' dimension. Thus, further study should focus on the limitation and technical difficulties that the students might face. Further assessment on the impact of Internet on students' learning performance would be useful.

References

Ahmad, A., & Love, S. (2013). Factors influencing students' acceptance of m-learning: An investigation in higher education. *International Review of Research in Open and Distributed Learning, 14*(5), 82–107.

Alshare, K. A., & Lane, P. L. (2011). Predicting student-perceived learning outcomes and satisfaction in ERP courses: An empirical investigation. *Communications of the Association for Information Systems, 28*(34), 571–584.

Arumugam, R. (2011). The usage of technology among education students in University Utara Malaysia: An application of extended Technology Acceptance Model. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 7* (3), 4–17.

Asdaque, M. M., Nasir Khan, M., & Abbas Rizvi, S. A. (2010, December). Effect of internet on the academic performance and social life of university students in Pakistan. *Journal of Education and Sociology*, 21–27.

Bennett, S. J., & Maton, K. (2010). Beyond the 'digital natives' debate: Towards a more nuanced understanding of students' technology experiences. *Journal of Computer Assisted Learning, 26* (5), 321–331.

Chong, J., Chong, A. Y., Ooi, K., & Lin, B. (2011). An empirical analysis of the adoption of m-learning in Malaysia. *International Journal of Mobile Communication, 9*(1), 1–18.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

Edmunds, R., Thorpe, M., & Conole, G. (2012). Student attitudes towards and use of ICT in course study, work and social activity: A technology acceptance model approach. *British Journal of Educational Technology, 43*(1), 71–84.

Fisher, W. P., Jr. (2004). Meaning and method in the social sciences. *Human Studies: A Journal of Philosophy and the Social Sciences, 27*(4), 429–454.

Guan, N. G., Mohammed Isa, S., Hashim, A. H., Kumar Pillai, S., & Harbajan Singh, M. K. (2012). Validity of the Malay version of the internet addiction test: A study on a group of medical students in Malaysia. *Asia-Pacific Journal of Public Health*. doi:10.1177/1010539512447808

Hsu, L. L. (2011). Blended learning in ethics education: A survey of nursing students. *Nursing Ethics, 18*(3), 418–430.

Kumar, R. (2012). *Research methodology: A step-by-step guide for beginners*. London: Sage Publications.

Kowitlawakul, Y. (2008). Technology acceptance model: Predicting nurses' acceptance of telemedicine technology (eICU®). Ph.D., Fairfax, VA: George Mason University.

Lee, M. K. O., Cheung, C. M. K., & Chen, Z. (2005). Acceptance of Internet-based learning medium: The role of extrinsic and intrinsic motivation. *Information & Management, 42*(8), 1095–1104.

Limayem, M., & Cheung, M. K. (2011). Predicting the continued use of Internet-based Scholar learning technologies: The role of habit. *Behaviour and Information Technology, 30*(1), 91–99.

Liu, S. C. (2009). Study on information literacy instruction for postgraduates in medical schools. *Journal of the Chinese Medical Association, 29,* 105–107.

Liu, Y., Li, H., & Carlsson, C. (2010). Factors driving the adoption of m-learning: An empirical study. *Computers & Education, 55*(3), 1211–1219.

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing workforce. *Personnel Psychology, 53*(2), 375–403.

Ngai, E. W. T., Poon, J. K. L., & Chan, Y. H. C. (2007). Empirical examination of the adoption of WebCT using TAM. *Computers & Education, 48*(2), 250–267.

Ogedebe, P. M. (2012). Internet usage and students' academic performance in Nigeria Tertiary Institutions: A case study of University of Maiduguri. *Academic Research International, 2*(3), 334–343.

Roca, J. C., & Gagne, M. (2008). Understanding e-learning continuance intention in the workplace: A self-determination theory perspective. *Computers in Human Behavior, 24,* 1585–1604.

Shahi, M. (2012). Knowledge, attitude and application of computer by Bachelor Level Nursing students. *Journal of Institute of Medicine, 34*(20), 21–27.

Tastan, S., Tastan, B., Iyigun, E., & Ayhan, H. (2011). Nursing students' perception of the internet in Turkey: A questionnaire survey. *Health MED, 5*(6), 1636–1642.

Thang, S. M., & Wong, S. L. (2010). Impact of ICT on teaching and learning in Asia: Focusing on emerging trends, patterns and practice. *International Journal of Education and Development using Information and Communication Technology, 6*(3), 3–6.

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology, 24*(4), 413–424.

Teo, T. (2009). Modelling technology acceptance in education: A study of pre-service teachers. *Computers & Education, 52*(1), 302–312.

Teo, T., Khlaisang, J., Thammetar, T., Ruangrit, N., Satiman, A., & Sunphakitjumnong, K. (2014). A survey of pre-service teachers' acceptance of technology in Thailand. *Asia Pacific Education Review, 15,* 609–616.

Tsai, P. S., Tsai, C. C., & Hwang, G. H. (2010). Elementary school students' attitudes and self-efficacy of using PDAs in a ubiquitous learning context. *Australasian Journal of Educational Technology, 26*(3), 297–308.

Venkatesh, V., & Morris, M. G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly, 24* (1), 115–139.

Venkatesh, V., Morris, M. G., & Ackerman, P. L. (2000). A longitudinal field investigation of gender differences in individual technology adoption decision making processes. *Organizational Behavior and Human Decision Processes, 83*(1), 33–60.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Venkatesh, V., Speier, C., & Morris, M. G. (2002). User acceptance enablers in individual decision making about technology: Toward an integrated model. *Decision Sciences, 33*(2), 297–316.

Wang, Y., Wu, M., & Wang, H. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology, 40*(1), 92–118.

Wong, C. H., Shannon, D. M., & Ross, M. E. (2013). Students' characteristics, self-regulated learning, technology self-efficacy, and course outcome in online learning. *Distant Education, 34*(3), 302–323. doi:10.1080/01587919.2013.835779

Wu, M. D., & Yeh, S. T. (2012). Effects of undergraduate student computer competence on usage of library electronic collections. *Journal of Library and Information Studies, 10*(1), 1–17.

Wu, Y., Tao, Y., & Yang, P. (2008). The use of unified theory of acceptance and use of technology to confer the behavioral model of 3G mobile telecommunication users. *Journal of Statistics & Management Systems, 11*(5), 919–949.

Yang, H., Chen, Y., Zheng, L., Xu, X., & Cao, X. (2014). Analysis of internet use behaviors among clinical medical students in China. *BMC Medical Education, 14,* 67.

Yung, C. S., Fadhilah, M. Y., & Wan Hussain, W. I. (2013, June 25–27). *Internet usage among undergraduate student in Malaysia*. Paper presented at Rural ICT Development (RICTD) International Conference, Melaka, Malaysia. Melaka, Malaysia: RICTD International Conference.

Awareness of Safe and Responsible Use of ICT Among Students in a Malaysian University

Pek Hoon Er, Phaik Kin Cheah, Priscilla Moses, Chee Keong Chong and Ban Hock Ang

Abstract In Malaysia, in 2013, the DigiCyberSAFE in Schools programme administered a survey on 9651 students aged 7–18 (primary and secondary school students) on their levels of awareness and understanding of cybersafety issues, appropriate online behaviour and ability to safeguard themselves against risks. The current study was conducted on students in a private university, aged between 19 and 24 years. The objective was to determine the level of awareness of cybersafety issues and their ability to safeguard themselves against risks. Both qualitative and quantitative research methods were used. A survey questionnaire was used to determine their awareness and understanding of cyber-safety issues and the ability to safeguard against risks. Focus group interview was used to examine students' perceptions and experiences of risky online activities. The findings show: (i) students feel somewhat safe when they were on the internet. (ii) They have a good understanding of what constitutes risky online activities. (iii) The students also

P.H. Er
Faculty of Accountancy and Management,
Universiti Tunku Abdul Rahman, Kampar, Malaysia
e-mail: erph@utar.edu.my

P.K. Cheah
Faculty of Arts and Social Sciences,
Universiti Tunku Abdul Rahman, Kampar, Malaysia
e-mail: cheahpk@utar.edu.my

P. Moses · B.H. Ang (✉)
Faculty of Creative Industries,
Universiti Tunku Abdul Rahman, Kampar, Malaysia
e-mail: angbh@utar.edu.my

P. Moses
e-mail: priscilla@utar.edu.my

C.K. Chong
Faculty of Business and Finance,
Universiti Tunku Abdul Rahman, Kampar, Malaysia
e-mail: chongck@utar.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_5

know how to protect themselves while using the internet. (iv) Despite this, they still recognise the importance of learning about internet safety. This research is part of on-going series of cross-country researches that aim to identify the level of awareness of safe and responsible use of ICT among Asia-Pacific digital natives.

Keywords Cybersafety · ICT · Internet · Online risks · Safe and responsible use · University students

Introduction

Information and Communication Technology (ICT) has experienced an exponential growth in the past decades. With the cover of anonymity, comes an array of social and ethical issues. Numerous concerns have been raised worldwide, particularly pertaining to online safety and security and misuse of information (UNESCO Bangkok 2015). Children and "digital natives" (i.e. youths aged 15–24 years old), are particularly vulnerable. In Malaysia, there are 21 million Internet users today, with digital natives forming the bulk of these users (CyberSecurity Malaysia).

The CyberSAFE in Schools programme was launched in 2010 by CyberSecurity Malaysia and the Ministry of Education to implement cyber-safety projects focusing on the education sector. DiGi Telecommunications Sdn Bhd (DiGi) subsequently launched the DigiCyberSAFE in Schools programme. Few academic researches on cyber-security awareness focused on youngsters and on the issue of safeguarding personal information, according to a survey by Abd Rahim et al. (2015). Of particular relevance to the present study are two (2) researches conducted by DiGi Telecommunications Sdn Bhd Malaysia (DiGi) in 2013 and 2014.

In the 2013 research, the "*Safety Net—Growing Awareness Among Malaysian School Children on Staying Safe Online*" Survey was administered among 9651 students comprising primary and secondary students (students aged 7–18). The survey was on their levels of awareness and understanding of cyber-safety issues, appropriate online behaviour, ability to safeguard themselves against risks and the impact of the awareness workshops.

The survey was complemented by another survey, "*Safety Net: Capacity Building Among Malaysian Schoolchildren on Staying Safe Online*" (DiGi 2014), which was responded to by approximately 14,000 schoolchildren nationwide. Among the main findings of the 2014 DiGi Survey Report:

- 83% of schoolchildren were vulnerable to online risks due to minimal protective actions taken;
- Two-thirds of younger schoolchildren, below 13 years old took very low protective steps towards online safety.
- Yet, 52% of these schoolchildren still believed that they were safe online;
- An average 70% of schoolchildren were not concerned with the invasion of their privacy or the anonymity of the person they interact with.

Research Problem

There are very few academic researches on cyber-security awareness that focused on digital natives, which form the crop of University students in Malaysia today. There has been a call for more active research on digital citizenship in developing countries, in order to produce research findings that could guide policy-makers in working out intervention programmes that are appropriate for each country's needs (UNESCO Bangkok 2015).

The current study seeks to add to the body of literature by providing a preliminary data on university students aged 19–24. The research questions for the current study:

(1) To what extent are students aware of online safety and protection?
(2) What are the indicators of online safety trends whenever the students go online?
(3) What are the main personal concerns of students about internet use?

Objective of the Study

The objective of the current study is to investigate the awareness of safe and responsible use of ICT among higher education students in Malaysia. The research seeks to examine two (2) dimensions of internet-related behaviours among university students:

(1) Students' awareness and practices related to online safety and protection and indicators of online safety trends whenever the students go online;
(2) Students' personal concerns about internet use.

Research Methodology

The current study was conducted on 103 students of a local private university in Malaysia, aged from 19 to 24. Both qualitative and quantitative research methods were used. Survey questionnaire was used to examine two (2) dimensions of internet-related behaviours among university students. Focus group interview was used to examine students' perceptions and experiences of risky online activities.

Results/Discussion

A total of 103 responses were collected. There were more female respondents (67.3%) compared to male respondents (32.7%). The respondents were divided into five large groups: (1) Science/Engineering/Information Technology/Mathematics, (2) Arts/Social Science, (3) Business/Management/Accounting, (4) Medical/Nursing/Physiotheraphy and (5) Others. Students taking Business, Management or Accounting course formed the most respondents, followed by students of Science/Engineering/IT/Mathematics (Fig. 1).

It was found that majority of the respondents stay with their housemates in a rented accommodation. Since the University's two campuses were located in Selangor and Perak, students from other states would invariably be staying in rented accommodations (Fig. 2).

Besides, 99% of the respondents have a computer with internet access at their place of residence. Majority of the respondents spend around 8–22 h on the internet in a typical week (Fig. 3).

Fig. 1 Courses taken by the respondents

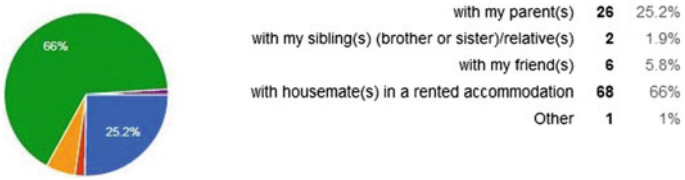


Fig. 2 With whom the respondents stayed

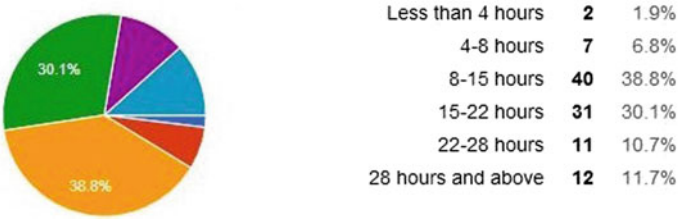


Fig. 3 Hours spent online

The respondents primarily used smart phones, notebook and mobile phones when connecting to the internet. The respondents also largely access the internet from home and campus. As for the types of online activities which students usually carry out, the respondents mostly access social networking sites and researched for schoolwork, which would mean their university assignments and other coursework (Figs. 4 and 5).

The respondents largely felt safe when they were on the internet and they responded that they knew how to protect themselves while using the internet (Fig. 2). Despite this, 85% of the respondents agreed that it was still important for them to learn about internet safety.

When asked what actions were taken to protect themselves on the Internet, the bulk of the respondents mentioned that they take a few actions to protect themselves on the internet. This includes, among others, setting their privacy settings, not share too much information about themselves and not revealing personal information. The majority of the respondents share their passwords with no one else. Those who share their passwords largely pick close family members. No respondent had shared their passwords with lecturers, spouse, and others. Close friends were preferred compared to roommate/housemates, while boyfriend/girlfriend was preferred over close friends (Table 1).

It was further observed that respondents usually use 2–3 passwords, while others use unique/different passwords for some accounts, while other accounts have

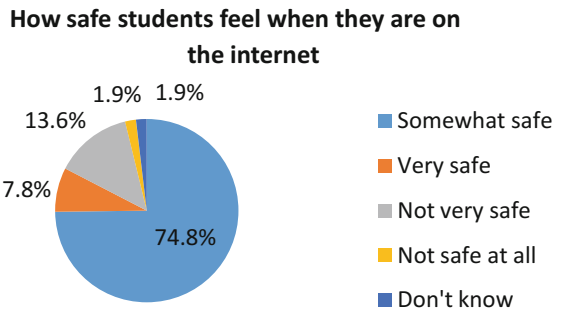


Fig. 4 How safe the respondents feel when on the internet

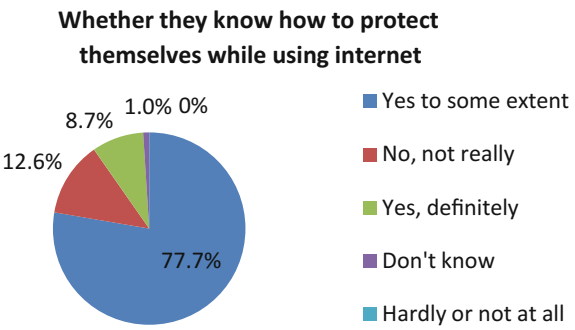


Fig. 5 Whether they know how to protect themselves while using internet

Table 1 Whether the respondents have shared their passwords with anyone

Shared with no one	56.3%
Family members	26.2%
Parents	15.5%
Boyfriend/girlfriend	13.6%
Close friend	6.8%
Roommate/housemate	3.9%
Lecturers	0%
Spouse	0%
Others	0%

common/shared passwords. No respondent replied that he/she uses the same password for all accounts.

Most respondents change their passwords only when they had forgotten the original passwords. Only 11.7% of the respondents would change their passwords every year and 4.9% of the respondents would change the passwords every few months. Regarding passwords, the respondents mostly use those of at least 8-characters long, and/or have a mix of numbers, "upper" and "lower" case letters. Less than 4% replied that they use just one type of passwords (all alphabet letters only or all numbers only or all symbols only). This shows that generally, students know the requirements for creating strong passwords.

The respondents largely feel that the privacy setting on their social networking account was set to keep them protected from strangers. They were also largely confident about the security of the devices (e.g. phone, tablet) that they use. A majority of them stated that they make it a habit to turn off their Bluetooth or WIFI when the device was not in use.

When asked questions pertaining to the nature of computers at their place of residence and whether there were any forms of ***parental controls or other rules*** pertaining to the use of computers, majority of the respondents replied that the computer in their place of residence can be moved around as opposed to being kept in a common area or out in the open. Most of the computers used by the respondents at their place of residence do not have any "parental controls" which filter/restrict/limit the type of websites that they can visit. Lack of parental controls can be due to the fact that students mostly stay at rented accommodations where there were virtually no rules or restrictions imposed. Meanwhile, even where students stay with parents, lack of parental controls is also observed. Generally, at their place of residence, there were no rules for using the internet, and where there were rules, it would seem that these rules seek to safeguard the students from external threats. Hence, generally, the students were allowed a great deal of freedom to use the internet.

Regarding students' personal concerns about internet use, the respondents were asked about what matters that worry or concern them the most about using the internet. Table 2 shows the findings.

It was observed that the respondents were more concerned about becoming addicted or hooked to the internet than invasion of privacy. They were also

Table 2 Respondents' personal concerns about internet use

Becoming addicted or hooked to the internet	92.2%
Invasion of their privacy	85.4%
Work not being done because spending too much time on the internet	85.4%
Anonymity, i.e. not knowing who is on the other end	81.6%
Bullying on the internet	76.7%
Not interacting or mixing with people face to face	58.3%
Not living in the real world	35%
Others	35.9%
No worries or concerns at all	1%

concerned about work not being done because spending too much time on the internet. Meanwhile, unlike schoolchildren surveyed earlier (DiGi 2014), the university students here are concerned with the anonymity of the internet.

In the next stage of the research, focus group interview was used to examine students' perceptions and experiences of risky online activities. The interview was conducted with a group of six (6) Accounting students. Three (3) were males while the other three (3) were females. Four (4) students stay in rented accommodation.

Two (2) major categories of issues were identified:

(a) Understanding on what constitute risky online activities: It was found that generally, the respondents have a good understanding of what constitutes risky online activities. They were able to mention that they should safeguard personal information whenever going online. They also stated that they never share their passwords with anyone. They stated that they feel safe when they were on the internet.
(b) Awareness of steps needed to protect themselves on the internet: Generally, the respondents were aware of the steps needed to protect themselves on the internet. However, when it comes to passwords, they never change their passwords. They do have same or common passwords for emails and social media accounts. When it comes to online banking accounts, although the password would be different than that used for emails/social media accounts, they will still use the same password for the different banking accounts. As one interviewee said: "*Don't have too many passwords for many accounts…hard to remember…*".

Contributions of the Study

The present study shows that the students feel somewhat safe when they were on the internet. They have a good understanding of what constitutes risky online activities. The students also know how to protect themselves while using the internet. Despite this, they still recognise the importance of learning about internet safety.

The limitation of this study is that convenient sampling was administered as this study is exploratory in nature, in order to provide an indication of the scenario among undergraduates in a Malaysian University. Hence the findings from this study may not reflect the population but provides an indication as to the issues faced in Malaysia. This study is significant in providing preliminary insights on the awareness of safe and responsible use of ICT among university students in Malaysia. It was mentioned in the Malaysian Education Blueprint 2015–2025 (Higher Education): "Malaysia needs to move from a mass production delivery model to one where technology-enabled innovations were harnessed to democratise access to education and offer more personalised learning experiences to all students." Globalised online learning environment is here to stay, and there is thus a need to ensure that our students stay safe online.

Conclusions

This research is part of on-going series of cross-country researches that aim to identify the level of awareness of safe and responsible use of ICT among Asia-Pacific digital natives. It is aspired that the findings presented in the study and other upcoming studies to be conducted on a larger student population in Malaysia can help identify the gaps between policy and practice that would need to be addressed or further enhanced by policy-makers.

Acknowledgements The authors express appreciation for the support of the sponsors, UNESCO. [Research grant number 4452/000].

References

Abd Rahim, N. H., Hamid, S., Mat Kiah, L., Shamshirband, S., & Furnell, S. (2015). A systematic review of approaches to assessing cybersecurity awareness. *Kybernetes, 44*(4), 606–622.

DiGi. (2013). *Safety net—Growing awareness among Malaysian school children on staying safe online.* Retrieved October 16, 2015 from: https://digi.cybersafe.my/files/article/DiGi_Survey_Booklet_COMPLETE.pdf

DiGi. (2014). S*afety net: Capacity building among Malaysian schoolchildren on staying safe online*. Retrieved October 16, 2015 from: https://digi.cybersafe.my/files/article/CyberSAFE_Survey_Report_2014.pdf

UNESCO Bangkok. (2015). *Fostering digital citizenship through safe and responsible use of ICT —A review of current status in Asia and the Pacific as of December 2014*. Thailand: UNESCO Bangkok Asia and Pacific Regional Bureau for Education.

Initial Considerations for Transnational Education Providers Regarding the Mapping of the East African Qualifications Framework to the European Qualifications Framework

Ciarán O'Leary

Abstract The East African Qualifications Framework for Higher Education (EAQFHE) is the latest in a number of regional frameworks of qualifications that have been developed this century. As with other regional frameworks, such as the Qualifications Framework for the European Higher Education Area (QF-EHEA) which emerged from the Bologna process, and the European Qualifications Framework for Lifelong Learning (EQF), the key objective of the EAQFHE is to enable mobility and harmonisation among the various jurisdictions which it covers. Mapping exercises between local and regional qualifications frameworks enable providers and stakeholders in different jurisdictions to engage in a process where they examine the type and level of awards made in those jurisdictions, with a particular focus on the compatibility and alignment of awards. This paper looks at the specific case of transnational education (the provision of education across borders) and argues for the need to incorporate additional considerations into any such mapping exercise. These considerations must account for the local linguistic and cultural expectations attached to awards, such that providers in different jurisdictions have an explicit understanding of what would otherwise be an implicit and perhaps inconsistent understanding of the nature and type of a particular award. This paper makes specific recommendations relating to transnational education involving the European and East African regions ahead of any formal mapping exercise between the EAQFHE and the corresponding European frameworks of qualifications, the QF-EHEA and the EQF.

Keywords International education · Quality assurance · Transnational education

C. O'Leary (✉)
Dublin Institute of Technology, Dublin 8, Ireland
e-mail: ciaran.oleary@dit.ie

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_6

Introduction

The mapping of qualifications frameworks enables a shared understanding of qualifications and the achievement of learning across boundaries. Regional qualifications frameworks such as the Qualifications Framework for the European Higher Education Area (QF-EHEA) and the European Qualifications Framework for Lifelong Learning (EQF) have been developed in recent years through an analysis of qualifications in multiple jurisdictions in Europe and an agreement regarding the types of learning that should be recognised with qualifications at given levels. Mapping the EQF/QF-EHEA to frameworks for other regions enables a shared understanding of qualifications involving Europe and the jurisdiction covered by the corresponding framework.

In this paper, we make recommendations regarding the potential mapping between regional frameworks of qualifications in Europe (QF-EHEA and EQF) and the newly developed East African Qualifications Framework for Higher Education (EAQFHE). These recommendations include the need to highlight explicitly the language skills and cultural expectations associated with a qualification. While these are usually implicitly associated with an award due to the associated learning having taken place in a given environment, this paper considers the specific case of transnational education where a qualification aligned to a framework of qualifications designed for one jurisdiction is awarded for learning which has taken place in a different jurisdiction. This raises questions which should be answered as part of any mapping exercise for qualifications frameworks from linguistically and culturally diverse regions, such as a potential future mapping between the EQF/QF-EHEA and the EAQFHE.

Transnational Education

Transnational education is an approach to the international delivery of education whereby the students working towards a qualification are doing so in a country (the host country) other than the home country of the education provider (home institution) (EAQAHE 2010; Francois et al. 2016). Popular approaches include *programme franchises* (whereby a university in the host country delivers a programme on behalf of the home institution) and *branch campuses* (whereby the home institution establishes a formal presence in the host country). A third popular approach enabled largely through the use of digital technology is *distance learning* (whereby the programme is delivered online to students in multiple countries). Transnational education is popular due to the potential to attract larger numbers to the home institutions register but it is not without its challenges.

The primary challenge for transnational providers relates to quality assurance and the requirement in all cases that *quality assurance must travel* (Knight 2007; UNESCO/OECD 2005). This axiom of transnational delivery requires that the

quality of the education received by students in all countries must be assured to be equivalent. Many of the greatest failures of transnational education have been due to an inability of the home institution or its accrediting/regulating body to assure the quality of the programme to the standard required.

Qualifications Frameworks

Qualifications Frameworks have been established in many countries internationally to provide a nationally agreed structure within which qualifications are awarded to formal and informal learners. Typically, such frameworks use numbers to designate levels of increasing complexity at which learning can be formally accredited by bodies enabled through legislation to award qualifications. Each level is usually described using a set of descriptors or level indicators which use learning outcomes to identify the level of learning that must have been achieved by a learner in order to become eligible for a qualification at that level in a specific domain.

The power of qualifications frameworks is due to their capacity to serve as a communication device which enables a shared understanding of learning and qualifications among all stakeholders in the learning process—including the state and its citizens, employers, universities and the learner themselves. Through qualifications frameworks, learners are enabled to identify their own level of learning acquired either formally or informally in a specific discipline. Equipped with knowledge of their positioning they can then seek either recognition for their learning through a process of recognition of prior experiential learning, or entry to a programme of learning which will provide them with an opportunity to advance to the next level. In this regard, qualifications frameworks are seen as powerful enablers for creating a learner-centred culture of lifelong learning in a national context.

Equally importantly, qualifications frameworks serve as a foundation stone upon which national and institutional academic quality assurance systems are built. They enable institutions and accrediting bodies to share an understanding of the level of learning that ought to have been achieved by learners at a particular level, which drives all processes in higher education including recruitment and admission, assessment and feedback, external examination, student transfer and ultimately the making of awards.

International Qualifications Frameworks

Internationally, several initiatives have been undertaken to develop qualifications frameworks that span multiple national jurisdictions. In general, the objective of these frameworks is not to map national qualifications directly to an international

framework but rather, at a secondary level, to map the national qualifications *framework* in several countries to a single, shared and agreed international framework. This enables national frameworks to employ descriptors which are reflective of the national context and its culture of education and learning; while also enabling those countries to map each of their own levels of learning to an international standard, thus enabling transfer of students not just within the national context but within an international region. The mapping exercise can be illuminating for countries as they seek to reach a point of harmony on what represents a given level of learning, while also identifying differences between the types of learning provided in different national environments. Rather than being a restriction, the highlighting—through descriptors—of differences in types of learning in different environments enables institutions and learners to devise programmes which combine learning from several environments to provide a richer experience for all participants.

Perhaps the best known development of a regional qualifications framework was achieved through the Bologna process. This European process resulted in the identification of three cycles of higher education structured into the Qualifications Framework of the European Higher Education Area (QF-EHEA) (EHEA 2005). Each of the three cycles is described according to an internationally agreed set of descriptors (the so-called *Dublin Descriptors*). A later Europe-wide process resulted in the development of the European Qualifications Framework (EQF) (EQF 2006), an eight-level framework against which learning at all levels—not just in higher education—can be mapped. Most European countries have now completed a process of mapping their national qualifications frameworks to the EQF. The three cycles of the QF-EHEA are compatible with the top three levels of the EQF. The Europe-wide frameworks have served to better enable student transfer, credit transfer and the development of joint programmes throughout Europe. They also enable recognition of qualifications across Europe by all stakeholders in higher education, including employers and wider society in the same way as national qualifications frameworks have achieved this for individual countries.

We can now observe a hierarchy of qualifications frameworks each serving to achieve similar objectives in contexts of increasing cultural heterogeneity. National frameworks map qualifications nationally and international frameworks map national frameworks against each other. The next step is to map international frameworks against each other which has the benefit of enabling transfer between all those national jurisdictions aligned to the corresponding international frameworks. This, clearly, has significant benefits for transnational provision on a global scale.

One such initiative which can be undertaken is the mapping between the two European frameworks and the recently developed East African Qualifications Framework. Undertaking such an initiative will better enable the quality assurance of transnational programmes delivered in East Africa by European providers and ensure a shared understanding of those qualifications which are delivered by international providers in the context of the national qualifications systems in East Africa. In the next section of the paper, we provide initial reflections on the

potential for such a mapping, from the perspective of European transnational higher education providers.

East African Qualifications Framework for Higher Education

The East African Qualifications Framework for Higher Education (EAQFHE) was developed by the Inter-University Council for East Africa (IUCEA) and approved by the East African Community (EAC) Council of Ministers in April 2015. The initiative to develop the framework of qualifications followed the enactment of the East African Community Common Market Protocol in 2010—the result of a trade agreement (the East African Treaty) which sought to enable the free movement of goods, labour, services and capital among the five members of the East African Community: Burundi, Kenya, Rwanda, Tanzania and Uganda. The EAQFHE aims to enable the transfer and recognition of students, credit and qualifications among those five member countries (EAC 2015).

The EAQFHE is an eight-level framework with the top four levels (5–8) recognising learning in higher education at diploma, bachelor's degree, master's degree and doctorate levels or equivalent. Each of the eight levels has associated descriptors which identify the learning which is recognised by qualifications at that level as well as the naming of those qualifications. An accompanying credit system —the East African Credit Accumulation and Transfer System (EACAT) accounts for the volume of learning and enables the effective communication of learning achievements across national boundaries (Kerre 2015).

The framework is currently being mapped or has been mapped to the frameworks of member countries where such frameworks are already in place (Kenya's 10 level framework, Tanzania's 10 level framework, Rwanda's 7 level framework) and can be mapped to national frameworks to be developed in the future (e.g. Burundi, Uganda, and future members of the East African Community such as South Sudan).

Key Questions for Mapping of EAQFHE to EQF

The mapping of the explicit contents of EAQFHE to the EQF (incorporating the three cycles of the QF-EHEA) will enable transnational providers in Europe to articulate the level of their programmes in the context of the level of programmes provided in the East African Community (EAC) member countries. In particular, they will be able to address key questions such as:

- *Are the expectations for an EAC bachelor's, master's or doctoral degree different to the expectations for the same degree in Europe?*
- *Are the expectations for graduates of the secondary schooling system comparable to the expectations for graduates of the secondary school system in Europe?*

In many respects, these are questions which can be answered through a relatively straightforward desk exercise involving the review of learning outcomes. The more difficult questions relate to those skills and abilities which are *implicitly* associated with a given award but which are not articulated in a framework of qualifications.

International guidelines on transnational education make specific mention of the need to localise an award to the environment in which it is delivered. For example, the UNESCO/OECD (2005) guidelines on transnational education advise education providers to:

> Ensure that the programmes they deliver across borders and in their home country are of comparable quality and that they also take into account the cultural and linguistic sensitivities of the receiving country

In doing so, however, the education provider is changing the nature of the qualification which is being awarded to the student and is potentially causing an inconsistent interpretation of a given award. A bachelor's award aligned to a European Qualification Framework (EQF) member framework *probably* carries with it an assumption that the holder of the award has learning grounded in a European linguistic and cultural environment. If the same award, still aligned to the EQF, is made to a learner whose learning did not receive the same grounding, this assumption may be proven false. As such, any mapping exercise involving frameworks of qualifications from linguistically and culturally diverse environments, such as a potential future mapping between the EQF/QF-EHEA and the EAQFHE should account for the following:

- **Linguistic grounding**: The language level associated with an award should be explicitly mentioned to guide providers and to enable effective quality assurance of transnational education.
- **Cultural grounding**: Learners will acquire knowledge of national cultures when studying overseas through social interaction and informal activity. Such cultural norms and knowledge may be assumed by employers and other stakeholders for holders of given qualifications, and as such explicit highlighting of these in any mapping exercise will drive institutions to consider how these should be addressed in a transnational context.

Conclusions

Transnational education represents a large part of the international service industry and it promises to continue to grow into the future (Bannier 2016; Chen 2015; Knight 2007). Better shared structures across international contexts will be key enablers for ensuring that the quality of transnational delivery meets the expectations of its stakeholders, among whom the learners are the most important. The mapping of qualifications frameworks represents a key step in bringing together a shared understanding of quality and qualifications, and the mapping of regionally agreed international frameworks represents an ideal opportunity to undertake such an activity at scale.

Some key questions that such a mapping needs to consider are identified in this paper, as part of an initial reflection. First, are the expectations for higher education qualifications comparable? Second, are the expectations from outside the higher education system from lower levels on the framework comparable? Third, are local, cultural and language issues important, implicit aspects of the qualifications? If so, can these be explicitly captured in a mapping exercise so that a consistent, shared understanding of all aspects of learning associated with an international qualification can be achieved?

Only through the answering of these questions in a mapping exercise can transnational providers design the right type of programmes for the markets they wish to serve in an international context and ensure that *quality assurance will always travel*.

References

Bannier, B. J. (2016). Global trends in transnational education. *International Journal of Information and Education Technology, 6*(1), 80.

Chen, P.-Y. (2015). Transnational education: Trend, modes of practices and development. *International Journal of Information and Education Technology, 5*(8), 634.

EAC. (2015). Approval of the East African Qualifications Framework for Higher Education for its operationalization. Retrieved July 28, 2016, from http://www.eac.int

EAQAHE. (2010). *Quality assurance in transnational higher education*. Helsinki, Finland: The European Association for Quality Assurance in Higher Education.

EHEA. (2005). Qualifications Frameworks| EHEA. Retrieved July 28, 2016, from http://www.ehea.info/

EQF. (2006). learning opportunities and qualifications in Europe—European Commission. Retrieved July 28, 2016, from https://ec.europa.eu/

Francois, E. J., Avoseh, M. B., & Griswold, W. (2016). Perspectives in transnational higher education. Berlin: Springer.

Kerre, M. (2015). East Africa qualifications framework for higher education.

Knight, J. (2007). Cross-border higher education: Issues and implications for quality assurance and accreditation. Report: Higher education in the World 2007: Accreditation for quality assurance: What is at stake?

UNESCO/OECD. (2005). Guidelines for quality provision in cross-border higher education. UNESCO/OECD. Retrieved from http://www.oecd.org

Part II
Methodologies and Strategies for Holistic and Enterprising Learning

How and Why Malaysian Hospitality and Tourism Management Students Learn

S. Chee Choy and Tengku Elvirozita

Abstract This paper examines how and why hospitality management students learn in Malaysia. It makes a comparison between students' approaches to learning from two campus locations. The LALQ, a self-report measure of student approaches to learning was used to obtain the data. Pearson's product–moment correlations and *t*-tests were carried out to study the differences in the two populations of students. The results showed that there were significant correlations and differences between students from the two campuses. Students from the urban campus were more likely to be intrinsically motivated in the way they approach learning, while those from the rural campus were more likely to be extrinsically motivated given that they depend on significant others to influence their lives and learning approaches. The implications of the differences in students' approaches to learning were also discussed.

Keywords Hospitality management students · Learning · Learning approaches

Introduction

The trend in many classrooms today is to implement outcome-based learning which emphasises student-centred approaches with the intention of creating an environment where the student experience is meaningful and successful. The aim of this is to encourage deep learning (Biggs 1999) which requires students to actively participate and claim ownership of their learning. One missing element, however, in

S. Chee Choy (✉)
Centre for Education Psychology and Instructional Strategies, Perak Branch,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: choysc@mail.tarc.edu.my

T. Elvirozita
Faculty of Social Science and Humanities,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: elvirozita@acd.tarc.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_7

the haste to implement strategies and approaches to bring this about is not giving consideration to the personal thoughts and feelings of the individual that carries it out. As Tyler (1949), very succinctly wrote in his book Basic Principles of Curriculum and Instruction, sixty years ago, students learn through what they do and not what the teachers does. The teacher's task is to get students to engage in behaviours that will bring about the desired learning. The student's participation and cooperation are most important. However, for this to occur, students must have a certain level of awareness of why and how they learn before they can actively cooperate with the learning process. This cooperation is not possible when students' feelings and thoughts are not in tandem with what they are expected to learn. This is especially true for students in hospitality and tourism management (HTM)-related programmes where many of the courses are skills based.

This paper reports a preliminary study of undergraduate HTM students on how and why they learn which will include the strategies they use and their learner awareness levels. The study using the Learner Awareness Level Questionnaire (LALQ), developed and validated by Choy et al. (2015), attempts to determine the differences, if any, in learning strategies and the awareness levels of students from the two campuses. Comparisons of the scores from the awareness levels of the two groups of students will be carried out using correlations and *t*-tests will be used to determine its significance.

Learner Awareness

Understanding the learning behaviour of students is crucial to setting up teaching and learning strategies that enhances the student experience (Dale and McCarthy 2006). However, an understanding of how and why individuals learn specifically HTM students has received scant attention from academia (Hsu 1999). This is further complicated by higher education institutions taking in students from wide and varied fields, cultures and backgrounds into such programmes. Adding to the problem, students also tend to be more extrinsically motivated and do not value learning for the sake of it. Dale and McCarthy find in their study that students are becoming more consumerist in their approach and need guidance with the intrinsic value of learning. In a study of the learning styles of HTM students, Hsu further notes that they tend to become less people oriented after going through a hospitality programme. This finding is disconcerting because these students will be working in a people-oriented industry which requires appropriate interpersonal skills to function in properly.

When students learn there are skills within their control which according to Sherman (1985) are personal, conscious and purposeful. These skills are based on the understanding that 'learning is a personal activity requiring personal learning decisions and process management' (p. 88). This skill set includes time management, academic learning management and the ability to match course requirements to personal learning skills. To hone these learning skills, students must go through a process consisting of three aspects: affective, behavioural and cognitive (Choy

2002; Hall 2011). These three aspects occur simultaneously when learning and students are often unaware of its occurrence.

Bell (1993) defines learner awareness as an increased comprehension of subject content and the ability to use material learned. This definition although comprehensive concentrates mainly on increasing cognitive awareness of content material with little emphasis on affective and behaviour awareness when learning. Hence, learner awareness will influence the overall learning experience of students. According to Leo and Greene (2008), students draw inferences about what they learned regardless of whether they comprehend the task assigned which they called task awareness. They further note that students will draw conclusions based on the context; a task is presented which can involve their emotions as well as feelings. This implies that students will learn as long as the subject matter is interesting and of value to the learner and will be driven to learn if they can attain autonomy, mastery and purpose as they progress.

Aspects of the Learning Process

There is a fundamental difference between learning and education. Learning is definitely part of the education process but to be truly educative; it must be valuable and meaningful to an individual's life from a broader perspective. Teachers are often able to generate a great deal of learning in their students but if it cannot be applied to a larger part of their lives then its value is limited. Hence, learning must be holistic and applicable to a students' life. When taken from a constructivist perspective, learning empowers students to think on their own and ultimately arrive at truths that are embedded in their own backgrounds and world views (Williams and Burden 1997). From this view, learning consists of three aspects: affective, behavioural and cognitive.

The affective aspect of learning is essentially the value which students place on what they learn. This constitutes the attitudes, feelings and emotions students bring to what they learn and their responses to others around them, encompassing the ethical perspectives as well (Krathwohl et al. 1964). Hall (2011) observes that this aspect is important for the experiences students get from the learning process. She also highlights that it is entirely possible that the solution of generating student interest and promoting lifelong learning rests in the development of the affective aspect of learning.

The behavioural aspect of learning focuses on the abilities of students to apply and demonstrate the skills they have learned. Of the three aspects of learning, behavioural learning is the least studied. Nonetheless, it is important for physical actions, such as effective use of machines and tools, and is essential when carrying out tasks in a work place. The cognitive aspect comprises the thought processes associated with learning and actually consists of six different aspects beginning with knowledge progressing to higher levels and finally ending with evaluation. This is better known as Bloom's taxonomy (Bloom 1956).

In a study of HTM students, Hsu and Wolfe (2003) find more meaningful learning occurred during their industry placement than in the classroom. The reason for this was because during the placement students needed to use all three aspects of learning in order to complete their training, whereas the cognitive aspect is mainly stressed in the classroom. Attempts to establish a general framework of how students learn using the cognitive and affective aspects have been inconclusive on the usability and applicability of such a framework.

Research Problem

This paper investigates the approaches HTM students use to learn, measured using the LALQ. The four learner awareness levels: survival, establishing stability, approval and loving to learn will also be determined. 'Survival' is their awareness of having to adapt and survive everyday learning situations. 'Establishing stability' is the students' strive to achieve a level of stability in their lives. 'Approval' is the need to belong and to please others through their actions, and 'loving to learn' is their motivation to acquire new learning and skills to build on existing knowledge.

Objectives of the Study

Underpinning the research will be the following objectives:

1. To determine the four learner awareness levels (LAL): survival, establishing stability, approval and loving to learn present in HTM students.
2. To determine significant differences, if any, in the LAL scores of students from a rural and an urban campus environment.

Research Methodology

Participants

Students in this study were from the HTM division of two campuses, one urban and the other rural in Malaysia. The urban campus is in Kuala Lumpur, the capital city, and the rural campus is 40 km from a large city.

The students in the campuses were enrolled in the HTM degree and diploma programmes. The sample consisted of 359 students, with 127 from the urban campus and 232 from the rural campus. Of the 127 students from the urban campus,

74 were from the bachelor programme and 53 were from the diploma programme. All 232 students from the rural campus were from the diploma programme.

The urban sample consisted of 83 female and 44 male students. The age range of the sample was between 18 and 26 years. The response rate from these students was 96%. The rural sample had 131 female and 101 male students. The age range of the sample was between 18 and 22 years. The response rate of the students was 98%.

Procedures

The informed consent of these students was obtained and they were assured that the information they provided will only be viewed by the researchers and they will remain anonymous. As participation was on a voluntary basis, they were told they could withdraw from the research at any time. The questionnaire was given to students between their classes. Most of the questionnaires were returned before the start of the next class.

Materials

The LALQ developed and validated by Choy et al. (2015) was used in this study. The questionnaire consists of 21 items that measure the four learner awareness levels: survival, establishing stability, approval and loving to learn. The LALQ was designed to provide quick useful information about student learning. Respondents were asked to identify on a five-point Likert scale (5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree and 1 for strongly disagree). The questionnaire was administered using paper and pencil.

Results/Discussions

The data were subjected to test of normality. The skewness value of 0.40 and the kurtosis value of 1.86 were within the criteria for normal distribution (Hair et al. 2006). The first objective in this study was to determine the four LAL present in HTM students. The results of the LAL for the two groups of students as well as the overall scores of the students from both campuses are shown in Table 1.

Table 1 LAL scores for urban and rural students

LAL	Survival	Est. stability	Approval	Loving to learn
Urban students	2.39	3.77	3.44	3.64
Rural students	2.50	3.81	3.11	3.03
Overall	2.46	3.80	3.23	3.24

The LAL scores showed that HTM students from the urban campus scored lower for survival than students from the rural campus indicating that they were less likely to approach learning as a means of survival which according to Choy et al. (2015) indicated the perceived need for control over learning situations and the influence of significant others on why they learn, implying that HTM students from the rural campus were more likely to learn because of influences from significant others in their lives and perceived they had less control over their learning situations. It must be noted that 46.2% of students from the rural campus compared to 33.1% from the urban campus agreed with the following statement about 'survival': 'I give up easily especially when I feel the subjects are difficult'. This is the only statement on the LALQ for the survival scale that showed this trend.

The group of HTM students from the rural campus scored 3.81 for 'establishing stability' while those from the urban campus scored 3.77. This suggested that students from the rural campus were more likely to learn in order to establish a better future than the students from the urban campus. About 37.8% of the rural campus students compared to 28.7% of the urban campus students agreed with the following statement about 'establishing stability': 'I will just memorise my notes rather than analyse them in order to pass examinations'. Students from both campuses showed similar trends in their responses for the other statements.

The score for 'approval' was higher for the urban campus students, 3.44 than the rural campus students, 3.11. This suggested that students from the urban campus could have more confidence to achieve their learning goals than those from the rural campus. There were two statements in this level where there were differences in the response trends for the two campuses. For the first statement: 'I feel confident I can pass my examinations with good grades' showed 56.7% of students from the urban campus agreed with the statement compared to 31.1% from the rural campus. For the second statement: 'I think I will have more friends if I do well in my studies', 37.8% of students from the urban campus agreed with the statement compared to 16.9% of students from the rural campus.

Students from the urban campus scored 3.64 for 'loving to learn' while students from the rural campus scored 3.03. This suggested that students from the urban campus were more motivated to acquire new skills and building on existing knowledge than those from the rural campus. There were more students from the urban campus agreeing to the statements for this level than those from the rural campus. For the statement: 'I think learning is fun' 53% of students from the urban campus agreed with the statement compared to 27.6% from the rural campus. About 41.7% of students from the urban campus agreed compared to 15.5% from the rural campus for the statement: 'I love learning all through my school years until now'. About 56.7% of students from the urban campus compared to 19.4% from the rural campus agreed with: 'I like to think of new ways to learn something'.

The second objective was to determine significant differences, if any, in the LAL scores of HTM students from the rural and urban campus. In this study, we hypothesise that students from the rural campus would have higher survival and establishing stability scores than urban campus students as they may perceive fewer opportunities available to them. However, students from the urban campus would

Table 2 Pearson product–moment correlations between the scores for the four scales of the LALQ and campus location

	1.	2.	3.	4.
1. Survival				
2. Establishing stability	−0.05			
3. Approval	−0.03	0.31**		
4. Loving to learn	−0.27**	0.30**	0.45**	
5. Campus location	−0.16**	0.04	0.24**	0.38**

Note $^{**}p < 0.01$

have higher approval and loving to learn scores as their learning environment may be more varied and enriching which enhances the learning experience. Correlations were computed in order to examine the interactions between the scales of the LALQ and campus location. Finally, a *t*-test was used to determine the difference, if any, between the two groups of students. In order to explore these relationships, Pearson coefficients were calculated (Table 2).

There was a small negative correlation between 'survival' and campus location, $r = -0.16$, $n = 359$, $p < 0.01$, with the urban campus associated with low 'survival' scores. In the relationship between 'approval' and campus location, $r = 0.24$, $n = 359$, $p < 0.01$, there was a small, positive correlation between the two variables with the urban campus associated with high 'approval' scores. There was also a small, positive correlation between 'loving to learn' and campus location, $r = 0.37$, $n = 359$, $p < 0.01$, with the urban campus associated with high 'loving to learn' scores.

An independent samples *t*-test was conducted to compare the 'survival' scores for the two campus locations. The Levene's test of homogeneity of variance indicated equal variances was assumed for 'survival'. 'Approval' and 'loving to learn' while equal variances were not assumed for 'establishing stability' and the appropriate *t*-value obtained.

There was a significant difference in scores for students from the rural campus ($M = 2.51$, SD = 0.50) and urban campus ($M = 2.33$, SD = 0.54); $t(359) = 2.99$, $p = 0.003$, two tailed). The magnitude of the differences in the means (mean difference = 0.18, 95% CI: 0.06 to 0.30) was small (eta squared = 0.008).

There was also a significant difference in the 'establishing stability' scores for students from the two campus locations for the independent samples *t*-test. For this score, students from the rural campus ($M = 3.78$, SD = 0.60) and urban campus ($M = 3.84$, SD = 0.46); ($t(359) = -0.91$, $p = 0.36$, two tailed). The magnitude of the differences in the means (mean difference = −0.06, 95% CI: −0.17 to 0.06) was small (eta squared = 0.001).

The last two scores 'approval 'and 'loving to learn' also had significant differences for students in the rural campus and urban campus when the scores were compared using the independent samples *t*-test. For the 'approval' scores, students from the rural campus ($M = 3.14$, SD = 0.59) and urban campus ($M = 3.47$, SD = 0.60); ($t(359) = -4.59$, $p = 0.00$, two tailed). The magnitude of the differences in the means (mean difference = −0.32, 95% CI: −0.46 to −0.18) was small

(eta squared = 0.001). For the 'loving to learn' scores, students from the rural campus (M = 3.07, SD = 0.73) and urban campus (M = 3.72, SD = 0.70); (t (359) = −7.59, p = 0.00, two tailed). The magnitude of the differences in the means (mean difference = −0.65, 95% CI: −0.82 to −0.48) was small (eta squared = 0.001).

The results showed that there were significant differences in how and why HTM students learn for the rural and urban campuses. There was also a small but significant correlation between 'survival' 'approval', 'loving to learn' and campus location. 'Survival' had a negative correlation with campus location while the other two had positive ones. The negative correlation between 'survival' and campus location implied that students in the rural campus tend to approach learning in order to please their significant others and believed that they had less control over their learning than those from the urban campus. This finding does not support Hsu and Wolfe's (2003) research that suggested students were less people oriented. For the rural campus students at least, they were willing to be influence by significant other in their lives, implying that were people oriented.

The positive correlation between 'approval', 'loving to learn' and campus location implied that urban students learned in order to impress their friends and had greater confidence to graduate on time suggesting that they were more extrinsically motivated which supports findings by Hsu (1999). These students found learning interesting and enjoyable similar to results found by Dale and McCarthy (2006) on learning styles among HTM students. Hence, students will develop a love for what they learn as long as they find learning meaningful.

Contributions of the Study

As stated at the beginning of this paper, there is a dearth of studies into student approaches to learning among HTM students. Hsu (1999) noted that studies into learning among HTM students were further complicated by culture as well as the varied backgrounds of HTM students. The results of this study will contribute to increasing knowledge about students' approaches to learning for HTM programmes. It will also further provide important information to help enhance the delivery of such programmes.

Conclusions

The results of this study showed that there were differences in approach to learning for HTM students' from different campuses. Students from the rural campus seemed less confident about passing examinations and were more likely to be influenced by significant others in their lives. In contrast, those from the urban campus were more confident about reaching their learning goals. They were also

more likely to build new skills and add on to their existing knowledge. The urban students seemed more confident overall than the rural students.

There was a difference in the scores for the four LAL scales with students from the rural campus scoring higher for 'establishing stability' than those from the urban campus. However, students from the urban campus scored higher for the other three scales. It was not clear from the results whether the difference in scores was due to the overall learning environment in the campuses or the programmes the students were enrolled. Further studies need to be conducted on the factors that determined the differences in the scores.

References

Bell, A. (1993). Awareness of learning, reflection and transfer in school mathematics. *British Society for Research into learning mathematics* (pp. 1–6). Manchester: BSLRM.

Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research and Development, 18*(1), 57–75.

Bloom, B. S. (1956). *Taxonomy of educational objectives*. Boston: Allyn and Bacon.

Choy, S. C. (2002). *An investigation into the changes in student perceptions of and attitudes towards learning English as a second language in a Malaysian College.* Unpublished PhD Thesis, University of Exeter, Exeter, United Kingdom.

Choy, S. C., Goh, S. C., & Sedhu, D. S. (2015). How and why students learn: Validation and development of the learner awareness questionnaire. *International Journal of Teaching and Learning in Higher Education*.

Dale, C., & McCarthy, P. (2006). I like your style: The learning approaches of leisure, tourism and hospitality students studying generic modules. *Journal of Hospitality, Leisure, Sport and Tourism Education, 5*(2), 48–58.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Pearson Education.

Hall, R. (2011). Affective assessment: The missing piece of the educational reform puzzle. *Morality in Education*, 7–10.

Hsu, C. H. (1999). Learning styles of hospitality students: Nature or nurture? *International Journal of Hospitality Management, 18,* 17–30.

Hsu, C. H., & Wolfe, K. (2003). Learning styles of hospitality students and faculty members. *Journal of Hospitality & Tourism Education, 15*(3), 19–28.

Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). *Taxanomy of educational objectives: Handbook II: Affective domain*. New York: McKay.

Leo, P. D., & Greene, A. J. (2008). Is awareness necessary for true inference? *Memory & Cognition, 36*(6), 1079–1086.

Sherman, T. M. (1985). Learning improvement programs: A review of controllable influences. *Journal of Higher Education, 56*(1), 85–100.

Tyler, R. W. (1949). *Basic principles of curriculum and instruction*. Chicago: University of Chicago Press.

Williams, M., & Burden, R. L. (1997). *Psychology for language learners*. London: Cambridge University Press.

Effectiveness of Cooperative Learning in Developing Linguistic Competence of College Students

Zaldy Maglay Quines

Abstract This study sought to identify the effectiveness of cooperative learning strategies in developing linguistic competence of college students. This study used the pseudo-experimental method using the repeated measures design. Correlation *t*-test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory tests, and Pearson moment correlation was used to determine the correlation between the mean scores on achievement tests and attitude towards the methods employed. Findings show that both methods can develop linguistic competence of students, but cooperative learning has a higher mean gain score as compared to the lecture–discussion method. Though "cooperative learning" and "lecture–discussion method" can enhance favourable attitude, cooperative learning strategy has influenced greater positive attitude on the learner as compared to the lecture–discussion method. There is no correlation between linguistic competence and attitude towards cooperative learning strategy and lecture-discussion method.

Keywords Cooperative learning · Lecture–discussion method · Linguistic competence

Introduction

The twenty-first century has pushed innovations in the teaching–learning process to attune into the demands of the present generation. At present, the focus of education is shifted "from what to teach" to "how to teach". The use of approaches that would best deliver the desired objectives must be employed. The search for efficient and effective approaches in teaching shall be the ultimate route of efficient and effective teachers to achieve meaningful learning.

Z.M. Quines (✉)
English Language Institute, Jubail Industrial College, P.O. Box 10099,
Jubail Industrial City 31961, Kingdom of Saudi Arabia
e-mail: quines_z@yahoo.com.ph; Quines_z@jic.edu.sa

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_8

There are changes in the world that undeniably affect the conventional ways of teaching. Bilbao et al. (2006) re-emphasized the significance of the 2001 UNESCO conference reports that had emphasized the multifarious changes in the global scene in education. The "UNESCO Commission on Education for the Twenty-first Century" proposed that the "learning process" should be based on the "Four Pillars of Education—Learning to Know; Learning to Do; Learning to Live Together; and Learning to Be".

In order to achieve these "Four Pillars of Education", innovative strategies shall be employed. Oxford (1990) observes that language learning strategies in recent years have been shifted in focus from the teacher to the learner. The shift of focus suggests that the success of language learning rests on the learners' ability to fully utilize every opportunity to learn and employ the English language. Cooperative learning is one of the alternatives that teachers can use to ensure maximum participation of students in their classes. In this method, every learner is expected to be involved actively in his group because he is motivated by the "force of cooperation".

Cooperative Learning and Lecture–Discussion Method

Cooperative learning refers to a method of instruction whereby students work together in groups to reach common goals. Within cooperative learning, students benefit from sharing ideas rather than working alone. Students help one another so that all can reach some measure of success. This is in contrast to the lecture-discussion method where students work individually or competitively. In the traditional method, students are generally concerned with improving their own grade, and goals are individualistic rather than group-wide.

The different proponents of cooperative learning define vividly the description and discuss clearly the structure of the different cooperative strategies. Ferrer (2008) explains that cooperative learning is an instructional strategy that capitalizes on the energy and coordination of students working in groups. It is clear that everyone shall be involved to maximize the design of this strategy. Johnson and Johnson (1994, 2009) expound that cooperative learning means instructionally using small groups so that students can work together to maximize their own and each other's learning. Slavin (2006) illuminates that cooperative learning involves students working together as equals to accomplish something of importance to all of them.

Interaction and collaboration are always emphasized and developed when cooperative learning is used in the teaching–learning process. Kagan (1990) claims that cooperative learning structures are content-free ways of organizing social interaction in the classroom. He also stresses that in cooperative learning, group work is carefully designed to promote group interdependence and individual responsibility. It provides a chance for skill learning while at the same time teaching responsibility. Corpuz and Salandanan (2007) and Newby et al. (2006) illustrate

that cooperative learning approach makes use of a classroom organization where students work in groups or teams to help each other to learn.

The psychological, physiological, and sociological aspects of a learner affect his academic performance. Slavin (1995) gives and explains three reasons why cooperative learning works. Cooperative learning has "motivational effect". Learning is seen as an obligation and a valued activity because the group success is based on it and one's groupmates will reward it. Cooperative learning has "cognitive developmental effect". According to Vygotsky (1978), collaboration promotes cognitive growth because students' model for each other more advanced ways of thinking than any would demonstrate individually. According to Piaget (1950), collaboration among peers hastens the decline of egocentrism and allows the development of more advanced ways of understanding and dealing with the world. Cooperative learning has "cognitive elaboration effect". New information that is elaborated is more easily retrieved from memory than information that is not elaborated. A particularly effective means of elaboration is explaining something to someone else. He stresses also that communication is always involved in cooperative learning.

Linguistic Competence and Cooperative Learning

Linguistic competence was defined in 1965 by Noam Chomsky as the system of linguistic knowledge possessed by native speakers of a language. It is, according to Chomsky, this system of knowledge that makes it possible for speakers to produce and understand an infinite number of sentences in their language and to distinguish grammatical sentences from ungrammatical sentences.

Bachman and Palmer (1996) note that effective language use requires both "organizational knowledge" (what is said) and "pragmatic knowledge" (how it is said). Not only must a speaker demonstrate lexical and structural language knowledge, but also effectively implement that knowledge in real-time conversations. The implication would seem to be that, in the development of descriptive rating scales, static descriptions of language, lexical or structural, be tempered by recognition of the linear demands of conversation. One cannot expect demonstration of lexis or structure outside the topic boundaries of the conversation. Similarly, students should be given limited credit for the demonstration of language knowledge that does not contribute effectively to the unfolding discourse.

Language is best acquired when it is used in a way that is meaningful to the student. Cooperative learning provides opportunities for students to express themselves in a functional manner which is personally relevant to them. Students are using the language for a specific purpose, usually to meet certain group goals. The cooperative learning setting also provides for frequent use of the language. The fact that students are in small group settings allows for much greater opportunities for language use than the traditional classroom.

Research Problem

Despite the adequate classroom exposures of students in the English language, many of them could still hardly master and use the language. One reason of the non-mastery of the target language is the lack of authentic exposure of students where they could use the language. Students are also hesitant to communicate to their classmate in English because they are not given the opportunity to do so. In the traditional method of teaching a second or foreign language, students are required to simply listen and take down notes. When students could not understand the lesson, they are not motivated or encouraged to ask questions because they might be embarrassed, and most of them become passive in the classroom. High achievers are sometimes hesitant to help the slow achievers since the former are not required, obliged, or motivated to help the latter.

It is in this context that this study would like to unravel other cooperative learning alternatives that would surely involve students and make them more participative. The researcher wants to learn and share the processes involved in executing meaningful and productive cooperative learning, and to determine its effects to the teaching–learning process and achievements of students.

Objectives of the Study

This study aimed to identify the effectiveness of cooperative learning strategies in developing the linguistic competence of students. Specifically, it sought to answer the following questions:

1. How effective is cooperative learning strategy in developing linguistic competence as compared to the traditional lecture–discussion method?
2. What is the attitude of the students towards the two teaching methods employed?
3. Is there a relationship between language competence and attitude towards cooperative learning/lecture–discussion method?

Research Methodology

- **Research Design**. This study used the pseudo-experimental method using the repeated measures design. It is repeated because each section was exposed alternately to both strategies—the cooperative learning and lecture-discussion. A pretest was administered to the samples before the discussion of every lesson. The same test was used in the posttest which was administered at the end of every lesson.

- **Sampling Procedure**. The 105 subjects of this study were taken from the two sections of first year BEED students who were enrolled in English 12-Grammar and Composition 2. There were 53 students in BEED-B and 52 students in BEED-A. The grouping was based on their previous grade in English. There were ten groups in each class, each composed of high, average, and low achievers.
- **Research Instruments**. There were two instruments administered to the samples. The "Achievement Test" for linguistic competence of the samples in the chosen topics. The "Attitudinal Inventory Scale Test" was used to determine the attitude of students towards the two methods employed.
- **Collection of Data**.
  Pretreatment Phase. Before the introduction of new lesson, a pretest was conducted to the samples.
  Treatment Phase. The different cooperative learning strategies and lecture–discussion method were employed in all the specified topics for the duration of the study. The cooperative learning strategies used were Student Teams Achievement Divisions (STAD), Teams-Games-Tournament, and Jigsaw. The researcher used the same references, quizzes, materials, and seatwork for both classes.

Schedule of the two approaches

Week and topic	Section	Method
1. Sentence fragment	A	CL (STAD)
	B	LMD
2. Run-on sentence	A	LMD
	B	CL (STAD)
3. Misplaced modifier	A	CL (TGT)
	B	LMD
4. Dangling modifier	A	LMD
	B	CL (TGT)
5. Faulty parallelism	A	CL (Jigsaw)
	B	LMD
6. Subject–verb agreement	A	LMD
	B	CL (Jigsaw)

  Posttreatment. The achievement tests were checked, evaluated, and compared based on the research questions. The attitude inventory scale was administered, checked, evaluated, and compared based on the research question.
- **Analysis of Data**. Correlation *t*-test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory tests, and Pearson moment correlation was used to determine the correlation between the mean scores on achievement tests and attitude towards the methods employed.

Results/Discussions

See Tables 1, 2, 3, 4, 5, 6, 7, and 8.

Effectiveness of cooperative learning strategy in developing linguistic competence as compared to the traditional lecture–discussion method. The mean gain scores of the different lessons under cooperative learning are higher than the mean gain scores under lecture–discussion method. Though the mean gain scores are higher under cooperative learning, the computed *t*-value proves that there is no significant difference between the mean gain scores of the lecture-discussion

Table 1 Performance of students taught under the lecture–discussion method in the pretest and posttest

Topics	Mean standard deviation	Pretest	Posttest
Sentence fragments (n = 52)	Mean	3.08	5.17
	Standard deviation	1.10	1.95
Run-on sentences (n = 53)	Mean	3.51	5.83
	Standard deviation	1.39	1.82
Misplaced modifiers (n = 52)	Mean	3.46	5.31
	Standard deviation	1.42	1.97
Dangling modifiers (n = 53)	Mean	3.55	5.30
	Standard deviation	1.78	2.12
Faulty parallelism n = 52	Mean	3.04	5.27
	Standard deviation	1.47	1.93
Subject–verb agreement (n = 53)	Mean	2.89	4.85
	Standard deviation	1.37	2.18

Table 2 Performance of the students taught under the cooperative learning in the pretest and posttest

Topics	Mean standard deviation	Pretest	Posttest
Sentence fragments (n = 52)	Mean	3.11	6.85
	Standard deviation	1.29	1.80
Run-on sentences (n = 53)	Mean	3.06	6.85
	Standard deviation	1.13	1.80
Misplaced modifiers (n = 52)	Mean	3.58	7.19
	Standard deviation	1.32	1.83
Dangling modifiers (n = 53)	Mean	3.40	7.58
	Standard deviation	1.58	1.53
Faulty parallelism n = 52	Mean	3.08	6.92
	Standard deviation	1.30	1.79
Subject–verb agreement (n = 53)	Mean	2.62	7.21
	Standard deviation	0.84	1.82

Table 3 Comparison between the pretest and posttest scores of the students taught with lecture–discussion method

Subject matter	Pretest		Posttest		Comp. *t*-value	Prob.
	M	SD	*M*	SD		
Sentence fragments	3.08	1.10	5.17	1.95	8.68**	0.00
Run-on sentences	3.51	1.39	5.83	1.82	21.44**	0.00
Misplaced modifiers	3.46	1.42	5.31	1.97	7.69**	0.00
Dangling modifiers	3.55	1.78	5.30	2.12	17.698**	0.00
Faulty parallelism	3.04	1.47	5.27	1.93	7.39**	0.00
SV agreement	2.89	1.37	4.85	2.18	12.29**	0.00

** Significant at 0.01

Table 4 Comparison between the pretest and posttest scores of the students taught under cooperative learning

Subject matter	Pretest		Posttest		Comp *t*-value	Prob.
	M	SD	*M*	SD		
Sentence fragments	3.11	1.29	6.85	1.80	15.03**	0.00
Run-on sentences	3.05	1.39	7.29	1.82	8.94**	0.00
Misplaced modifiers	3.58	1.32	7.19	1.83	15.52**	0.00
Dangling modifiers	3.40	1.58	7.58	1.58	5.95**	0.00
Faulty parallelism	3.08	1.30	6.92	1.80	17.40**	0.00
Subject–verb agreement	2.62	0.84	7.21	1.82	12.29**	0.00

** Significant at 0.01

Table 5 Comparison of the mean gain scores of the lecture-discussion and cooperative learning along the six lessons

Lesson	Mean gain score		Computed *t*-value	Prob.
	LDM	CL		
Sentence fragments	2.10	3.74	4.73**	0.00
Run-on sentences	2.32	4.23	5.84**	0.00
Misplaced modifiers	1.85	3.60	5.26**	0.00
Dangling modifiers	1.75	4.17	6.39**	0.00
Faulty parallelism	2.23	3.85	4.34**	0.00
Subject–verb agreement	1.96	4.60	6.74**	0.00

** Significant at 0.01

method and cooperative learning along the six lessons. This shows that cooperative learning and lecture method are both statistically considered effective methods in developing linguistic competence.

Attitude of the students towards the two teaching methods employed. Based on the computed *t*-value, it can be inferred that cooperative learning has influenced greater positive attitude change on the learner as compared to lecture-discussion method.

Table 6 Comparison of the attitude of the students towards the use of cooperative learning and lecture-discussion

Group/Time	Mean	SD	Standard error of difference	Computed *t*-value	Prob.
CL					
Pretest	42.29	4.04	0.468	2.681**	0.000
Posttest	45.41	3.38			
LDM					
Pretest	41.64	2.94	0.438	3.455**	0.001
Posttest	43.15	3.42			

** Significant at 0.05

Table 7 Comparison between the mean gain attitude score of students in both cooperative learning and lecture-discussion

Group	Mean gain attitude score	SD	Standard error of difference	Computed *t*-value	Prob.
CL	3.12	4.791	0.645	2.497*	0.014
LD	1.51	4.492			

** Significant at 0.05

Table 8 Relationship between attitude towards cooperative learning/lecture-discussion and the linguistic competence of the students

Variable	Correlation coefficient	Probability
Linguistic competence and attitude towards cooperative learning	0.092^{ns}	0.352
Linguistic competence and attitude towards lecture-discussion	0.157^{ns}	0.109

ns not significant

Relationship between attitude towards cooperative learning/lecture-discussion and the linguistic competence of the students. The attitude of students towards cooperative learning or lecture–discussion method has no significant relationship with linguistic competence. The correlation coefficient results for linguistic competence and attitude towards cooperative learning indicate that both are not significant.

Contributions of the Study

- Curriculum planners and administrators may use this study as a basis for curriculum revision emphasizing the development of linguistic competence using cooperative learning strategies.

- Teachers may employ the different cooperative learning strategies to improve the teaching–learning process and the linguistic competence of their students.
- Other researchers may also use this study as a reference in order to come up with other related studies.

Conclusions

Cooperative learning as an instructional method is an effective alternative to the conventional method of developing linguistic competence. When teachers are properly guided in using this method, learners will surely develop higher linguistic competence.

References

Bachman, L., & Palmer, A. (1996). *Language testing in practice*. Oxford: Oxford University Press.

Bilbao, P., Corpuz, B., Llagas, A., & Salandanan, G. (2006). *The teaching profession*. Manila: Lorimar Publishing Co., Inc.

Chomsky, Noam. (1965). *Aspects of the theory of syntax*. Cambridge, MA: MIT Press.

Corpuz, B., & Salandanan, G. (2007). *Principles of teaching I*. Quezon City: Lorimar Publishing, Incorporation.

Ferrer, L. M. (2008). B.E.S.T. (Building Effective Strategies for Teaching of Science). Manila: Rex Bookstore, Inc.

Johnson, D., & Johnson, R. (1994). *Learning together and alone: Cooperation, competition, and individualization* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Johnson, D., & Johnson, R. (2009, March). The cooperative link. *The Newsletter of the Cooperative Learning Institute*, *24*(1).

Kagan, S. (1990). *Cooperative learning resources for teachers*. California: Resources for Teachers.

Newby, T., Stepich, D., Lehmen, J., & Russel, J. (2006). *Educational technology for teaching and learning*. Ohio: Pearson Education Inc.

Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Newbury: House Publishers.

Piaget, J. (1950). *The psychology of intelligence*. New York: Harcourt.

Slavin, Robert E. (1995). *Cooperative learning: Theory, research and practice* (2nd ed.). Boston: Allyn & Bacon.

Slavin, Robert E. (2006). *Educational psychology theory and practice*. Boston, MA: Pearson Education Inc.

Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

The Mediating Role of Learners' Awareness on Malaysian and American Students' Approaches to Learning

S. Chee Choy, Jutta Street, Lorae Roukema and Joanne Sau-Ching Yim

Abstract The mediating role of learners' awareness on learner behaviour was determined using the 21-item Learner Awareness Levels Questionnaire (LALQ) and structural equation modelling (SEM) using data from 2645 Malaysian students and 316 American students. The results suggest that student approaches to learning for the Malaysian and American samples were different. Learner awareness was related to affective learning for Malaysian students while for American students it was related to cognitive learning. Learner awareness partially mediated learner behaviour for both cognitive and affective learning among Malaysian students while it fully mediated learner behaviour for cognitive learning among American students.

Keywords Student approaches to learning · Structural equation modelling · Mediation · LALQ · Student learning

S. Chee Choy (✉) · J.S.-C. Yim
Centre for Education Psychology and Instructional Strategies,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: choysc@mail.tarc.edu.my

J.S.-C. Yim
e-mail: yimsc@mail.tarc.edu.my

J. Street
Faculty of Psychology, Campbell University, Buies Creek, USA
e-mail: streetj@campbell.edu

L. Roukema
Faculty of Education, Campbell University, Buies Creek, USA
e-mail: Roukema@campbell.edu

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_9

Introduction

The LALQ (Choy et al. 2016) a self-reporting questionnaire was developed and validated to measure the learning approaches of Malaysian students. The current study is interested in determining the similarities in approaches to learning with Malaysian and American students using the LALQ. This paper will report on the comparison of student approaches to learning between the two countries.

Research Problem

Rather than allowing students to learn at their own pace, teachers control the pace of learning through their lessons which are closely based on the syllabus that needs to be taught. In many instances, perhaps in the East more than the West, students continue to be passive learners who extensively use rote learning to help learn course content (Hiew 2012). This finding is refuted by Kember (2000) who argues that passivity is due to the teaching strategies used in schools and universities and, given a context that encourages participation in class, students can become active learners. Passivity among Asian students is still a point of contention with educators. Many published articles by Asian researchers find evidence of passive and rote learning among students in their classrooms. In Western societies, the USA specifically, there has been a push to promote a more learner-centred, active approach to instruction. The current study recognises that while learning strategies are important, students' awareness of approaches to learning may mediate learning.

Learning occurs when individuals use a combination of affective, cognitive and psychomotor (behaviour) learning (Hall 2011). It is a process which results in the continued growth and change in students and determines how information is taken in and connected into something that is meaningful. Within the three aspects of learning are multiple levels of learning that progress from the basic surface learning to a more complex deeper learning (Kember 2000). Students often use these three aspects of learning without being fully aware of them. According to Flavian (2016), every individual has different abilities and limits that construct the self. Hence, by developing awareness of these components and of the environment an individual lives in, individuals can achieve fulfilment of the self. Choi (2014) further noted that the way in which a student learns and the reasons for learning will influence their choices in later life resulting in the development of learner identity.

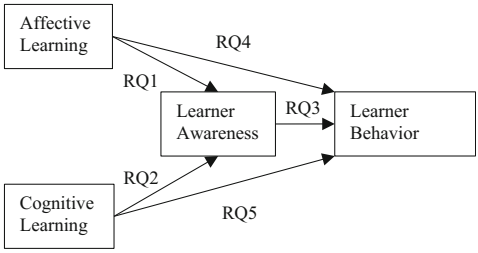
As students learn, they interact with the world and hence change their conception of things, expanding their awareness through the process. Entwistle (2000) suggested that the end result of a process of broadening the awareness of the nature of learning may involve students having a fully developed conception of learning, being aware of the different contexts to which the learning can be used and being able to adapt it to their learning behaviour. Rassaei (2015) noted that learners' awareness is the cornerstone of reflection, and without awareness reflection cannot

occur. Learning is more effective when students are able to gain an awareness of what they are trying to learn and reflect on it. Manavipour and Saeedian (2016) found that the awareness in which students approaches their thoughts and feelings in a non-judgemental and open manner will have greater beliefs of success.

A main theme in the study of learning approaches has been their connection to personality factors. The examination of this relationship has yielded divergent findings in American and international students (e.g. Dutch, British, Scottish and Canadian). Of the Big Five, conscientiousness, extraversion and openness to experience have on balance primarily yielded positive associations with academic success whereas neuroticism appears rather consistently associated with lower academic success (Busato et al. 2000; O'Connor and Paunonen 2007). In addition to personality factors, the relationship between learning style and actual or preferred learning strategies employed by students has been examined. Busato et al. (2000) found no significant association between learning style and academic success. A study by Bhagat et al. (2015) showed that such results may be due to students' lack of knowledge of their own learning style. Bhagat et al. exposed 50 pre-med undergraduates to the following steps: (1) assessment of individual learning style, (2) awareness lecture about the various learning styles and the benefit of using a mixed method approach when studying and (3) small group discussions. A follow-up comparison three months later showed changes in the students' visual, aural, read/write, and kinesthetic (VARK) scores and evidence that students had started using a mixed method learning approach. These studies implied that certain awareness factors could play a role in learner behaviour. Therefore, a cross-cultural study on the mediating role of learner awareness of learning behaviour will add to the existing knowledge on student approaches to learning.

Objectives of the Study

This article reports on the mediating role of learners' awareness on learning behaviour among Malaysian and US undergraduates. The following conceptual framework will underpin the study:



The following research questions were formulated as a guide:

RQ1: Does affective learning (AL) have a significant effect on learner awareness (LA)?
RQ2: Does cognitive learning (CL) have a significant effect on learner awareness (LA)?
RQ3: Does learner awareness (LA) have a significant effect on learner behaviour (LB)?
RQ4: Does learner awareness (LA) mediate the effect of affective learning (AL) on learner behaviour (LB)?
RQ5: Does learner awareness (LA) mediate the effect of cognitive learning (CL) on learner behaviour (LB)?

In this study, learner behaviour (LB) is defined as the behaviour students exhibit when they are learning. Cognitive learning (CL) consists of the perceptions of and reasons why they learn. Affective learning (AF) is the feeling students have when they learn or are learning. Learner awareness (LA) is the awareness students have of why and how they learn.

Research Methodology

As the 21-item questionnaire had been validated using a Malaysian student population, it was given to a review group of 10 native speakers of American English to ensure the questionnaire could be understood by an American student population. These students were representatives of the population who evaluated the flow and vocabulary of the original survey for ease of comprehension. As a result, changes in vocabulary and syntax, not content, were made in order to adjust the original survey to standard American English and facilitate comprehension of the survey by American students.

The 21-item LALQ was administered to 2645 Malaysian undergraduate students (1761 females and 884 males) enrolled in various bachelor programmes in a Malaysian university as a paper-and-pencil test. In the USA it was administered online to 316 undergraduate students (258 female and 58 male) enrolled in various bachelor programmes in an American University. The students came from a number of faculties and were all full-time students. All the students were told that they could withdraw from the study at any time they wished and the data they provided would be kept confidential. The data were then encoded and entered into SPSS (version 16) for initial analysis.

Research questions were tested with AMOS 21, while the mediation analysis adopted Baron (1986) conditions which determined mediation if there was (a) significant association between the independent variable and the dependent variable, (b) significant association between the independent variable and the mediator variable, (c) the proposed mediator significantly predicts the outcome and lastly (d) the association between the initial variable and the outcome variable was attenuated after controlling for the proposed mediator. In addition, the bootstrap method was employed to develop accurate estimates of standard error of the indirect

effect with 2000 bootstrap samples. If the 95% confidence interval (CI) for the estimate of the indirect effect did not include zero, the effect concerned was considered statistically significant at the 0.05 level (Shrout and Bolger 2002).

Results/Discussions

EFA for Malaysian and American Students

Before conducting the confirmatory factor analysis (CFA) for the Malaysian (M) and American (A) samples, two indicators were tested for sample appropriateness for such an analysis. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy index was 0.88 for M and 0.87 for A, and Bartlett's test of sphericity was significant $\chi^2 = 1974.14$, $p < 0.001$ for M and $\chi^2 = 2714.49$, $p < 0.001$ for A, indicating that the samples and correlation matrix were within an acceptable range for the analysis. Only eigenvalues that exceeded the corresponding values from the random data set were retained. Initial analysis with a factor loading of 0.50 was used as the cut-off point for variable acceptance. Five factors emerged with eigenvalues greater than one, accounting for 60.3% of the variance in the respondents' scores. Rotation converged after 6 and 5 iterations for M and A samples, respectively. The first four factors accounted for 55.5 and 64.0% of variance in the M and A respondents, respectively. The eigenvalues of these four factors when compared using the parallel analysis of an equivalent random data set were higher. Based on the results of the analysis, it was decided that a criterion loading of higher than 0.45 would be used to select items for further analysis. This yielded 21 items with loadings ranging from 0.50 to 0.93.

Confirmatory Factor Analysis for Malaysian and American Students

The four-factor solution seemed to be parsimonious and provided a better interpretation of the aspects of student approaches to learning. Hence, the four factors were named 'Learner Behaviour', 'Cognitive Learning', 'Affective Learning' and 'Learner Awareness'. Reliabilities (α) for each of the factors were given as follows: M: 0.84, A: 0.89 for 'Learner Awareness'; M: 0.79, A: 84 for 'Learner Cognition'; M: 0.83, A: 0.70 for 'Learner Affect'; and M: 0.60, A: 0.82 for 'Learner Behaviour'. Although Cronbach's alpha value for 'Learner Behaviour' for the M sample was relatively low, the mean inter-item correlation for the factor was between the optimal range of 0.2–0.4 (Pallant 2011).

The four factors were hypothesised to vary with each other. An examination of the goodness of fit for the four-factor model and the final analysis showed that the

model is acceptable. In order to compare the goodness of fit for the model, maximum likelihood estimation, a technique commonly used for CFA (Pallant 2011) was used as there were no universally accepted sets of criteria to prove model fit. The initial SEM model did not show acceptable GOF indices and several modifications were made. Several accepted goodness-of-fit (GOF) indices were computed for the initial SEM model and the final SEM model as shown in Table 1.

Based on the measurement model and fitness index measurement, Tables 2 and 3 present the results for the five RQs.

Table 1 GOF indices for the final SEM model for Malaysian and American samples (Browne and Cudeck 1993)

GOF indices	Recommended guidelines	Malaysia model	US model
Chi-square (χ^2)	The least	1557.89	154.71
Degrees of freedom		183	87
p value	≥ 0.05	0.00	0.00
RMR	≤ 0.10	0.04	0.07
RMSEA	≤ 0.08	0.04	0.07
GFI	>0.80	0.97	0.88
NFI	>0.80	0.96	0.87
IFI	>0.90	0.97	0.92
CFI	>0.90	0.97	0.92
AGFI	>0.80	0.88	0.85

Table 2 Research questions testing results

RQ	Path	Path coefficient		Results	
		M'sia	USA	M'sia	USA
RQ1	AL → LA	−0.14**	−0.01	Yes	No
RQ2	CL → LA	−0.12	0.55**	No	Yes
RQ3	LA → LB	0.15**	−0.37**	Yes	Yes

**$p < 0.001$

Table 3 Mediation testing results

RQ	Country	Baron and Kenny (1986) test statistics				Mediation
		IV → DV, without M (β)	IV → M (β)	M → DV (β)	IV → DV, with M (β)	
RQ4	M'sia	0.89**	0.19**	−0.27**	0.96**	Partial
	USA	0.30**	−0.01 (ns)	−0.47**	0.25**	None
RQ5	M'sia	−0.48**	0.77**	−0.27**	−0.29**	Partial
	USA	−0.52**	0.65**	−0.47**	−0.20 (ns)	Full

**$p < 0.001$; *ns* not significant

Table 2 shows the results of the hypothesis testing of RQ1, RQ2 and RQ3 for the two samples. From the results, affective learning had a significant influence on LA ($\beta = -0.14$, $p < 0.0001$) for the Malaysian sample but not for the American sample. CL had a significant influence on LA ($\beta = -0.55$, $p < 0.001$) for the American sample but not for the Malaysian sample. However, learner awareness had a significant influence on LB for both samples with $\beta = 0.15$, $p < 0.001$ for the Malaysian sample and $\beta = -0.37$, $p < 0.001$ for the American sample. It is interesting to note that for the Malaysian students an increase in LB will increase LA. However, the opposite is true for the American sample, an increase in LA will decrease LB.

RQ4 tested the mediation effects of LA on the relationship between AL and LB. It was found that LA partially mediated the Malaysian model and did not mediate the US model. This finding is then further supplemented using the bootstrap method for testing indirect effects which indicated significant indirect effect of AL on LB through LA (CI: −0.17, −0.10), $\beta = 0.02$, $p < 0.001$ for the Malaysian model and insignificant (CI: −0.06, 0.05), $\beta = 0.002$ (ns) for the US model. That is learner awareness influenced both affective learning and learner behaviour for Malaysian students but not American students.

For RQ5, LA partially mediated the Malaysian model and fully mediated the relationship between CL on LB for the US model. The indirect effects of CL on LB through LA were significant for both the Malaysian model (CI: −0.05, −0.01), $\beta = -0.07$, $p < 0.001$ and US model (CI: −0.31, −0.12), $\beta = -0.30$, $p < 0.001$. Hence, cognitive learning and learner behaviour in Malaysian and American students, for these samples at least were influenced by learner awareness.

Limitations

There are some specific methodological limitations to the present study. Firstly, how and why students learned was measured using a self-report instrument, which was not context specific. However, there are differing points of view from researchers on this. Pintrich (2003) recommends adapting a questionnaire to suite the course rather than being overly global while Heikkilaa and Lonka (2006) recommend a more general and non-context driven questionnaire to measure student approach to learning. Because this study is explorative, cross-disciplinary and intercultural in nature, the LALQ used is suitable for students that come from various faculties and departments.

It must be noted that the data were collected from students of various faculties and programmes and many contextual aspects having to do with students' specific study culture were ignored. Further to this only students from one university for each of the countries were sampled. Future studies will need to look at the learning approaches of students from various social and cultural aspects which will be more contextual and grounded in the use of specific strategies. Attempts are also made to avoid interpretations of the data from the current study that will reflect seeing

approaches and strategies as trait-like entities. The interpretations are from a more systemic view and the approaches to learning in terms of the adaptations to a learning environment. This does not mean that students will exhibit similar predispositions across all learning environments, nor does it mean that it is unchangeable. Hence, there is clearly a need for experimental research to determine causality which cannot be made with the correlational evidence of the current study. Pintrich (2003) further encouraged more rigour in research methodologies, more reliable behavioural measures and developmental research. Hence, new methodologies and measuring instrumentation are needed, representing great opportunities for future studies.

Contributions of the Study

The knowledge obtained from this study will allow a deeper understanding of the needs of students from the Malaysian and American societies. It will also create a platform for mutual understanding of the uniqueness of the two cultures.

Conclusions

The results suggest that student approaches to learning for both the Malaysian and American samples were different. Learner awareness was influenced by affective learning for Malaysian students while for American students it was influenced by cognitive learning. This could be explained by the differences in cultural practices of the two countries. According to Picard (2004), affective learning is about the emotions involved in the process of learning. With Malaysia being a more collectivist society, the process of knowing 'how to do' hence how to develop a love of learning is more important (Hofstede 2001). For American students who are highly individualist, learning is a more cognitive process where the learning process needs to change with the context they are in Hofstede (2001), hence more likely to be seen as a coping mechanism.

Learner awareness partially mediated affective learning and cognitive learning on learner behaviour for Malaysian students. However, learner awareness fully mediated cognitive learning for American students. Hence for Malaysian students, learner awareness will have some influence on their approaches to learning resulting in changes in their learner behaviour. For American students, only cognitive learning influenced learner awareness resulting in changes to their learner behaviour. Therefore, for this sample at least, cognitive learning influenced learner awareness which in turn influenced the learner behaviour of American students. These findings seem to support research by Choi (2014) that the awareness of how one learns ultimately influence learner identity in terms of their behaviours which can be pivotal to students' academic future and choice of career.

References

Baron, R. M. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual strategic and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Bhagat, A., Vyas, R., & Singh, T. (2015). Students awareness of learning styles and their perceptions to a mixed method approach for learning. *International Journal of Applied & Basic Medical Research, 5*(Suppl 1), 58–65. doi:10.4103/2229-516X.162281

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & S. L. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage.

Busato, V., Prins, F., Elshout, J., & Hamaker, C. (2000). Intellectual ability, learning style, personality, achievement motivation and academic success of psychology students in higher education. *Personality and Individual Differences, 29,* 1057–1068.

Choi, T. (2014). Replacing the misplaced: Power, autobiography and learner identity. *Power and Education, 6*(1), 46–60.

Choy, S. C., Goh, S. C., & Sedhu, D. S. (2016). How and why students learn: Validation and development of the learner awareness questionnaire. *International Journal of Teaching and Learning in Higher Education, 28*(1), 94–101.

Entwistle, N. (2000). Some aspects of the teaching environment influencing approaches to studying. In *Edinburgh 2000 Group.* Edinburgh.

Flavian, H. (2016). Towards teaching and beyond: Strengthening education by understanding students' self-awareness development. *Power and Education, 8*(1), 88–100.

Hall, R. (2011). Affective assessment: The missing piece of the educational reform puzzle. *Marality in Education*, 7–10.

Heikkilaa, A., & Lonka, K. (2006). Studying in higher education: Students' approaches to learning, self-regulation, and cognitive strategies. *Studies in Higher Education, 31*(1), 99–117.

Hiew, W. (2012). English language teaching and learning issues in Malaysia: Learners' perceptions via Facebook dialogue journal. *Researchers World, 3*(1), 11–19.

Hofstede, G. (2001). *Culture's consequence*. London: Sage Publications.

Kember, D. (2000). Misconceptions about the learning approaches, motivation and study practices of Asian students. *Higher Education, 40*(1), 99–121.

Manavipour, D., & Saeedian, Y. (2016). The role of self-compassion and control belief about learning in university students' self-efficacy. *Journal of Contextual Behavioural Science, 5,* 121–126.

O'Connor, M. C., & Paunonen, S. V. (2007). Big Five personality predictors of post-secondary academic performance. *Personality and Individual Differences, 43,* 971–990.

Pallant, J. (2011). *SPSS survival manual*. London: Allen and Unwin.

Picard, R. W. (2004). Affective learning—A manifesto. *BT Technology Journal, 22*(4), 253–269.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. *Journal of Educational Psychology, 95*(4), 667–686.

Rassaei, E. (2015). Journal writing as a means of enhancing EFL learners' awareness and effectiveness of recasts. *Linguistics and Education, 32,* 118–130.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and non-experimental studies: New procedures and recommendations. *Psychological Methods*, 422–445.

The Effects of Task Demand and External Stimuli on Learner's Stress Perception and Job Performance

Yee Mei Lim, Aladdin Ayesh, Martin Stacey and Li Peng Tan

Abstract Over the past decades, research in affective learning has begun to take emotions into account, which advocates an education system that is sentient of learner's cognitive and affective states, as learners' performance could be affected by emotional factors. This exploratory research examines the impacts of mental arithmetic demand and external stimuli on learner's stress perception and job performance. External stimuli include time pressure and displays of countdown timer and clock on an online assessment system. Experiments are conducted on five different groups of undergraduate students, with a total of 160 of them from a higher learning institution. The results show that the impacts are significant. Correlations between task demand, external stimuli, learner's stress and job performance are also significant.

Keywords Clock · Demand · Performance · Stress · Time pressure · Timer

Introduction

Over the past decades, research in education has begun to take emotions into account, because of their influence on perception, reasoning, decision-making and learning (Landowska 2013; Sharples et al. 2015). If the factor that generates

Y.M. Lim (✉) · L.P. Tan (✉)
Faculty of Applied Sciences and Computing,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: ymlim@acd.tarc.edu.my

L.P. Tan
e-mail: tanlp@acd.tarc.edu.my

A. Ayesh · M. Stacey
School of Technology, De Montfort University, Leicester, UK
e-mail: aayesh@dmu.ac.uk

M. Stacey
e-mail: mstacey@dmu.ac.uk

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_10

negative emotion can be determined, teachers or e-learning developers can redesign the learning process, including adapting the instructions and improving the learning environment, to enhance student's attitude in learning. Similar to cognitive domain (Bloom and Engelhart 1956), Krathwohl et al. (1964) argued that affective objectives can also be divided into a hierarchy, which is concerned with feelings or emotions. The five major categories in this domain are listed from those simpler feelings to those that are more complex, i.e. receiving, responding, valuing, organizing and internalizing (Krathwohl et al. 1964). Although research in psychology and neuroscience reveals a tight connection between affect and cognition (O'Regan 2003), unfortunately many teachers often avoid including affective objectives in learning evaluation, stating that their areas of study are not emotional (Wilson 2015). To evaluate students' performance of a given assessment, it is very common that these teachers would only track the scores that the students obtained, nevertheless this is not enough. Emotions guide social interactions, influence decisions and judgments, affect basic understanding and can even control physical actions (Ssemugabi and de Villiers 2007).

Learning is not simply about acquiring knowledge. It is a complex process that involves mix of working memory organization, attention and cognitive control processes, which could be influenced by motivational and emotional factors. A non-conducive learning environment may induce negative emotion and high-stakes situation that generates stress, fear of failure, anxiety, or stereotype threat, which could lead to poor learning performance. For instance, from a research by Beilock and Ramirez (2011) that studied the relationship between emotion and cognitive control, they found that high-pressure and negative emotion-inducing situations significantly reduced student's maths performance. On flip side, when the students were placed under less emotion-inducing situations, they became more readily available for a more challenging job. Hence, negative emotion does not only inhibit appropriate cognitive resources that are necessary for optimal skill execution to be recruited by human mind, but it could also affect student's motivation for executing challenging task. Paas and Van Merriënboer (1994) also highlighted other influences that may affect cognitive load. These influences include causal and assessment factors. Causal factors involve the characteristics of the subject such as skills or expertise possessed, task complexity, environment such as noise, and their mutual relations. Assessment factors contain mental load, mental effort and performance. Hajcak et al. (2007) argued that the impact of negative emotion on performance decrement may be caused by the task demands itself or other external factors that are related to the task. Although there are lots of researches examining the relationships between causal and assessment factors, such as assessing how job demand impacts job performances, there is a lack of empirical research that examines the external emotion stimuli, such as timing factors, which may negatively impact students' emotion, behaviour and their learning outcomes.

Existing affective learning research adopted emotion defined by psychological research, e.g. the four quadrants of learning emotions as proposed by Kort et al. (2001), the positive and negative affect schedule (PANAS) scale by Watson et al. (1988), or Russell's Circumplex Model of Affect (Russel 1980). It may be

important to have a better understanding of granularity of emotion of learner so that teachers could identify positive valence such as interest and engagement, or negative valence of the learner, which impact learning performance. However, enabling measurement of rich granularity of emotion is extremely challenging. Picard et al. (2004) argued that affective state is hard to measure as there is lack of a clear theory that defines affects or emotions, which are constructs or conceptual quantities with fuzzy boundaries and with substantial individual difference variations in expression and experience, hence cannot be directly measured (Calvo and Mello 2010). The biggest challenge is to bring together research of theorists and practitioners from different fields, including psychology, neuroscience, physiology and social science, in order to refine the terminology with respect to affect and learning. Although there are research attempting to give clear dimension on emotion flourishes in many disciplines and specialties, experts cannot agree on its definition (Izard 2007). In viewing that measuring emotions in large scale is difficult, this study aims to measure only stress instead of other emotions. Stress can degrade reception and cause inefficient learning (LePine et al. 2004; O'Neil and Spielberger 1979). Detection of stress could be useful for affective computing developers to build effective e-learning that helps to identify the factors that cause ill learning behaviour, such as mismatched demand by the teachers, or frustrating resources, which brings negative effect to learning.

Literature Review

This section first presents the development of affective learning. It then defines stress related to learning based on existing literature. Lastly, the use of mental arithmetic problems in cognitive stress inducement is discussed.

Affective Learning

The term "affective" generally refers to the generation of an affect or emotional response (Rogers et al. 2007). The affective domain in learning was introduced by Krathwohl et al. (1964) for identifying, understanding and addressing how people learn. They categorized affective domain into 5 levels, namely receiving, responding, valuing, organizing and characterizing (Krathwohl et al. 1964). The study of affective learning has been gradually gaining popularity in the research pipeline in the aspect of formulating new teaching approaches, enhancing engagement in students' learning, as well as evaluating assessments and academic achievements (Shephard 2008). While most of the teaching, learning and assessment used in the education systems highly focus on assessing students' cognitive skills and knowledge, affective domain advocates the students not only to receive,

but also to respond, value, organize and even internalize the value or value set of what they have learned. In addition, Smith and Ragan (1999) added that affective domain should focus on three main educational theories, which are values, attitudes and behaviours. It is found that students with the correct values, positive attitudes and right behaviours make the most integral part of successful learning (Jagger 2013). Various students-centred teaching strategies and approaches have been suggested or transformed overtime, including the incorporation of emotional support (Slavich and Zimbardo 2012).

Much recent research in education has taken emotions into account during teaching, learning and assessment, because their influence in perception, reasoning, motivation, decision-making and learning, hence evolving pedagogy to enhance personalized learning (Anania 1981; Kort et al. 2001; Kort and Reilly 2002; Landowska 2013; O'Neil and Spielberger 1979; Picard et al. 2004; Sharples et al. 2015; Shen et al. 2009; Sloan et al. 1991). For instance, Baker et al. (2010) found that the factors that cause learning problem and problematic behaviour could be due to boredom and confusion, and the factor for better learning is engaged concentration. Hence, it is definitely not enough for the teacher to assess the performance of the learners by merely tracking the number facts, such as frequency of activities, number of posts and marks obtained. If the teacher is unaware of the motivational problems of the learners and the factors that cause the students to behave so, then the teacher may not be able to foster the learner's concentration, or to improve his or her future performance. By discovering the factor that endangers learning, teachers or e-learning developers could adapt the content to re-engage the learner's concentration in the subsequent challenging learning experience. However, many teachers consider affective learning complex and rather confusing as it is found overlapping with other domains (Reigeluth 2013).

Stress and Stress Measurement

The term "stress" was first coined by Selye (1946, 1956) in his earlier endocrinological research. Although his original work was unrelated to psychological or educational research, his classification of stress into eustress, understress, overstress and distress, is meaningful as each can positively or negatively affect learning. Eustress is a kind of good stress that motivates a person to thrive for greater achievements. Understress creates a very negative effect that often results in boredom, fatigue and dissatisfaction. Overstress occurs when one pushes himself or herself beyond his/her limits, which leads to the state of fight or flight. Distress involves unresolved negative feelings of fear, anxiety and frustration, which build psychological barriers to further learning. Although Selye argued that stress can be good or bad, most people viewed stress as some unpleasant threat and was generally considered as being synonymous with distress (http://www.stress.org/what-is-stress). Oxford dictionaries (2016) define stress as

"a state of mental or emotional strain or tension resulting from adverse or demanding circumstances". Lazarus and Folkman (1984) define stress as "a feeling experienced that a person perceives that demands exceed the personal and social resources the individual is able to mobilize", which concerned primarily on human emotion and feeling of stress. Besides, LePine et al. (2004) found that stress associated with challenges had a positive relationship with learning performance, and that stress associated with hindrances had a negative relationship with learning performance in a learning environment. They also suggested that these stress-learning performance relationships were partially mediated by exhaustion and motivation to learn. O'Neil and Spielberger (1979) argued that serious stress and strain, degrade reception and inefficient learning could be caused by learner's limited memory, attention span or decision-making capabilities despite having strongest motivation. On the other hand, Weinberg et al. (2013) suggested that when the context of the emotion stimuli is not relevant to the task, such as seeing a picture of a crying face before solving an arithmetic problem, people may demonstrate little-to-no impact on the task. In other words, the effects of the stress stimuli on cognitive process may depend on both of the attentional demands of the task and the salience of the stimuli (Hajcak et al. 2007). It is important to understand that the impact of emotion on performance is related to the task. Accordingly, the stressors that are induced during the experiments would focus on the task demand and timing factors that may affect student's stress perception and performance, such as time pressure and displays of countdown timer and clock.

The challenge for us to measure stress is to determine solid constructs that can quantify the strength of stress. Objective measures can consist of the task demand strength, available resources such as time duration, influence of external stress stimuli such as unpleasant environment, and physiological data such as blood pressure and cortisol measurements. Some psychological theories found that in a task-specific environment, user stress levels can be varied according to two factors: demand and control (Karasek 1979). Excessive demand such as meeting a deadline and lack of control over workplace processes could significantly affect worker production. Liao et al. (2005) compares the inferred stress level against job demands through visual features, physiological, behavioural and performance evidences. Their experiments show that the inferred user stress level by their system is consistent with that predicted by Karasek. However, using those above-mentioned objective measures cannot have the relevance and power of direct reporting of feelings about stress, hence it is particularly difficult to find objective criteria against which to validate self-report measures of stress (Crandall 1976). For instance, two individuals could have different stress perception even they are given the same task demand and resources, dependent on how much the individual can tolerant with the stress. If stress is considered as a kind of emotion that is subjective to human perception towards a task demand, then self-report survey is an important tool for the preliminary research that requires large amount of samples.

Mental Arithmetic and Cognitive Load

A study by Imbo and Vandierendonck (2007) reveals that larger numbers and borrow operations in arithmetic problems involve longer sequences of steps and require maintenance of more intermediate products, hence place greater demands on human working memory. If a task demand is beyond the working memory capacity and temporal limitations, then the task may be perceived too challenging (Sweller et al. 2011). Accordingly, mental arithmetic problems under time pressure are widely used in experiments to induce cognitive stress (Owen et al. 2005; Setz et al. 2010; Sloan et al. 1991). However, although some existing research have explored how attention, memory and computational processes support arithmetic calculations, there is a lack of work that addresses how emotion, such as stress, could affect the mental arithmetic performance in return. Beilock and Ramirez (2011) argued that stressful and emotion-inducing situations could lead to unwanted performance degradation even for relatively simple calculations in math performance. It is believed that negative emotion could prevent or inhibit the recruitment of the appropriate cognitive resources necessary for optimal skill execution. Therefore, this research aims to study the impact of emotion stress, induced by diverse mental arithmetic demand, on learners' math performance.

Research Problem

Two main research problems have been identified. First, there is a lack of affective learning research that studies the effects of task demand and external psycho-physiological stimuli on learners' stress perception and their task performance. Second, although many psychological studies believe that unpleasant environment creates unnecessary stress to learners and affects their performances, nevertheless there is less experimental research that proves the effects of timer and clock displays to the students during assessment. To stimulate task demand pressure on learners, we introduce mental arithmetic problems. External stimuli are included by imposing a time constraint, with a display of a digital clock that is updated every second and/or a display of countdown timer that flashes every second during the mental arithmetic task.

Objectives of the Study

The main objective of the research is to study the effects of task demand and external stimuli, such as time pressure, clock display and timer display, on learners' stress perception and their task performance. If the effects are found significant,

then the correlations of task demand and external stimuli to stress perception and job performance will be examined.

Research Methodology

Ten different mental arithmetic problems with different complexity are given to the students within a mock-up of an online assessment system (see Table 1). The task demand (Demand) is elevated from Questions 1 to 10 according to the increment of number of digit per number and the amount of numbers in the question. Each question is displayed on different individual Web pages. The students must answer all questions by doing mental arithmetic and must type the answer into a designated textbox on each page. No calculator or calculation on paper is allowed.

The students are divided into 5 groups. The groups are named following the code system below:

Timing (0 or 1) + Clock (0 or 1) + Timer (0 or 1)

The 5 experiment groups' settings are as follows:

Group 000: It is the first control group, who are required to complete all 10 questions without any time constraint. They are required to click the *Save* button in order to proceed to the next question. There is no clock display or countdown timer.
Group 100: It is the experimental group where there is neither clock nor countdown timer display, but given 30-s time constraint.
Group 101: It is the experimental group where there is a countdown timer that flashes every second with yellow background.
Group 110: It is the experimental group where there is no countdown timer but a digital clock that displays the current date and time (which is updated every second).

Table 1 Mental arithmetic problem and demand

Task	Max digit in number	Amount of number	Arithmetic problem
1	1	2	6 + 2
2	1	2	9 * 4
3	1	3	6 * 5 − 1
4	1	3	(8 + 9) * 2
5	2	3	7 – 8 * 10
6	2	4	58 + 20 * (8 − 6)
7	2	4	67 – 2 * (4 + 2)
8	3	5	(880 + 12 + 50 − 520) * 2
9	3	5	105 + 83 * 5 – 3 * 60
10	3	5	561 – 81 * 5 + 3 * 610

Group 111: This experimental group is able to see both clock display that is updated every second and a countdown timer that flashes continuously in yellow background.

For all the experimental groups (100–111), the participants must complete each question within 30 s. Each question will be submitted automatically once the time is up, if it is not done by the student earlier. All participants are required to run the experiments in a computer laboratory. All the computers in the laboratory were equipped with Windows 7, 3.10 GHz CPU, 4 GB RAM, 17″ monitor with the resolution of 1024 × 768 pixels, external standard QWERTY HID keyboard and external HID-compliant mouse. The website runs on Google Chrome by default. Before they started the assessment, instructions are displayed on the screen and they must provide their consensus in order to continue the experiments. The participants can click on the *Give Up* button if they wish to give up a task. Each time the student starts a question, the task performance will be captured by the system automatically. Task performance consists of the time duration spent on the question (in milliseconds, scaled with $\log_{10}$ function) (*TD*), errors made (*Err* = 1 if answer is wrong, else 0), attempt to give up (*GU* = 1 if the participant gave up the question, otherwise 0) and passive attempt to wait till the time is up (*PA* = 1 if the student did not manage to submit before the time is up, otherwise 0). *TD* is computed from the moment when the question is displayed until the answer is submitted. Each time after the students completed a question, or skipped the question, a self-report survey is displayed as follows:

"You felt stressed when answering the previous question"

This survey enables them to assess their stress perceptions when solving the arithmetic problem, following 7-point Likert scale (1 for strongly disagree, 7 for strongly agree). Therefore, this provides us the subjective measurement of the user's stress perception, *SP*.

Results/Discussions

The experiments were conducted within 2 weeks with three different groups of bachelor degree year-2 students, who are from computer science, information system and information technology programmes. A total of 160 participants voluntarily took the tests. The majority of them were male (88.75%). We received 30 participants from Group 000, 34 from Group 100, 31 from Group 101, 35 from Group 110 and 30 from Group 111.

Univariate analysis of variance (ANOVA) tests are done to study the effects of Demand, Timing, Clock and Timer on *SP*. We tested the effects of the factors on task performance using multivariate analysis of variance (MANOVA) tests. The results in Table 2 show that the effects of the factors on *SP* and task performance are significant. Spearman correlation tests are conducted to assess the correlations of Demand and the external stimuli, i.e. Timing, Clock and Timer, to stress

Table 2 Analysis of variance tests between task demand and external stimuli effects on *SP* and performance

Factor	Group	*p*(*SP*)	Task performance				
			p	*TD*	*Err*	*PA*	*GU*
Demand	All	**$6e^{-122}$**	**0**	**$5e^{-197}$**	**$6e^{-199}$**	$8e^{-63}$	**$7e^{-12}$**
Timing	000, 100	**$4e^{-3}$**	**$5e^{-19}$**	**$3e^{-4}$**	**$8e^{-8}$**	**$3e^{-9}$**	0.07
Clock	Timing = 1	**0.015**	**$5e^{-6}$**	**0.02**	**$2e^{-5}$**	0.06	0.35
Timer	Timing = 1	**$1e^{-6}$**	**$3e^{-7}$**	0.10	**$1e^{-5}$**	**$2e^{-3}$**	0.10
Demand * timing	000, 100	**0.036**	**$2e^{-20}$**	0.14	$1e^{-5}$	**$2e^{-16}$**	0.18
Demand * clock	Timing = 1	**0.005**	0.320	0.23	0.13	0.14	0.99
Demand * timer	Timing = 1	0.518	**$1e^{-5}$**	**$2e^{-8}$**	**0.04**	**$4e^{-3}$**	0.47
Timer * clock	Timing = 1	**0.017**	0.05	0.36	0.40	0.06	0.77

Effect is significant at $p < 0.05$ (2-tailed) level if it is bolded

perception *SP* and task performance. Spearman correlation is suitable to evaluate the relationships involving ordinal variables such as Demand and stress stimuli, or continuous variables such as *SP* (Gravetter and Wallnau 2015). The correlations results are shown in Table 3. As expected, increase of task demand results in higher stress perception (*SP*), time duration (*TD*), answer error (*Err*), passive attempt (*PA*) and give up attempt (*GU*). Time constraint (Timing) leads to more *Err* and *PA,* but interesting lower *SP*. Although time pressure is a kind of stressor that can increase physio-psychological reaction (Wahlström et al. 2002), nevertheless the increment

Table 3 Correlations between task demand, external stimuli, *SP* and performance

Factor		*SP*	Task Performance			
			TD	*Err*	*PA*	*GU*
Demand	*r*	0.528	0.645	0.615	0.342	0.179
	p	**$2e^{-115}$**	**$8e^{-189}$**	**$7e^{-167}$**	**$4e^{-45}$**	**$6e^{-13}$**
Timing	*r*	–0.099	–0.075	0.152	0.206	–0.072
	p	**0.013**	0.058	**$1e^{-4}$**	**$2e^{-7}$**	0.071
Clock	*r*	–0.055	0.051	–0.088	0.049	0.025
	p	**0.046**	0.068	**0.002**	0.079	0.373
Timer	*r*	0.106	–0.024	0.090	–0.077	0.045
	p	**$1e^{-4}$**	0.379	**$1e^{-3}$**	**0.006**	0.109
SP	*r*	1.000	0.434	0.413	0.265	0.143
	p		**$1e^{-74}$**	**$6e^{-67}$**	**$4e^{-27}$**	**$8e^{-9}$**
TD	*r*	0.434	1.000	0.328	0.428	–0.051
	p	**$1e^{-74}$**		**$2e^{-41}$**	**$3e^{-72}$**	**0.040**
Err	*r*	0.413	0.328	1.000	0.373	0.205
	p	**$6e^{-67}$**	**$2e^{-41}$**		**$6e^{-54}$**	**$1e^{-16}$**
PA	*r*	0.265	0.428	0.373	1.000	–0.043
	p	**$4e^{-27}$**	**$3e^{-72}$**	**$6e^{-54}$**		0.083
GU	*r*	0.143	–0.051	0.205	–0.043	1.000
	p	**$8e^{-9}$**	**0.040**	**$1e^{-16}$**	0.083	

Effect is significant at $p < 0.05$ (2-tailed) level if it is bolded. Highlighted cell indicates negative correlation coefficient, *r*

of stress level is also dependent on the sense of control that resides in individual's mind (Karasek 1979). Compared to Group 000, the students who were given time constraint may have better sense of control, as they could estimate the time resource needed to complete the task. The effect of time pressure will be less acute as long as the students perceive that the resource they have is enough for the task. We also found that there is no correlation between external stimuli and *TD* that can be observed. *GU* is also not affected by the external stimuli. It is also interesting to note that when *SP* rises, *Err*, *PA* and *GU* also increase. Timer display increases *SP* as well as *Err*. Surprisingly clock does not appear as a stress stimulus but instead it reduces *SP* as well as *Err*.

We looked at research on the influence of clocks and timers on human behaviour. Burle and Casini (2001) studied how physiological arousal affects the rate of an internal pacemaker and the way attention affects time estimation. A number of diverse observations indicate that arousal manipulations can change the rate of the pacemaker of an internal clock (Penton-Voak et al. 1996). In short, increased attention to time by showing them a clock or a timer and an increase in physiological arousal, such as under time pressure can lead to different time estimations. However, misestimate of duration in emotional situations can occur, and it is difficult to decide which mechanism, whether it is the attention raised or the induced physiological arousal, actually affects the sense and direction of time duration (Wittmann 2009). Compared to those who have no idea about the remaining time, the clock display may help the learners to estimate time and hence control their pace, which might lower their stress perception. For those who are given a countdown timer that flashes every second, it does not only increase attention to time, but it might also create additional physiological arousal, i.e. stress, on top of the given time pressure.

Contributions of the Study

These findings have two key implications for educators. First, our results are aligned with a lot of existing affective learning research, which studies stress significant effects on learners' job performance. Therefore, it is very important for teachers to consider the learners' emotion during assessment, teaching and practice in order to help them to achieve better performances. Secondly, we found that external stimuli such as time constraint and timer display reduce job performance as expected, but imposing time limit on the task does not necessarily increase stress perception. We recommend examiners as well as examination software to display clock to the students instead of a timer during the assessment.

Conclusions

From the research, we found significant effects of task demand and external stimuli, such as time pressure, clock display and timer display, on learners' stress perception and their task performance. We also found some correlations between these variables. Stress perception is affected when task demand increases, and when external stimulus such as timer display is introduced. Significant correlations between stress perception and job performance indicate that when stress level rises, the learners' performance becomes worse. Accordingly, we advocate all teachers whenever having to assess a student's performance, besides considering the marks that the student achieves, they should assess the values, attitudes, behaviours that the student develop in learning, as well as to evaluate the emotion such as stress that he or she experienced during the assessment. Besides, it is vital to provide time information during the test for the students' reference, which allows them to generate optimal plan and strategies to complete the test based on the time resource they could estimate. Despite interesting effects and correlations of task demand and external stimuli to stress perception and job performance are found, the factors that affect time estimates and stress perception are still incompletely understood by the existing psychology and neuroscience research. In our experiments, the timer versus clock is conflated with invasive and distracting flashing. There is no significant evidence from the study for the hypothesis that timers are more stressful than clocks. Furthermore, the experiments were conducted on different sessions, which students' stress perception and job performance could be affected by external factors that we could not control, such as they were already tired after having a long day of class. Therefore, more empirical research need to be conducted in the future to study the relationship between clock, timer, stress and job performance under controlled environment with salient design of the stimuli.

References

Anania, J. (1981). *The effects of quality of instruction on the cognitive and affective learning of students*. University of Chicago.

Baker, R. S. J., D'Mello, S. K., Rodrigo, M. M. T., & Graesser, A. C. (2010). Better to be frustrated than bored: The incidence, persistence, and impact of learners' cognitive—Affective states during interactions with three different computer-based learning environments. *International Journal of Human-Computer Studies, 68*(4), 223–241.

Beilock, S. L., & Ramirez, G. (2011). On the interplay of emotion and cognitive control: Implications for enhancing academic achievement. *Psychology of Learning and Motivation-Advances in Research and Theory, 55,* 137.

Bloom, B. S., & Engelhart, M. D. (1956). In W. H. Hill, E. J. Furst, & D. R. Krathwohl (Eds.), *Taxonomy of educational objectives: The classification of educational goals; Handbook I: Cognitive domain*. Longman.

Burle, B., & Casini, L. (2001). Dissociation between activation and attention effects in time estimation: Implications for internal clock models. *Journal of Experimental Psychology: Human Perception and Performance, 27*(1), 195.

Calvo, R. A., & Mello, S. D. (2010). Affect detection: An interdisciplinary review of models, methods, and their applications. *IEEE Transactions on Affective Computing, 1*(1), 18–37.
Crandall, R. (1976). Validation of self-report measures using ratings by others. *Sociological Methods & Research, 4*(3), 380–400.
Gravetter, F., & Wallnau, L. (2015). *Statistics for the behavioral sciences* (10th ed.). Cengage Learning. Retrieved from https://books.google.com.my/books?id=ZCNTCwAAQBAJ
Hajcak, G., Dunning, J. P., & Foti, D. (2007). Neural response to emotional pictures is unaffected by concurrent task difficulty: An event-related potential study. *Behavioral Neuroscience, 121* (6), 1156.
Imbo, I., & Vandierendonck, A. (2007). Do multiplication and division strategies rely on executive and phonological working memory resources? *Memory & Cognition, 35*(7), 1759–1771.
Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemas, and a new paradigm. *Perspectives on Psychological Science, 2*(3), 260–280.
Jagger, S. (2013). Affective learning and the classroom debate. *Innovations in Education and Teaching International*, *50*(1).
Karasek, R. A. (1979). Job demands, job decision latitude and mental strain: Implications for job design. *Administrative Science Quarterly, 24,* 285–308.
Kort, B., & Reilly, R. (2002). Analytical models of emotions, learning and relationships: Towards an affect-sensitive cognitive machine. In *Conference on Virtual Worlds and Simulation (VWSim 2002).*
Kort, B., Reilly, R., & Picard, R. W. (2001). An affective model of interplay between emotions and learning: Reengineering educational pedagogy-building a learning companion. In *Proceedings of IEEE International Conference on Advanced Learning Technologies, 2001* (pp. 43–46).
Krathwohl, D. R., Bloom, B. S., & Masia, B. B. (1964). *Taxonomy of educational objectives, handbook II: Affective domain*. New York: David McKay Company Inc.
Landowska, A. (2013). Affective computing and affective learning—Methods, tools and prospects. *Stara Strona Magazynu EduAkcja, 5*(1).
Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. Berlin: Springer Publishing Company. Retrieved from https://books.google.co.uk/books?id=i-ySQQuUpr8C
LePine, J. A., LePine, M. A., & Jackson, C. L. (2004). Challenge and hindrance stress: Relationships with exhaustion, motivation to learn, and learning performance. *Journal of Applied Psychology, 89*(5), 883.
Liao, W., Zhang, W., Zhu, Z., & Ji, Q. (2005). A real-time human stress monitoring system using dynamic bayesian network. In *Proceedings of the 2005 IEEE Computer Society Conference on Computer Vision and Pattern Recognition* (p. 70).
O'Neil, H. F., & Spielberger, C. D. (1979). *Cognitive and affective learning strategies*. Cambridge: Academic Press.
O'Regan, K. (2003). Emotion and E-learning. *Journal of Asynchronous Learning Network, 7*(3), 78–92.
Owen, A. M., McMillan, K. M., Laird, A. R., & Bullmore, E. (2005). N-back working memory paradigm: A meta-analysis of normative functional neuroimaging studies. *Human Brain Mapping, 25*(1), 46–59.
Oxford Dictionaries. (2016). *Stress*. Retrieved March 30, 2016, from http://www.oxforddictionaries.com/definition/english/stress
Paas, F. G. W. C., & Van Merriënboer, J. J. G. (1994). Instructional control of cognitive load in the training of complex cognitive tasks. *Educational Psychology Review, 6*(4), 351–371.
Penton-Voak, I. S., Edwards, H., Percival, A., & Wearden, J. H. (1996). Speeding up an internal clock in humans? Effects of click trains on subjective duration. *Journal of Experimental Psychology: Animal Behavior Processes, 22*(3), 307.
Picard, R. W., Papert, S., Bender, W., Blumberg, B., Breazeal, C., Cavallo, D., et al. (2004). Affective learning—A manifesto. *BT Technology Journal, 22*(4), 253–269.
Reigeluth, M. C. (Ed.). (2013). *Instructional-design theories and model. A new paradigm of instructional theory* (Vol. 2). Routledge.

Rogers, Y., Sharp, H., & Preece, J. (2007). *Interaction design: Beyond human-computer interaction* (2nd ed.). West Sussex: Wiley.

Russel, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39*(6), 1161–1178.

Selye, H. (1946). *Stress in health and disease*. Butterworth.

Selye, H. (1956). *The stress in life*. McGraw-Hill.

Setz, C., Arnrich, B., Schumm, J., La Marca, R., Troster, G., & Ehlert, U. (2010). Discriminating stress from cognitive load using a wearable EDA device. *IEEE Transactions on Information Technology in Biomedicine, 14*(2), 410–417.

Sharples, M., Adams, A., Alozie, N., Ferguson, R., FitzGerald, E., Gaved, M., et al. (2015). *Innovating pedagogy 2015*. Milton Keyne.

Shen, L., Wang, M., & Shen, R. (2009). Affective e-Learning: Using "emotional" data to improve learning in pervasive learning environment. *Educational Technology & Society, 12*(2), 176–189.

Shephard, K. (2008). Higher education for sustainability: Seeking affective learning outcomes. *International Journal of Sustainability in Higher Education*.

Slavich, G. M., & Zimbardo, P. G. (2012, December). Transformational teaching: Theoretical underpinnings, basic principles, and core methods. *Educational Psychology Review*.

Sloan, R. P., Korten, J. B., & Myers, M. M. (1991). Components of heart rate reactivity during mental arithmetic with and without speaking. *Physiology & Behavior, 50*(5), 1039–1045.

Smith, P. L., & Ragan, T. J. (1999). *Instructional design*. New York: Wiley.

Ssemugabi, S., & de Villiers, R. (2007). A comparative study of two usability evaluation methods using a web-based e-learning application. In *Proceedings of the 2007 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in Developing Countries* (pp. 132–142). New York, NY, USA: ACM.

Sweller, J., Ayres, P., & Kalyuga, S. (2011). *Cognitive load theory* (Vol. 1). Berlin: Springer.

Wahlström, J., Hagberg, M., Johnson, P. W., Svensson, J., & Rempel, D. (2002). Influence of time pressure and verbal provocation on physiological and psychological reactions during work with a computer mouse. *European Journal of Applied Physiology, 87*. Berlin: Springer. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12111287

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063–1070.

Weinberg, A., Ferri, J., & Hajcak, G. (2013). Interactions between attention and emotion. *Handbook of Cognition and Emotion*, 35.

Wilson, L. O. (2015). *Three domains of learning-cognitive, affective, psychomotor*. Retrieved from http://thesecondprinciple.com/instructional-design/threedomainsoflearning

Wittmann, M. (2009). The inner experience of time. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 364*(1525), 1955–1967.

How Does Inquiry-Based Instruction Affect Learning in a Secondary School Science Class?

Tze Jiun Lee, Nurzatulshima Kamarudin, Othman Talib and Aminuddin Hassan

Abstract This study used a quasi-experiment with pretest–post-test design (quantitative) to compare thinking skills achievement tests of students who practise structured-inquiry-laboratory practices (St-IQL) and students who only receive classroom teaching (CT) using two biology chapters in secondary schools. Two classes of Form 4 students (n = 64) from two public secondary mixed schools in Kuala Lumpur, Malaysia, were selected for the study. Higher and lower order thinking skills questionnaires (suggested by Bloom) were handed out in the pretest and post-test. The post-test was administered after both classes had done the treatments, respectively (8 weeks), in order to evaluate the level of students' thinking skills of biology concepts. The students who were exposed to St-IQL treatment achieved higher post-test mean scores than those who were exposed to CT method. A small effect size (partial eta squared) of 0.23 suggests that 23% of the variance in the post-test scores was related to the differences in the instructional methods.

Keywords Biology · Constructivism · Inquiry · Laboratory · Practical · Science

Introduction

The Curriculum Development Centre under the Ministry of Education Malaysia emphasizes few instructional approaches in implementing higher order thinking skills (HOTS) pedagogy; they are inquiry-based learning, constructivism, contextual-based learning, project-based learning and future studies. Biology, being

T.J. Lee (✉)
Centre for Pre-University Studies, Tunku Abdul Rahman University College, Setapak, Malaysia
e-mail: june_le80@yahoo.com

N. Kamarudin (✉) · O. Talib · A. Hassan
Faculty of Educational Studies,
Universiti Putra Malaysia, Seri Kembangan, Malaysia
e-mail: nzshima@upm.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_11

the leading field of science in the modern world, is constantly in a state of flux and new discovery. Science can be attributed to constructivism and inquiry-based learning approaches that seem suited to students who desire to attain scientific skills, manipulative skills and higher order thinking skills (Liu and Lee 2013). Despite the positive implications of these approaches, science teachers in Malaysia generally change their instructional styles from time to time from a teacher-centred to more hands-on student-centred, inquiry-based, problem-based learning and higher order thinking approach (Hiong and Osman 2013; Lee and Kamarudin 2014; Tan and Halili 2015).

Confirmation, Structured, Guided and Open Inquiry Approaches

Inquiry encourages learning in constructivism context, emphasizing that the learner constructs their own ideas from what he has already known with the new knowledge or experiences acquired to form what is known as absolute higher order thinking, i.e. ingenious learner (Hiong and Osman 2013; National Research Council 2000). The level of inquiry-based learning and teaching's successful assimilation is dependent on how much a teacher holds the autonomy to conduct a lesson or how much freedom that a student has from his teacher to conduct his activities (National Research Council 2000). There are four levels of inquiry, from the lowest to the highest:

1. *Confirmation Inquiry*
   The lowest level of inquiry-based learning is based on verification of laws and theories where the teacher wishes to train students with observational skills, conducting experiment and analytical skills. Students follow instructions where questions, procedures and solutions are all defined by their teacher alone (Trna et al. 2012). The confirmation of inquiry also needed students to confirm or justify ideas or results through predicted answers and steps that are given to the students to follow (Mumba et al. 2007; Simandi and Vamcek 2015).
2. *Structured Inquiry*
   Teacher poses questions to students with procedures including step-by-step instructions, guiding students towards known outcomes. Nevertheless, students would have to proceed with hands-on exploration in science process and cultivate their skills of inquiry, such as formulating hypotheses, doing observation, data collecting and arranging results, making conclusions, drawing inferences and looking for alternatives (Zion and Mendelovici 2012). This has become a popular type of instructional teaching transmitted to the students, and also a common practice that is being administered in laboratories (Zion et al. 2007). The structured inquiry works best when a teacher wishes to develop fundamental inquiry skills of students who lack an appreciation for the nature of science, where procedures and

outcomes are 'known in advance' (Sadeh and Zion 2009; Zion and Mendelovici 2012).

3. *Guided Inquiry*
   Teacher still provides research questions and procedures and the students need to work as a team, collecting data, analysing them and developing solutions, but the teacher and students are not well adjusted to predict the outcomes (Zion et al. 2007). This type of inquiry revolves around a higher level of inquiry approach than structured inquiry. According to NRC (2000, p. 108), '*guided inquiry is essential at the introductory level so that the students can later use their developing knowledge and conceptual understanding to dig more deeply into the key ideas of physical science*'. The students and teachers are not well-adjusted to predict the outcomes, which lead the students to form more questions of an inquiry kind, hence prompting them to take more responsibility in making decisions after data collection (Zion and Mendelovici 2012). With proper and effective guidance, students are able to construct new ideas in the inquiry process and procedures, thus increasing their own understanding and transferable skills (Kuhlthau 2010).
4. *Open Inquiry*
   The highest and most challenging level of inquiry-based learning is where students decide the problem, create the hypothesis, engage with decision-making and develop their own research (Zion et al. 2007). The open inquiry necessitates higher order thinking skills to be capable of independently forming questions, designing own experiment, expository and well thought out ability (Zion and Mendelovici 2012).

Learning Science

Malaysia Education Blueprint urging that Science, Technology, Engineering and Mathematics (STEM) should be transmitted throughout our educational system. They emphasized that '*A drop in interest in Science subjects may stunt efforts to improve technological innovations to make Malaysia a high income nation*' (Malaysia Education Blueprint 2013–2025 2013, p. 4–7). Under the science curriculum outlined by Malaysian's Ministry of Education (MOE), students are required to study some core subjects from Form One to Form Three, or otherwise known as lower secondary education. Upon completion of the lower secondary education, students are given the option to proceed in science stream via upper secondary education which required them to take at least two pure science subjects for the Malaysian Certificate of Education. The pure science subjects are biology, chemistry and physics (Malaysia Education Blueprint 2013–2025 2012).

MOE's continuous efforts in improving our quality of students' outcomes towards STEM culminated in the Ministry and its team working hand in hand with Southeast Asian Ministers of Education Organisation Regional Centre for

Education in Science and Mathematics (SEAMEO-RECSAM), to identify the obstacles faces among STEM educators regarding the content knowledge, curriculum and pedagogical skills in order to efficaciously formulate MOE's new curriculum concepts and transmit them for practical application (Malaysia Education Blueprint 2013–2025 (Preschool to Post-Secondary Education) 2013). Effective instructional tool of science teaching will impact the students' academic achievement towards a better outcome over students who are not accorded the same experience. That withstanding, the effective instructional tools' successful utilisation relies heavily on various factors such as teacher's default learning and teaching styles, students' learning styles, accessibility of school facilities, schools' administrative system, national educational blueprint and others factors in order to evaluate students' higher order thinking skills, critical thinking, test scores, scientific skills and levels of student's motivation (Abdi 2014; Johnson et al. 2012; Miri et al. 2007; Tuan et al. 2005).

Due to the urgency of restructuring the government secondary education system, the new curricular modules, especially in science, no longer employ a sole focus on student's content knowledge, but will now give higher priority to expanding student's critical thinking, hypothesizing and making interpretation skills which is in line with the goal of developing higher order thinking skills students, thereby shaping the nation's future workforce (Malaysia Education Blueprint 2013–2025 2013). For STEM, prolonged teaching hours and more hands-on practices through laboratory or project-based work are among the alternatives in enhancing students' higher order thinking skills (Malaysia Education Blueprint 2013–2025 2013).

For more than a decade, science teachers have been struggling with constraints and limitation to enhance their students' higher order thinking skills (HOTS) in the context of scientific understandings (Saat and Ismail 2003; Yunus et al. 2004). Tan and Halili (2015) summarized that there are few factors that makes HOTS not teachable or cannot deliver it effectively by the teachers: 1. Time—the use of time for students to feedback, to familiar with, to socialize with, make discussion, questioning and others at the same time. 2. Students' mentality—Students prefer being provided a direct solution to solve a problem instead of asking them to think and solve a problem by themselves. 3. Teacher lack of knowledge—Teachers may have different definitions to teach HOTS and also lack of understanding about HOTS as well. 4. Assessments—Teachers used fixed protocol given by authorities to teach HOTS which restricted them to teach HOTS effectively for different subjects. As such, hands-on laboratory practices had been recognized and suggested to be a timely alternative to delivering science inquiry-based learning based on constructivism in order to achieve the objectives set (Hafizan et al. 2012; Hiong and Osman 2013; Pandian and Balraj 2010; Sim and Arshar 2010). Basically, students who practise inquiry-based learning in a laboratory should be more independent, less dependent on their teacher's instruction, embrace active learning, able to discover their potential and be more connected to the world outside (Brickman et al. 2009; Voogt et al. 2009). The students are able to enhance their team spirit, ability to perform in any task given and demonstrating high participation in the given task.

This enables the students to communicate well and learn better when practicing inquiry-based in group work (Dkeidek et al. 2012).

The reintroduction of the Malaysian Certificate Education practical testing elements in national examinations after being postponed for 16 years is seen as one of the ambitious moves to upgrade our science education system. Conducting laboratory experiments facilitates students in accumulating scientific skills in a more proper environment or set-up, which cannot be achieved by theoretical learning alone, a salient point agreed by researchers from all around the world (Dika and Sylejmani 2012; Pich-Otero and Molina-Ortiz 1998).

Purpose

This study used a quasi-experiment with pretest–post-test design to compare the thinking skills achievement tests (quantitative) of students who practise structured-inquiry-laboratory practices (St-IQL) and students who only receive classroom teaching (CT). The research question is as follows:

1. Is there a difference in thinking skills test scores of biology concepts between St-IQL and CT groups?

Method

Subjects

Two classes of Form 4 students (16-year-old) (n = 64) from two mixed public secondary schools in Kuala Lumpur, Malaysia, were selected for the study. Both these classes were found to exhibit similar academic knowledge on the biology concepts having gone through a pretest given to them before the commencement of the research. One class was selected as the experimental class to experience laboratory practices and classroom teaching (St-IQL) while the other was chosen as a control class restricted to classroom teaching without any laboratory practices (CT).

Instruments

Higher and lower order thinking skills questionnaires (quantitative) were handed out in the pretest and post-test. The questionnaires were adapted from past years' Biology Paper 3 of the Malaysian Certificate Education as suggested by the Bloom taxonomy. Students' answers were marked according to the past year questions' marking scheme by the researcher to ensure a fair evaluation of the marks. The pretest was conducted to identify the students' existing knowledge level of the two

topics in their syllabus which are (i) movement of substances across the plasma membrane and (ii) chemical composition of the cell (enzyme).

Then, the post-test was administered after 8-week treatments. The time required for completing the test ranged from 45 to 60 min. As the questions were adapted from national past years' questions, the content validity is deemed checked. Time inadequacy for the students to answer all the questions and ponder over probable confusing written instructions on the test papers was among the worrisome considerations that could complicate the pilot test.

Notwithstanding, content validity was checked by two experts: a lecturer with a background in science education (Tunku Abdul Rahman University College) and a biology teacher (SMK Wangsa Maju Sec 2), both recording a teaching capacity spanning 5–10 years. The two experts checked the correspondence between the treatment and contents comprising of two parts: Part A consists of 28 opened structured questions; Part B involves an essay. Quantitative assessments were done for both the questions. Another similar group of secondary school biology students was chosen to undertake the pilot study using first draft of the test questions. They managed to answer all the test questions within 1 h, and the written instructions were clear and comprehensible.

Treatment

The biology content and objectives of the St-IQL and CT were the same and were based on the Curriculum Development Centre, Ministry of Education Malaysia (2005). Both instructions were bilingual (English and *Bahasa Malaysia*). Students of both classes were exposed to 8 weeks of teaching with four 35-min periods per week and conducted by their own respective subject teachers in schools.

CT Group

The CT group students went through 8 weeks of Biology lessons without laboratory practices but received practical teaching through verbal explanation by their teacher during class for 2 h per week. They received direct learning using the question–answer method. The whole class (n = 28) was put together as a group: The teacher then transmitted her lecture notes through power point slides at the front. The biology concepts knowledge was directly delivered to the students. Upon discussion of the concepts aided by teacher's explanation, questions were then directed to the students by the teacher. All in all, the lecture instructional approach was imposed on CT group students throughout the teaching period where class discussions were carried out with the help of the teacher's explanation and answers.

St-IQL Group

The students received the same content lesson as the CT group students which were supplemented with laboratory practices. Four experiments (4 h) and 12 h of lecture classes were conducted during the treatment. Total hours were same with the CT group. Four subtopics were chosen for their hands-on practical classes. Faced with limited equipment and time constraint and large number of students (n = 36), the teacher took charge of choosing the experiments' procedures and hypotheses. The students, however, had a hand at picking their own team members and formed four persons in a group. Each group was only given one set of apparatus and chemical solutions during each practical.

A week before kicking off the practical classes, the teacher requested the laboratory assistant to prepare all the apparatus and materials. The teacher also briefed the students about the experiments' objectives, hypotheses, planning, strategy and procedures a week before the experiments began during lecture time in the classroom.

When the time came, the teacher took about 5 min to explain the experiment to the students in the laboratory. They were expected to complete the experiment within 45 min. Each student was required to perform the experiment at least one time by themselves to have the replication results. This is crucial because it lends great reliability to the outcomes and also irons out the difficulty faced by secondary school teachers today, where insufficiency of apparatus and materials for every student to conduct experiment is the norm. By eliminating this limitation, each student was able to conduct their practical rather being an observer during the laboratory period (which is often the case), thereby accomplishing effective laboratory management.

Upon the completion of the experiment, replication results were recorded and gathered from each student in the group. Thereafter, 5–10 min were taken up by the teacher to discuss the experiment's result and conclusion with the students before the class ended for the day.

Results and Findings

The results of the ANCOVA and description data analysis for post-test mean scores thinking skills between St-IQL and CT group are shown in Table 1.

Table 1 indicates that there was a significant difference between the post-test mean scores of the students who were using St-IQL instructional method

Table 1 Summary of ANCOVA

Class	Mean	Std. deviation	*N*	*F*	Eta square
St-IQL	23.31	7.910	36	18.063	0.228
CT	16.96	3.697	28		

(M = 23.31, SD = 7.91) and CT method (M = 16.96, SD = 3.70); F (1,61) = 18.06, $p = 0.00$, $p < 0.05$, with partial eta square = 0.23. The students who were exposed to St-IQL treatment achieved higher post-test mean scores than those who were exposed to CT method. A small effect size (partial eta squared) of 0.23 (Pallant 2011) suggests that 23% of the variance in the post-test scores was related to the differences in the instructional methods.

Discussion and Findings

The advantage of acquiring and improving scientific skills through laboratory practicals is hardly surprising given the bigger opportunity these students have by not being restricted to theoretically learning in the class (Dika and Sylejmani 2012) or at home, akin to daily life setting. It is believed that the constructivism in laboratory can help students in this study to apply almost all of the learning styles suggested in educational pedagogy (Abu-Asba et al. 2012).

In addition to the literature on structured-inquiry-laboratory teaching, this study illustrates the effectiveness of St-IQL, in particular the thinking skills ability of the students. In the test of thinking skills, St-IQL students evidently fared better than CT students given the same content and overall teaching or learning period. Validated by these findings, the St-IQL approach, overall, enhanced students' learning outcomes in terms of thinking skills and scientific skills. Coincidentally, these outcomes are supported by other previous findings (Hussain et al. 2011).

For this study, CT group used 100% of the timetable period during the two months' treatment to learn biology without hands-on activities while St-IQL group spent 25% of the same time allocation to execute hands-on activities on top receiving the same classroom teaching (75% of the timetable period) as CT group. From the study, we can see a significant improvement in St-IQL students' thinking skills test. This implied that time or quantity of teaching period was not a contributing factor in the study's result, but rather the quality of the teaching approach is.

Some of the researches substantiated that by using the same amount of teaching period to conduct two different instructional approaches, for same contents, inquiry-based learning approach would have higher chances to produce significant better outcomes than control groups (Hussain et al. 2011). Indeed, there was also a rare case where inquiry-based learning was allocated a longer time but no compelling difference was found in students' conceptual understanding compared to the control (Maria et al. 2013). Again, the quality of the instructional approach played a pivotal role in this study.

As prompted by this study, St-IQL students spent 16 h on learning biology using the inquiry-based approach for two months, resulting in better outcomes than the classroom teaching group. The test's effect size of test was 0.23 for the post-test. Based on Avsec and Kocijancic (2014)'s research (excluding all other factors while solely focusing on the period usage and effect size with similar cases), the

Table 2 Comparison of teaching hours, effect size and total hour needed to achieve 0.80 effect size

Research	Hours used for inquiry-based learning	Effect size obtained	Mean effect size per hour	Total hour needed to achieve 0.80 effect size
Avsec and Kocijancic (2014)	15	0.37 0.29 0.16	0.025 0.019 0.011	32.0 42.1 72.7
Hughes and Ellefson (2013)	5	0.34	0.068	11.8
This study	16	0.23	0.015	**53.3**

participants used 15 h on inquiry-based learning and the results showed that they had gained 0.37 effect size in knowledge development, 0.29 in research skills and problem-solving abilities and 0.16 for critical thinking and decision-making ability.

Another case study taken from Hughes and Ellefson (2013)'s research showed that their subjects who underwent 5 h of learning the inquiry-based learning (IBL) approach had gained 0.34 effect size of biology grade scores. If a comparison is to be made on all these studies to see the relationship between the teaching hours and the effect size with our study, by using simple mathematic calculation, the minimum teaching hours an inquiry-based learning approach student needed to achieve 0.80 large effect size as suggested by Cohen (Pallant 2011) would be 53.3 h as shown in Table 2.

The result in the table indicated that the effect size of the IBL approach for this study is still nowhere near the large effect size of 0.80 in the other two studies, which took fewer hours to accomplish. The discrepancy in teaching hours in the studies conducted by Avsec and Kocijancic (2014) and Hughes and Ellefson (2013), respectively, may have been the result of using different types of IBL approaches. Guided IBL was used by them as an instructional approach which can be considered as a higher level inquiry-based learning method than what this study (structured IBL) is trying to achieve (Zion and Mendelovici 2012). Some insights can be gleaned by comparing different levels of inquiry from a few studies among which are the higher the level of IBL approach used, the higher the chances of getting better outcome in teaching (Ketpichainarong et al. 2010).

Conclusions

It is safe to say that students would perform better academically if more teachers are willing to take up the challenge of providing IBL to their students in a protected learning environment such as the school. Undeniably, this construct is critical towards advancing student's thinking skills, playing an important role in the inquiry process. Together with a constructivist environment, there should be no objection to

using IBL as an instructional tool to develop students' scientific skills in the long run (Zion and Mendelovici 2012). In this context, the results of this research may open a window for educators towards understanding the basic core of structured inquiry-based learning.

References

Abdi, A. (2014). The effect of inquiry-based learning method on students' academic achievement in science course. *Universal Journal of Educational Research, 2*(1), 37–41.

Abu-Asba, A., Azman, H., & Mustaffa, R. (2012). Learning styles of Yemeni undergraduate science students. *GEMA: Online Journal of Language Studies, 12*(2), 571–591.

Avsec, S., & Kocijancic, S. (2014). Effectiveness of inquiry-based learning: How do middle school students learn to maximise the efficacy of a water turbine? *International Journal of Engineering Education, 30*(6(A)), 1436–1449.

Brickman, P., Gormally, C., Armstrong, N., & Hallar, B. (2009). Effects of inquiry-based learning on students' science literacy skills and confidence. *International Journal for the Scholarship of Teaching and Learning, 3*(2), 1–22.

Curriculum Development Centre Ministry of Education Malaysia. (2005). Integrated curriculum for secondary schools curriculum specifications. *Biology Form*, *4*, 1–77.

Dika, A., & Sylejmani, K. (2012). The level of impact on student success of participation in lectures and laboratory exercises. *Procedia-Social and Behavioral Sciences, 46,* 2403–2408.

Dkeidek, I., Mamlok-Naaman, R., & Hofstein, A. (2012). Assessment of the laboratory learning environment in an inquiry-oriented chemistry laboratory in Arab and Jewish high schools in Israel. *Learning Environments Research, 15*(2), 141–169.

Hafizan, E., Halim, L., & Meerah, T. S. (2012). Perception, conceptual knowledge and competency level of integrated science process skill towards planning a professional enhancement programme. *Sains Malaysiana, 41*(7), 921–930.

Hiong, L. C., & Osman, K. (2013). A conceptual framework for the integration of 21st century skills in biology education. *Research Journal of Applied Sciences, Engineering and Teachnology, 6*(16), 2976–2983.

Hughes, P. W., & Ellefson, M. R. (2013). Inquiry-based training improves teaching effectiveness of biology teaching assistants. *PLoS ONE, 8*(10), e78540.

Hussain, A., Azeem, M., & Shakoor, A. (2011). Physics teaching methods: Scientific inquiry vs traditional lecture. *International Journal of Humanities and Social Science, 1*(19), 269–276.

Johnson, C. C., Zhang, D., & Kahle, J. B. (2012). Effective science instruction: Impact on high-stakes assessment performance. *RMLE Online Research in Middle Level Education, 35* (9), 1–14.

Ketpichainarong, W., Panijpan, B., & Ruenwongsa, P. (2010). Enhanced learning of biotechnology students by an inquiry-based cellulase laboratory. *International Journal of Environmental & Science Education, 5*(2), 169–187.

Kuhlthau, C. C. (2010). Guided inquiry: School libraries in the 21st century. *School Libraries Worldwide, 16*(1), 17–28.

Lee, T. J., & Kamarudin, N. (2014). Inquiry in learning science. *International Journal of Technical Research and Application, 10*(10), 61–65.

Liu, S.-H., & Lee, G.-G. (2013). Using a concept map knowledge management system to enhance the learning of biology. *Computers & Education, 68,* 105–116.

Malaysia Education Blueprint 2013–2025. (2012). In *Ministry of Education Malaysia. Preliminary report-executive summary*. Kuala Lumpur: Ministry of Eduction.

Malaysia Education Blueprint 2013–2025 (Preschool to Post-Secondary Education). (2013). 2013 (pp. 1–292).

Maria, B., Marjan, G., An, L., Parappilly, M. B., Siddiqui, S., Zadnik, M. G., et al. (2013). An inquiry-based approach to laboratory experiences: Investigating students' ways of active learning. *International Journal of Innovation in Science and Mathematics Education, 21*(5), 42–53.

Miri, B., David, B.-C., & Uri, Z. (2007). Purposely teaching for the promotion of higher-order thinking skills: A case of critical thinking. *Research in Science Education, 37*(4), 353–369.

Mumba, F., Chabalengula, V. M., Wise, K., & Hunter, W. J. F. (2007). Analysis of new Zambian high school physics syllabus and practical examinations for levels of inquiry and inquiry skills. *EURASIA Journal of Mathematics, Science & Technology Education, 3*(3), 213–220.

National Research Council. (2000). *Inquiry and the national science education standards: A guide for teaching and learning*. Washington, DC: National Academic Press.

Pallant, J. (2011). *SPSS survival manual—A step by step guide to data analysis using SPSS* (4th ed.). Australia: Allen & Unwin.

Pandian, A., & Balraj, S. (2010). Driving the agenda of learning by design in science literacy in Malaysia. *E-Learning and Digital Media, 7*(3), 301–316.

Pich-Otero, A., & Molina-Ortiz, S. (1998). Laboratory practical work as a technological process. *Biochemical Education, 26,* 281–285.

Saat, R. M., & Ismail, N. A. (2003). Instructional strategies and science achievement of form 2 students in Malaysia: Finding from the Trends in International Mathematics and Science study (TIMSS) 2003. *Journal of Science and Mathematics Education in S.E. Asia, 29*(1), 62–78.

Sadeh, I., & Zion, M. (2009). The development of dynamic inquiry performances within an open inquiry setting: A comparison to guided inquiry setting. *Journal of Research in Science Teaching, 46*(10), 1137–1160.

Sim, W. S. L., & Arshar, M. Y. (2010). A preliminary study of chemistry teachers' question in inquiry teaching. *Sains Humanika, 2*(4), 217–224.

Simandi, V., & Vamcek, J. (2015). The use of inquiry based education in a simulation software environment in pre-service ICT teacher training. *International Journal of Information and Communication Technologies in Education, 4,* 5–15.

Tan, S. Y., & Halili, S. H. (2015). Effective teaching of higher-order thinking (HOT) in education. *The Online Journal of Distance Education and E-Learning, 3*(2), 41–47.

Trna, J., Trnova, E., & Sibor, J. (2012). Implementation of inquiry-based science education in science teacher training. *Journal of Educational and Instructional Studies, 2*(4), 199–209.

Tuan, H.-L., Chin, C.-C., Tsai, C.-C., & Cheng, S.-F. (2005). Investigating the effectiveness of inquiry instruction on the motivation of different learning styles students. *International Journal of Science and Mathematics Education, 3*(4), 541–566.

Voogt, J., Tilya, F., & Akker, J. (2009). Science teacher learning of MBL-supported student-centered science education in the context of secondary education in Tanzania. *Journal of Science Education and Technology, 18*(5), 429–438.

Yunus, H. M., Ismail, Z., & Raper, G. (2004). Malaysian primary teachers' classroom practice of teaching and learning science. *Journal of Science and Mathematics Education in S.E. Asia, 27* (1), 166–203.

Zion, M., Cohen, S., & Amir, R. (2007). The spectrum of dynamic inquiry teaching practices. *Research in Science Education, 37*(4), 423–447.

Zion, M., & Mendelovici, R. (2012). Moving from structured to open inquiry: Challenges and limits. *Science Education International, 23*(4), 383–399.

Effectiveness of Cooperative Learning Approach in Developing Critical Thinking Skills of Secondary Students

Evangeline Quines

Abstract This study identified the effectiveness of cooperative learning approach in developing critical thinking skills of secondary students. The study involved 115 second-year level students as subjects. All the subjects were taught lessons using the lecture discussion method and cooperative learning approach alternately. The pseudo-experimental method utilizing the repeated measures design was used in the study. Correlation *t*-test was used to compare the mean scores on the pretest/posttest of achievement tests and attitudinal inventory scale tests, and Pearson moment correlation was used to determine the correlation between the mean scores on achievement and attitude of students. The study found out that there is a significant improvement in the critical thinking skills of students taught with the use of lecture discussion method and cooperative learning approach. The gain scores between the two groups do not significantly differ during the first three weeks; however, the cooperative learning approach has significantly improved the critical thinking skills of the students on the fourth, fifth, and sixth weeks, respectively. The cooperative learning attitude gain scores are higher than the lecture discussion method attitude gain scores. Lecture discussion method is not significantly related to critical thinking scores, while cooperative learning approach is significantly related to critical thinking scores.

Keywords Cooperative learning approach · Critical thinking skills · Lecture discussion method

E. Quines (✉)
Department of Education Region 02, Andarayan National High School, 3503 Andarayan, Solana, Cagayan Valley, Republic of the Philippines
e-mail: quines_aguirre@yahoo.com.ph

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_12

Introduction

The English language has a special place in the world today. It is becoming the most important international language for oral interaction in academic circles, economic and business transactions, and international diplomacy. It is also the major international language of printed information. As a tool for empowerment, Remonde (2003) points out that English language can be used as an instrument for membership in the international community, for modernization and economic prosperity. This goal of attaining global competitiveness is achieved through the knowledge in using the English language proficiently.

Teachers in the twenty-first century must be inquisitive to select appropriate teaching strategies designed to answer the academic needs of students, especially in the development of critical thinking skills which Paul (1999) defines as the intellectual process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information gathered from observation, experience, reflection, reasoning ,or communication as a guide to belief and action.

One of the promising approaches which teachers could employ in their language instruction in the development of critical thinking skills is cooperative learning. In cooperative learning, the teachers have roles in structuring learning situations cooperatively such as specifying the objectives for the lesson, placing the students in productive learning groups, and providing appropriate materials, explaining the cooperative goal structure, monitoring students as they work, and evaluating student's performance. It is in this context that the researcher, being an English teacher, is interested to find out the effects of cooperative learning approach in developing critical thinking skills among secondary school students.

Cooperative Learning and Lecture Discussion Method

Cooperative learning works equally well with children who have highly developed responsibility skills or with children who need to learn to work together. Kagan (1990) states that cooperative learning structures are content-free ways of organizing social interaction in the classroom. He also stresses that in cooperative learning, group work is carefully designed to promote group interdependence and individual responsibility. It provides a chance for skill learning while at the same time teaching responsibility.

Newby et al. (2006) emphasize that cooperative learning shall involve small groups of students working together to learn collaborative and social skills while working toward a common academic goal or task. This method is specially designed to encourage students to work together, drawing on their individual experiences, skills, and levels of motivation to help each other achieve the desired result.

Cooperation and interaction allow students to learn from several sources, not just from the teacher, while also providing each student the opportunities to share their own abilities and knowledge. Norton and Wiburge (2003) assert that cooperative learning requires positive interdependence where each member of the group is actively involved and committed to the group's success.

Lecture Discussion Method focuses on the ability of the teacher to share lesson prepared where students are required to listen and jot down notes based on the presentation of the teacher. Students are asked to respond to questions asked during the discussions and answer the tests given at the end of the lesson. Learners have limited opportunity to share ideas and inquire some doubts on topics being discussed.

Critical Thinking Skills and Cooperative Learning

According to Facione (1992) **critical thinking** is a purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. Also, Scriven and Paul (1992) define **critical thinking** as the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication as a guide to belief and action.

The need to develop **critical thinking** is indispensable, especially in this fast-paced world. Students should be equipped with the necessary skills that make them wise and responsible citizens who contribute to society, and not be merely a consumer of society's distractions. According to Huitt (1992), the movement to the information age has focused attention on good thinking as an important element of life's success. These changing conditions require new outcomes, such as critical thinking to be included as a focus of schooling.

Research Problem

The teaching and learning process is a two-way process or a "give and take" process which involves the teaching as the stimulus and learning as the response. The learner learns if he/she reacts to his/her environment (stimuli). Lardizabal (1991) pointed out that what the student learns depends on what the teacher does. This means that the facilitator of learning is the teacher who provides the conditions for effective learning and who seeks to meet the needs, goals, and interest of the learners.

Cooperative learning is one of the better researched instructional strategies that existed, and the results of this research indicated that cooperative learning produces

cognitive, affective, and interpersonal benefits. According to Johnson and Johnson (1994) and Slavin (1995), when cooperative learning strategies are implemented effectively, these can improve students' achievement more than traditional approaches to instruction, both on teacher-made and standardized tests. These improvements resulted from increased student motivation, greater time in task, and active involvement.

It is in this context that this study would like to study and examine the effectiveness of cooperative learning in developing critical thinking skills of students.

Research Objectives

Generally, this study aimed to identify the effectiveness of cooperative learning approach in developing the critical thinking skills of students. Specifically, it sought to answer the following questions:

1. How effective is cooperative learning approach in developing the critical thinking skills of students as compared to the traditional lecture discussion method?
2. What is the attitude of the students toward the two teaching methods used?
3. Is there a relationship between critical thinking skills and attitude toward lecture discussion method and cooperative learning approach?

Research Methodology

Research Design

The pseudo-experimental method utilizing the repeated measures design was used in the study. Two groups/sections were utilized as subjects of the study. It is repeated because each group was exposed to both teaching methods alternately. This alternate use of the method was repeated for six weeks.

Respondents and Sampling Procedure

The study involved two sections of the second-year level of Andarayan National High School with a total of 115 students (56 students in section A and 59 students in section B). All of them were taken as subjects who were taught lessons using the lecture discussion method and cooperative learning approach alternately.

Research Instruments

The study made use of six pretests and six posttests as main instruments in the study. Also, the attitudinal inventory scale was used before and after the experimental period. These pretests and posttests were used to assess the critical thinking skills of students in organizing ideas, making inferences, giving interpretations, comparing and contrasting, and making judgments. The attitudinal inventory scale was used to measure the attitude of the students toward lecture discussion method and cooperative learning approach.

Collection of Data

Pre-treatment Phase

Within the duration of the study, the teacher prepared six pretests and six posttests to test the critical thinking skills of the subjects. Each of these pretests was administered weekly by the teacher before the discussion of the topic or selection.

Treatment Phase

The subjects were taught alternately using the lecture discussion method and cooperative learning approach for the duration of the study. The different cooperative learning approaches, namely Think-Pair-Share, Round Robin Brainstorming, and Numbered Heads were utilized in the cooperative group.

Schedule of the two approaches

Week	Section	Method
1st week	II-A	Cooperative learning approach
	II-B	Lecture discussion method
2nd week	II-A	Lecture discussion method
	II-B	Cooperative learning approach
3rd week	II-A	Cooperative learning approach
	II-B	Lecture discussion method
4th week	II-A	Lecture discussion method
	II-B	Cooperative learning approach
5th week	II-A	Cooperative learning approach
	II-B	Lecture discussion method
6th week	II-A	Lecture discussion method
	II-B	Cooperative learning approach

Post-Treatment Phase

After the duration of the study, the results of the pretests and posttests on organizing ideas, making inferences, giving interpretations, comparing and contrasting, and making judgments, were evaluated and compared based on the research problems. Also, the attitudinal inventory scale was administered before and after the experimental period.

Analysis of Data

The data were analyzed with the use of descriptive and inferential statistics. Descriptive statistics such as frequency counts, percentages, means, standard deviation, and weighted mean were used to analyze data to answer descriptive questions. For the inferential questions, the *t*-test for independent groups was used to compare the pretest and posttest scores between the experimental and control groups. On the other hand, the *t*-test for dependent groups was used to assess the difference between the pre and posttest scores of each group. To determine the effectiveness of the two methods, the gain scores between the posttest and pretest were used. The Pearson product moment correlation was used to determine the relationship between the attitude of students toward English as a subject and the critical thinking skills of the students.

Result/Discussion

Effectiveness of Cooperative Learning Approach in Developing the Critical Thinking Skills of Students as Compared to the Traditional Lecture Discussion Method

There is a significant improvement in the critical thinking skills of students taught with the use of lecture discussion method and cooperative learning approach. The mean gain scores of students taught with lecture discussion method and cooperative learning approach in the different critical thinking skills do not significantly differ as shown in their total mean gain scores (Figs. 1, 2, and 3).

Results show that in the first three weeks, the gain scores between the two groups do not significantly differ as shown in the computed *t*-values. However, the cooperative learning approach has significantly improved the critical thinking skills of the students as shown by the computed *t*-values on the fourth, fifth, and sixth weeks, respectively.

Skills	Mean Gain Scores		Computed t- value	Probability
	Lecture Discussion Method	Cooperative Learning Approach		
Organizing Ideas	2.97	3.46	0.631ns	0.530
Making Inferences	3.04	3.17	0.218ns	0.828
Giving Interpretations	2.80	3.17	0.545ns	0.587
Comparing and Contrasting	2.32	2.50	0.248ns	0.804
Making Judgments	2.22	2.32	0.185ns	0.853
Total Scores	13.85	14.13	0.171ns	0.865

ns- not significant

Fig. 1 Comparison of the mean gain scores of students taught with lecture discussion method and cooperative learning in the different critical thinking skills

Time	Mean	SD	Standard Error of Difference	Computed t-value	Probability
Lecture Discussion Method					
Pretest	42.22	3.66	0.479	1.742ns	0.084
Posttest	43.05	3.71			
Cooperative Learning Approach					
Pretest	42.78	4.04	0.472	5.415**	0.000
Posttest	45.34	3.89			

ns- not significant
** - significant at .01 level

Fig. 2 Comparison of the attitude of students toward the use of lecture discussion method and cooperative learning approach

Group	Mean Gain Attitude Scores	Standard Deviation	Standard Error of Difference	Computed t-value	Probability
Cooperative Learning	2.56	5.06	0.616	2.794**	0.006
Lecture Discussion Method	0.83	5.14			

** - significant at .01 level

Fig. 3 Comparison between the mean gain attitude scores of the students in both cooperative learning approach and lecture discussion method

Variable	Correlation Coefficient	Probability
Attitude and Posttest Scores		
Lecture Discussion Method	0.004ns	0.966
Cooperative Learning Approach	0.189*	0.043

ns-not significant
* - significant at .05 level

Fig. 4 Relationship between the attitude of students and their posttest scores in the cooperative learning and lecture discussion setup

Attitude of the Students Toward the Two Teaching Methods Used

Though both approaches showed improvements in their attitude toward English as shown in their overall weighted mean in the pretest and in the posttest, it was found that the attitude of students toward lecture discussion method is not significant while the attitude of students toward cooperative learning is significant as shown by the computed *t*-value. Moreover, it was found that the cooperative learning attitude gain scores are higher than the lecture discussion method attitude gain scores (Fig. 4).

Relationship Between Critical Thinking Skills and Attitude Toward Lecture Discussion Method and Cooperative Learning Approach

Lecture discussion method is not significantly related to critical thinking scores. On the other hand, cooperative learning approach is significantly related to critical thinking scores.

Significance/Contribution of the Study

- Curriculum planners and administrators may use this study as a basis for curriculum revision emphasizing the development of critical thinking skills using cooperative learning strategies.
- Teachers may employ the different cooperative learning strategies to improve the teaching-learning process and the critical thinking skills of their students.
- Other researchers may also use this study as a reference in order to come up with other related studies. The strategies used in this study can be compared also to other strategies that could develop critical thinking skills.

Conclusions

Based on the findings, the following conclusions are drawn

- Cooperative learning is an effective alternative to the conventional method of developing critical thinking skills.
- The elements of this method help to develop critical thinking skills and social skills of learners.

References

Facione, PA. (1992). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction* (A report for the American Philosophical Association). http://philosophy.hku.hk/think/critical/ct.php

Huitt, W. (1992). Problem solving and decision-making: Consideration of individual differences using the Myers-Briggs type indicator. *Journal of Psychological Type, 24,* 33–44.

Johnson, D. W., & Johnson, R. T. (1994). *Learning together and alone: Cooperation, competition, and individualization* (4th ed.). Needham Heights, MA: Allyn and Bacon.

Kagan, S. (1990). *Cooperative learning resources for teachers*. California: Resources for Teachers.

Lardizabal, A. (1991). *Principles and methods of teaching*. Quezon City: Phoenix Publishing House.

Newby, T. J., Stepich, D. A., Lehmen, J. D., & Russel, J. D. (2006). *Educational technology for teaching and learning*. Ohio: Pearson Education Inc.

Norton, P., & Wiburge, K. (2003). *Teaching with technology: Designing opportunities to earn*. Ohio: Pearson Education Inc.

Slavin, R. E. (1995). *Cooperative learning: Theory, research and practice* (2nd ed.). Needham Heights, Boston, MA: Allyn and Bacon.

Paul, R. (1999, October). Blooms taxonomy and critical thinking instruction. *Elementary School Journal*, *VI*.

Remonde, CM. (2003, February). The return to English. *Manila Bulletin* (Philippines).

Scriven, M., & Paul, R. (1992, November). Critical thinking defined. In *Handout given at critical thinking conference*. Atlanta, GA.

Developing Effective Cultures of Student Partnership in Higher Education

E. Curtis

Abstract Working in partnership with students provides an effective way of developing greater student engagement, enhancing a sense of belonging and deeper understanding of their contribution to the academic community. This paper will discuss the context of student partnership within higher education with the UK and will present an action research approach in the systematic enquiry of activities in determining the characteristics of pedagogies that can create effective partnership working. The work is underpinned by the use of constructivist theory in the planning of interventions and activities at Gray's School of Art and contextualises this practice through reference to current literature. The work has informed national practice guidance conducted in collaboration with Student Partnership Quality Scotland (**sparqs**), a government funded agency that places students at the centre of decisions being made about the quality and governance of the learning experience.

Keywords Learning culture · Pedagogy · Quality assurance · Student engagement · Student partnership

Introduction

According to Dunne and Zandstra (2011), there exists an 'important difference between an institution that "listens" to students and responds accordingly, and an institution that gives students the opportunity to explore areas that they believe to be significant, to recommend solutions and to bring about the required changes' (p. 4). The work of Dunne and Zandstra (2011) viewed this institutional 'listening' as supporting the perspective of the student as 'consumer' and conversely saw the possibility to 'explore' ideas with students as 'active collaborators' and 'co-producers', as having transformational potential (p. 4).

E. Curtis (✉)
Gray's School of Art, Robert Gordon University, Aberdeen, Scotland
e-mail: e.curtis@rgu.ac.uk

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_13

Dunne and Zandstra's perspective is an important one when placed in the context of the National Student Survey (NSS). This is operated by an independent market research company, Ipsos MORI, and is commissioned by the Higher Education Funding Council for England (HEFCE) on behalf of the Higher Education (HE) funding councils for Wales, Northern Ireland, and Scotland. The survey seeks to measure the quality of the teaching and learning experience by gathering responses from final year students. The results are a widely recognised source of public information data giving the students a powerful collective voice. The plethora of NSS campaigns across the HE sector using the mantra 'You said… We did' would suggest that the student voice is actively promoted, listened to, and acted upon right across the sector. As Dunne suggests, the act of listening to the student voice may implicitly support the perspective of student as 'consumer'. Indeed, institutional advertising promoting the effectiveness of the student voice reinforces this view for both staff and students. The NSS and Key Information Sets (KIS) derived from institutional metrics are mechanisms that influence certain power dynamics between staff, students, and the institution. Institutions actively measure staff performance against such metrics, and students understand the power of their voice therefore the role of partnership and collaboration presents challenges.

Healey et al. (2014) discuss student partnership as a process of engagement, and not a product or outcome. It suggests partnership is a 'way' of doing things. They also identify the potential tensions between partnership working which 'places value on a creative process that may result in unexpected outcomes' and that of the institution's need to achieve specific metrics and quantifiable results (p. 10).

Shreeve et al. (2010) stated that 'underpinning art and design education is an expectation that students will take their own creative development of the subject. They are expected to experiment and explore, producing diverse responses to projects, not right answers' (p. 129). Referencing the work of Shulman (2005), they noted that signature pedagogies were characterised as 'pervasive, routine, and habitual' in their subject context (p. 3). Art and Design pedagogies were seen within this context.

Shreeve et al. (2010) identify physical and material dimensions of learning in art and design; these involve the visible, sensual, social, and reflective processes inherent within practice. This continuous critical and reflective dialogue develops attitudes and skills for approaching work that has no defined outcome; the 'uncertainty' of outcome being a relevant characteristic that tutoring staff facilitate. The consequence of such support for the student gives rise to substantial dialogue and exchange between tutor and student.

In relation to what they refer to as 'a kind of exchange', the signature pedagogies within art and design would appear to support the approach advocated by Dunne and Zandstra (2011) and Healey et al. (2014) in their guidance on student partnership.

The collaborative approach fostered through project-based work, especially 'live project' work in conjunction with external clients, is an established feature within the curriculum at Gray's and indeed within the creative industries disciplines as a whole. This is seen as a core learning experience in support of students'

professional and employability skill sets. Crawford et al. (2015) comment on the features of this type of pedagogical practice in their work that sought to identify pedagogies of partnership.

The motivation for the school to build upon students' own knowledge of their educational experience through active contributions to school wide projects provided the opportunity to test approaches to partnership working that built upon the school's predominant signature pedagogies.

Research Problem

Data from staff and student surveys on the teaching and learning experience revealed lower satisfaction percentages in some key areas. These were assessment and feedback, personal professional development and student and staff expectations of the learning environment/experience. Historically, such an analysis would be undertaken by teaching staff but informed by consultation with students. The school management was aware of the educational research within the area of partnership and saw an opportunity to explore these issues through a partnership methodology.

Objectives of the Study

The work was underpinned by the following research questions: (a) how can the school build on its signature pedagogies within art and design to support the development of an effective partnership culture and (b) what lessons can be learnt from this initial pilot activity that would support the work of the institution-led subject review (ILSR) whereby the effective collaboration between staff and student would create the reflective analysis supporting the school's forward plans.

Research Methodology

This work explores the collaborative activities and co-designed outputs from 30 student partner participants and staff of the school engaged as teacher-researchers. Three groups were established to address the themes; these then informed the partnership approach taken for ILSR reflective analysis. Using an action research methodology, the work was undertaken by firstly conducting a review of current partnership practice; this was explored in order to develop a series of questions and potential courses of action in order to test ideas. The progression of the study was subject to multiple methods of collecting data that included continual evaluation through observation, interview, reflective journals, and focus groups. Multiple

participants including students, teaching staff, and external collaborators contributed to the portfolio of evidence. The activities under scrutiny also produced a range of outputs that enabled further reflection and provided opportunities to adjust the activities as they progressed.

The three thematic groups included assessment and feedback (AF), personal professional development (PPD), and staff and student expectations (SSE). The groups were composed of a mixed discipline of students from the broad grouping of subjects taught within the school; these were graphics, fashion and textiles, three-dimensional design, and fine art, and were from mixed year groups. All three groups delivered agreed outcomes on their projects at the end of the period of investigation.

Throughout the duration of the projects, members of staff acted as facilitators and co-producers, as observers, as team members, and project leads. The shifting roles that staff adopted echoed the flexibility required when working with students within the studio environment. The partnership project meetings had no specific structure to follow but were built organically depending on the interactions and decisions at the end of each session. Indeed for staff, it was necessary to reflect each week on how the group had operated in order to keep the flow of activity going. Working notes from the workshops, observations of the interactions, and reflective journals from the participants were used in the evaluation and development of further action. The nature of the work was cyclical and encompassed both 'reflection-on-action' and 'reflection-in-action' (Schön 1983).

Throughout the course of the work students were placed in varying roles. These were as participant and collaborator, researcher, and co-designer making decisions alongside staff.

Results/Discussions

The output from the thematic groups was significant in progressing the school's partnership approach. The model was productive not only in gaining outputs but also in raising the students' awareness of their collaborative efforts within decision-making processes. Both staff and students indicated that the process was transparent and required a sense of trust in order to engage fully.

The activities mirrored the approach taken in studio projects, and both staff and students identified the ease within which they operated, both enhancing their understanding of curriculum delivery and this newfound transparency of approach that opened up new avenues of discussion and exchange.

The PPD group mapped out a new PPD process and agreed a launch process within the school that would affect all year groups. The AF group mapped out a route map for streamlining assessment criteria identifying agendas to be explored within staff development events, and the SSE group developed a staff and student charter, now promoted widely within the school.

Dunne and Zandstra (2011) identified the importance of the student as the 'driver' of change and placed emphasis on student 'action'. This was seen as having a greater importance than the institution as driver of change, and subsequent emphasis on the student voice. The school was committed to developing its culture of student partnership but recognised that it needed to critically reflect on its practice and do so in collaboration with others externally in order to make a shift in practice to encourage our students to drive change rather than ourselves.

In order to provide this, the school collaborated with sparqs, and in doing so, provided a research base for developing a national practice guide on student engagement within institution-led subject review.

In consultation with sparqs, it was decided that the school's student partners should be able determine the approach and format of their response to their reflection of their student learning experience. Whilst the very nature of the ILSR process demands consultation and representation of the student voice, the school took the decision to provide greater autonomy to the students to drive that consultation and identify direction. Rather than staff leading the process, the student partners were supported by sparqs to take on this role. As a result, the students determined their own research focus, methods, and resultant outcomes and promoted these accordingly. This is an approach that features heavily in the national practice guide.

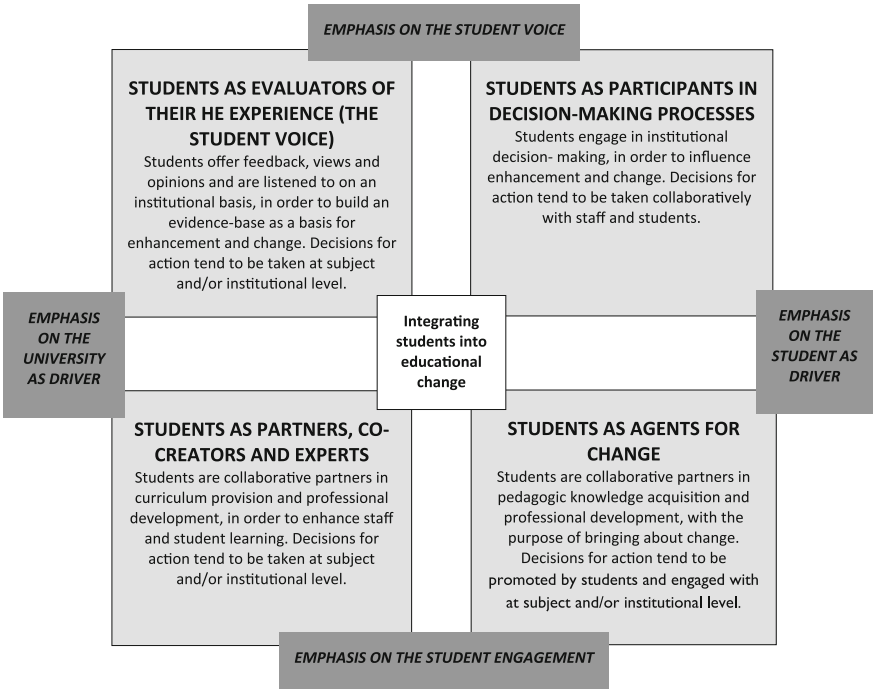


Fig. 1 A theoretical model for students as change agents (Dunne and Zandstra 2011)

Dunne and Zandstra's theoretical model for students as change agents was particularly useful as a tool for evaluating our partnership activities within the school (Fig. 1).

The students' research methods were varied; some facilitated and recorded focus groups and interviews; other groups collected ideas, views, and opinions from social media, and surveys in order to present written findings, with some producing graphic representations of issues that were deemed of most importance to the student body. Not surprising were more visually interactive approaches to developing research material, with some groups of students using graffiti boards to collect comments and ideas within group sessions. The social aspect of the research was also recorded through photographic imagery, with the distillation of the research being produced in e-booklet form.

Contributions of the Study

The practical implications for effective student partnership practices place significant expectations on staff and institutions to critically reflect on their collaborative working practices, and do so within a transparent and open process. This research presents a case study that other institutions can consider when engaging in, and developing partnership approaches with students. The resultant national practice guide, now available as a tool for others preparing for institution-led subject review, commends the school's practice as evidence of the nationally significant work of the student partners (Varwell 2016). The role of external critical partner provided by sparqs provided the opportunity for reflection and challenge alongside a partner immersed within partnership practices within the sector.

Conclusions

Working in partnership with students provides an effective way of developing greater student engagement. In critically evaluating the core features of a successful partnership approach, the 'visibility' and the continual 'attention' to the proactive evolution of activities through partnership pedagogies was seen as key to sustaining momentum and interest from the student body. The need for more 'localised' partnership activities involving course tutors was viewed as a way to progress the school's approach and would make the potential of partnership activities more specific and accessible at subject level.

The work continues in the school and will evolve through the sustained rigour of critical self-reflection and attention to continual enhancement. Partnership work will sit alongside the national measurement of student satisfaction provided by the NSS. The developing culture of sharing and collaborating within the school will indeed contribute to student satisfaction, collegiality, and student empowerment. It is

however the need for an authentic partnership culture that will drive enhancement and not the chasing of metrics in league tables. The dynamics of power within relationships lies within our capacity to collaborate and share.

References

Crawford, K., Horsley, R., Hagyard, A., & Derricott, D. (2015). *Pedagogies of partnership: What works* (A report on the findings of the Higher Education Academy funded project examining how partnership-based pedagogies impact on student learning at the University of Lincoln, 43). Retrieved June 4 from www.heacademy.ac.uk/project/pedagogies-partnership-what-works

Dunne, E., & Zandstra, R. (2011). *Students as change agents—New ways of engaging with learning and teaching in higher education* (pp. 1–17). University of Exeter/ESCalate/Higher Education Academy Publication. Retrieved June 4, 2016 from http://www.escalate.ac.uk/8064

Healey, M., Flint, A., & Harrington, K. (2014). *Engagement through partnership: Students as partners in learning and teaching in higher education* (pp. 7–11). Higher Education Academy. Retrieved June 4, 2016 from http://www.heacademy.ac.uk/engagement-through-partnership-students-partners-learning-and-teaching-higher-education

Shreeve, L., Sims, E., & Trowler, P. (2010). 'A kind of exchange': Learning from art and design teaching. *Higher Education Research & Development, 29*(2), 125–138. doi:10.1080/07294360903384269.

Schön, D. A. (1983). *The reflective practitioner*. NY: Basic Books.

Shulman, L. (2005). Pedagogies of uncertainty. *Liberal Education*, *91*(2),. Retrieved June 5, 2016 from http://www.aacu.org/publications-research/periodicals/pedagogies-uncertainty

Varwell, S. (2016). *Engaging students in institution-led subject review; A practice guide for universities and students' associations*. Retrieved June 5, 2016, from http://www.sparqs.ac.uk/ch/ILRGuidance.pdf

Expression of Male and Female Forms in Anthropomorphic Entities for Application in Educational Robotics: A Pilot Study

Andrew Chiou

Abstract Gender perception and expression by autonomous anthropomorphic entities are necessary in many digitally based educational teaching and learning activities. It is natural for a participant to expect the presence or the absence of a specific gender during his or her interaction with an anthropomorphic device, computer, human–computer interface or artificial entity such as robots. This work-in-progress classifies different gender forms according to how the entity presents itself to human participants.

Keywords Gender · Anthropomorphic · Fuzzy logic · Autonomous robot · Educational robotics

Introduction

In some activities such as interaction with robots as an educational delivery platform, the perception and expression of gender are critical to the success of role-play and training. However, in many of these scenarios, the gender of the entity represented in these applications is mostly predefined or hardcoded. The ability to adapt and self-modify is rarely adopted. This paper seeks to address this by presenting a method of classifying and modelling different types of gender. A novel experiment using crowd sourcing of user responses is also discussed.

A. Chiou (✉)
School of Engineering & Technology, Central Queensland University, Rockhampton, QLD 4701, Australia
e-mail: a.chiou@cqu.edu.au

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_14

Research Problem

Norman's (1986) theory of action states the seven stages of activity that are to take place from when an idea is conceived to the actual stage the idea actually takes place. However, it is now well understood that human participants in human–computer intensive interactive activities do not operate in this way in reality. For example, a participant may begin by several approximations of their intended expectation in contrast to one (i.e. "the robot is speaking to me in a female voice, therefore it must be female" compared to "the robot seems to be speaking to me in a female voice, therefore it could be a female for now").

In order to present a more useable theory of action to support the techniques in this project, a revision is introduced to include more sophisticated degrees of separation (Chiou et al. 2013; Lye et al. 2011). In this extension, the theory of action now accounts for the participant or user's perception of gender as expressed by the anthropomorphic entity (Fig. 1). In gender specific functions, the desired outcome may be diffused by having the human participant erroneously perceive the wrong gender form. In the un-extended version of Norman's theory of action, this misperception is propagated to the physical system if unchecked, often leading to undesirable results.

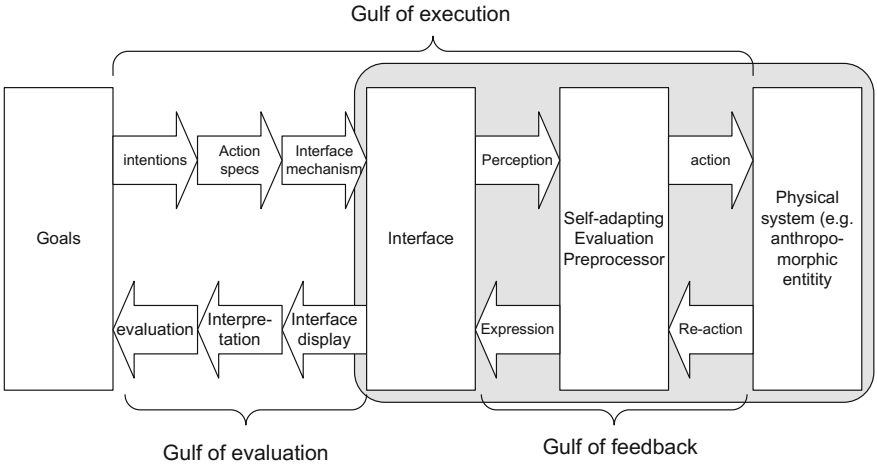


Fig. 1 Extension Norman's gulf of execution and evaluation

Objectives of the Study

Fundamentally, it is widely practiced and accepted that when computerised software in educational applications or other anthropomorphic needs to express a specific gender form for the purpose of interaction with human participants and users, the three main forms adopted are *male*, *female* and *non-defined*. These attributes are mostly hardcoded or prefixed when such games or entities are developed. However, expressions of such nature are not always accurate as the perception of human participants may not necessarily match that of what is expressed by the artificial entity. When such inaccurate matches occur, ambiguity can arise leading to unexpected outcome of the intended purpose of the original function. Therefore, this pilot study classifies different gender forms according to how the entity presents itself to human participants. In turn, the perception of how convincing the expression is, is also measured using an autonomous robot capable of social interaction.

Research Methodology

Conventionally, different gender forms are expressed through self-directed description such as self-declaration (e.g. "I am a female robot") or labels (e.g. "My name is Michael"). These fundamental expressions can be ambiguous arising from diverse ethnic background where the name, Michael, may not necessary be a man's or boy's name. Hence, there is need for further classification of the different expressions that can take place to present the correct gender forms to the recipient. The following are all different attributes that have been successfully identified as being the most prevalent and significant for the expression of gender forms in anthropomorphic entities:

Classification of Expression of Gender Forms

X_1: Self-Declaration

This is the fundamental expression where the artificial entity declares, "I am a female robot". The physical appearance is irrelevant or disregarded as the human participant accepts this at face value as shown in Fig. 2.

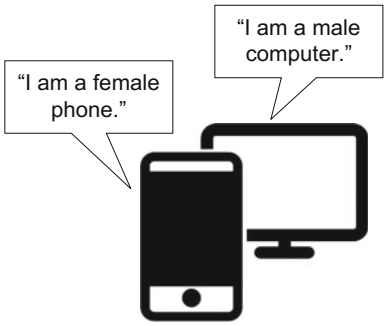


Fig. 2 Self-declaration

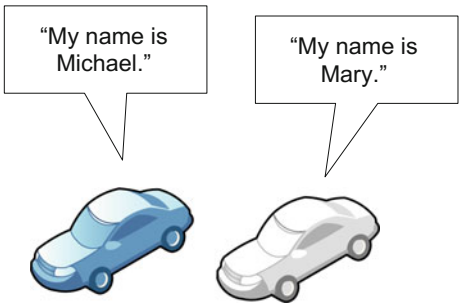


Fig. 3 Self-label

X_2: Self-Label

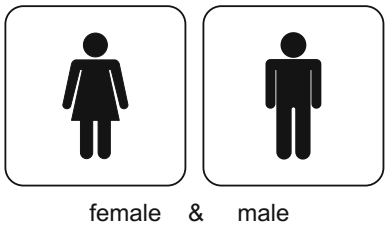
This is the fundamental expression where the artificial entity declares, "My name is Michael". The physical appearance is irrelevant or disregarded as the human participant accepts this at face value as shown in Fig. 3. However, this is only true, if the participant is aware of cultural conventions, that is, the name Michael may not necessarily be understood as being a male attributed name in different culture or ethnic groups.

X_3: Physical Appearance

Gender is expressed through the physical appearance of the entity in the forms that people are most aware of. For example, a muscle bound or heavy set appearance would be perceived as being masculine. While a petite and slim form would be perceived as being feminine. This is demonstrated by the AILA, female form humanoid robot (Muoio), and Atlas, a male form humanoid robot (Boston Dynamics: Dedicated to the Science and Art of How Things Move), as depicted in Fig. 4.

Fig. 4 Physical appearance

Fig. 5 Symbolic



X_4: Symbolic

The intended gender is expressed through self-labelling. However, the difference with *X_2: self-label* is that instead of self-declaration, the assertion is made through the display of symbols that are universally used to announce the different genders, as shown in Fig. 5.

X_5: Gestures

The intended gender is expressed by the anthropomorphic entity through a serious of continuous *dynamic* motion, as shown in Fig. 6. For example, the entity walks in a military marching motion which conveys an *X_3: physical appearance* attribute. In autonomous bipedal robots, the type of gait performed can indirectly convey what gender it wishes to express.

X_6: Posture

The intended attribute is expressed by a *static* pose, as shown in Fig. 7. For example, an anthropomorphic entity could be posed in a static position with shoulders hunched, in a fighting position. This static pose is predominantly a male posture.

Fig. 6 Gesture

Predominantly a male
& female gesture

Fig. 7 Posture

Predominantly a male
& female posture

X_7: Voice

The intended attribute is expressed by having the anthropomorphic entity speaks in a female or male voice. A male form can be normally expressed using a gruff or low-pitched voice, and a female form can be expressed in a high-pitched or sing-a-long voice.

States of Gender Perception and Expression

The perception of the intended gender forms by an anthropomorphic entity does not necessarily remain in a single state. That is, a human participant's perception of what the artificial entity's gender is can change over time. In various applications or functionality such as role-playing, teaching and training bots, it may even be desirable for the artificial entity to be capable of transiting from one gender to another throughout specific time intervals. However, to accomplish this, the perception of the human participants should mirror the intended gender forms as expressed by the artificial entity. In order to model the dynamism accurately, four major states have been identified.

S: Static

The intended gender form is expressed once and remains unchanged throughout the duration of the functionality. For example, a computer character in a teaching environment portrayal of a female (robot) nurse in a healthcare training scenario is expected to remain female throughout the whole training session.

D: Dynamic

The intended gender form is fluid throughout the duration of the functionality resulting in the artificial entity displaying an androgynous character.

$S_1 \rightarrow S_2$: Static to Static

The intended gender form changes from static gender state to another static gender form. This is desirable in functionality where the games scenario requires the gender to deliberately change from one state to another. This should not be confused with *D: dynamic* gender state where the gender forms transit so frequently that the human participants cannot determine what gender it is. *$S \rightarrow S$: static to static,* however, clearly and deliberately expresses accurately its intended gender forms each time it changes its state. This feature is desirable in application where gender roles change to demonstrate lessons, for example, drama lessons.

$S_1 \rightarrow D \rightarrow S_2$: Static Progressive

The intended gender form commences with an accurate portraying of the intended gender, but enters a dynamic state. In the dynamic state, it fluctuates as defined in *D: dynamic* and then settles into a static state. The final gender form can be in its original state when it first commenced or settling into a different form.

C: Combination

Any of the above states can be combined to allow for a single anthropomorphic entity to display different gender forms in a given time frame.

Modelling

Each of the classification of the previous discussed gender forms is categorised into different membership functions based on fuzzy logic (Zadeh 1996) modelling (which is the subject of a further publication). This can be formulated as follows:

$$f_{\text{expression}}(X) = \text{Gender}_{\text{perception}}[\text{male, female}] \tag{1}$$

where $X = \{X_1, X_2, X_3, X_4, X_5, X_6, X_7\}$ as defined in the previous section. And by inserting this into states as defined in (1), we further obtain as follows:

$$S(f_{\text{expression}}(X)) = \text{Gender}_{\text{perception}}[\text{male, female}] \tag{2}$$

$$D(f_{\text{expression}}(X)) = \text{Gender}_{\text{perception}}[\text{male, female}] \tag{3}$$

$$\begin{aligned} S_1(f_{\text{expression}}(X)) \rightarrow S_2(f_{\text{expression}}(X)) &= \text{Gender}_{\text{perception 1}}[\text{male, female}] \\ &\rightarrow \text{Gender}_{\text{perception 2}}[\text{male, female}] \end{aligned} \tag{4}$$

$$\begin{aligned} S_1(f_{\text{expression}}(X)) \rightarrow D(f_{\text{expression}}(X)) \rightarrow S_2(f_{\text{expression}}(X)) \\ = \text{Gender}_{\text{perception 1}}[\text{male, female}] \\ \rightarrow \text{Gender}_{\text{perception } D}[\text{male, female}] \\ \rightarrow \text{Gender}_{\text{perception 2}}[\text{male, female}] \end{aligned} \tag{5}$$

Experiment

To evaluate and measure the viability of the different classifications of gender forms expressed by anthropomorphic entities presented in this paper, a test platform needs to be designed. However, due to the unique nature of the project and its application to serious games application, a conventional methodology is not readily available through questionnaires or any data collection survey. This is resolved by employing *Pepper*, an intelligent autonomous mobile robot developed by SoftBank Robotics (Softbank Robotics). Pepper is an intelligent autonomous robot that is capable of reading human emotions (Fig. 8). Through a series of bio-inspired inference functionality, it is also able to respond in-kind. It is capable of reacting to human emotions and its environment. For example, Pepper can express concern when the lights in a room are dimmed or when a crowd suddenly goes quiet. Pepper provides feedback to human participants via its display unit mounted on its chest. This display unit is a capable of displaying its current state using waveforms, colours and a programmable graphical interface.

Photo Credit: SoftBank Robotics

Fig. 8 Pepper, autonomous robot that is capable of reading human emotions

Crowd Sourcing Mass Participant Feedback

In massive real-time data gathering of user feedback, conventional data collection methods such as questionnaires and surveys are impractical and inefficient for the purpose of this project. Therefore, a recent and novel method of data gathering has been designed through the use of crowd sourcing (McDuff et al. 2011; Tan et al. 2013). For the purpose of this project, two Pepper robots were employed. During Open Day and Expo organised by Central Queensland University at several of its campuses, Pepper robots have been allowed to roam freely to interact with the public. The public composed mostly of adults from diverse background and schoolchildren. One robot was programmed to explicitly change its states from *S* to *D* and in reverse in every one hour. The other robot was programmed to randomly switch between all states defined in (1)–(5). The public mingled randomly with the robots. The activities between human participants and Pepper robots were touching, talking, joking, dancing and singing. The interaction and engagement for the two robots were over the span of four hours. Due to the random and casual nature of the interactions, there was no tally or statistics being recorded. All records of the interaction became part of the reinforcement of the Pepper robots' learning function.

Initial Test Results and Further Work

As this is a pilot study, the initial test results from the above experiment showed that human participants accurately perceived all the expressions gender types within the range of X_1, X_2, X_3, X_4, X_5, X_6, X_7. The results were measured through a

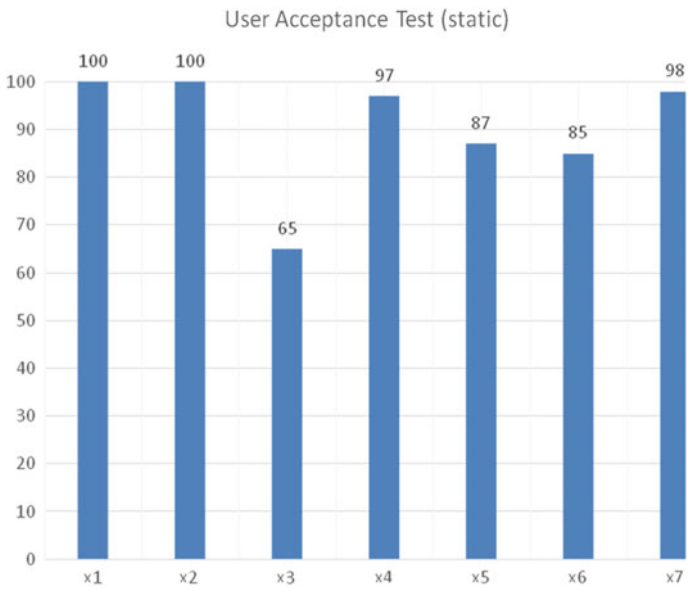
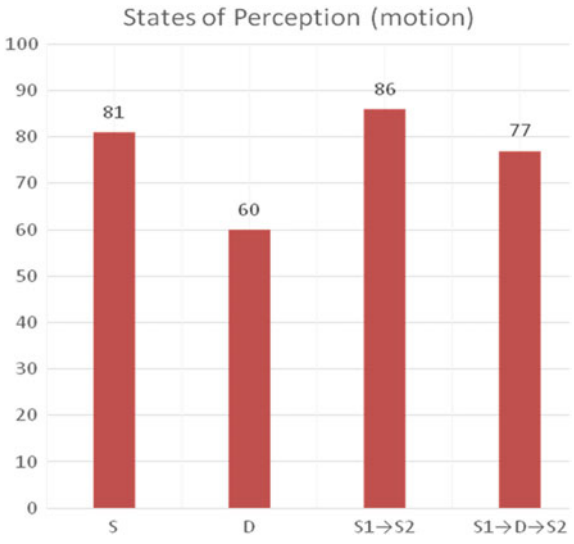


Fig. 9 User acceptance of the classification of digital gender forms

Fig. 10 User acceptance of the different states of digital gender perception in motion



qualitative inspection of Pepper's neurological modules and intuition data bank. The initial results of user acceptance are shown in Figs. 9 and 10. As this is a pilot study, there needs to be a more systematic approach in measuring robots using reinforced parameters for all the different gender types as proposed in this project.

Summary

This paper has classified different gender forms according to how the entity presents itself to human participant, especially when used in teaching and learning activities using artificial entities. In turn, the perception of how convincing the expression is is also measured using an autonomous robot capable of social interaction. A method of evaluating user reaction is through the novel method of crowd sourcing mass human responses. This pilot study and initial result from observation showed that the different classifications of gender forms are useable.

References

Boston dynamics: Dedicated to the science and art of how things move. http://www.Bostondynamics.com. Web, May 24, 2016 (N.p., 2016).

Chiou, A., Lye, N. C., & Wong, K. W. (2013). Gamification of commonplace learning activities: A case study in educational robotics in competitive arenas. In *Proceedings of TARC International Conference on Learning and Teaching: Innovation and Transformation in Learning and Teaching*. Kuala Lumpur, Malaysia: Tunku Abdul Rahman University College.

Lye, N., Wong, K., & Chiou, A. (2011). *Framework for educational robotics: A multiphase approach to enhance user learning in a competitive arena*. Paper presented to the 6th International Conference on E-learning and Games, Edutainment 2011, Taipai, Taiwan, 7–9 September, 2011

McDuff, D., El Kaliouby, R., & Picard, R. (2011). Crowdsourced data collection of facial responses. *Proceedings of the 13th International Conference on Multimodal Interfaces—ICMI'11, 2011*

Muoio, D. This Humanoid robot might travel to space to help astronauts. *Tech Insider*. Web, May 24, 2016 (N.p., 2016).

Norman, D. (1986). Cognitive engineering. In D. Norman & S. W. Draper (Eds.), *User centered systems design* (pp. 31–62). Hillsdale, NJ: LEA.

Softbank Robotics, http://www.softbank.jp Web, May 24, 2016 (N.p., 2016).

Tan, C. T., Rosser, D., & Harrold, N. (2013). Crowdsourcing facial expressions using popular gameplay. *SA'13 SIGGRAPH Asia 2013 technical brief article no. 26.* New York: ACM.

Zadeh, L. (1996). Fuzzy logic—Computing with words. *Fuzzy Systems, Trans.*, (2), 103–111

Part III
Curriculum Enhancement and Pedagogical Models

Cynicism Toward Educational Change on Teacher Satisfaction: The Contribution of Situational and Dispositional Attribution

Joanne Sau-Ching Yim, Priscilla Moses and Siew Chee Choy

Abstract The Malaysia Education Blueprint 2013–2025 is a major education transformation effort in Malaysia. This study examines the effect of teachers' cynicism toward this blueprint on their job satisfaction. Cynicism toward educational change is investigated through the lens of Attribution Theory, where the components of situational and dispositional attribution of cynicism were measured. Data were collected from 628 practicing teachers and selected through cluster sampling from a school district in Malaysia. Two well-established instruments were used, the Job in General (JIG) scale to measure job satisfaction and the Cynicism About Organisational Change (CAOC) scale to measure cynicism caused by situational attribution and dispositional attribution. The prevalence of teachers' cynicism toward the blueprint is examined with descriptive analysis, and hierarchical regression is used to determine the relationships and contribution of cynicism as predictor of teachers' satisfaction. Findings are discussed with implications that may contribute toward successful educational change.

Keywords Cynicism toward change · Attribution Theory · Job satisfaction · Educational change · Malaysia Education Blueprint 2013–2025

J.S.-C. Yim (✉) · S.C. Choy
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: yimsc@tarc.edu.my

S.C. Choy
e-mail: choysc@mail.tarc.edu.my

P. Moses
Universiti Tunku Abul Rahman, Kampar, Malaysia
e-mail: priscilla@utar.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_15

Introduction

The Malaysia Education Blueprint 2013–2025 (MEB 2013–2025) is currently the signatory education reformation package offered by the current government. It is described as the biggest manifestation of government transformation so as to get the best returns in human capital to drive all national development aspirations. The blueprint offers comprehensive transformation programs with 11 improvement thrusts to enhance outcomes of education (Ministry of Education [MOE] 2013). One of the thrusts is to specifically "transform teaching into the profession of choice" (MOE 2013, p. E-14), an emphasis to attract top academic achievers to become teachers to propel the country's education performance (MOE 2013). As the country heads toward a developed nation in 2020, this blueprint can well be the final thrust toward the realization of this vision. However, it has been observed that not all reforms have been entirely successful. Some of the less successful ones have been left unexplained while other newer initiatives are introduced (Malakolunthu 2010). Some of the reforms have not achieved the impact it purported to produce, with u-turns carried out in the form of major policy changes (Hallinger 2010; Malakolunthu 2010). For example, the medium of instruction for science and mathematics initially in Malay was changed to English, and then back to Malay again due to the deterioration of student performance for both subjects (Rokiah et al. 2012). Similarly, efforts toward implementing ICT in education also did not manifest clear success in improving student performance. The government has invested about RM 6 billion in this area in the past decade, yet a UNESCO report revealed that ICT usage in schools still fall short where computer use in the classroom has not gone beyond being used as a word processing tool (MOE 2013). Not all changes are ideal, and past changes that were not successful can leave teachers extremely wary about accepting further attempts of change, predisposing cynicism toward future changes (Greenberg and Baron 2000; Wanous et al. 2000).

Qian and Daniels (2008) suggest that cynicism toward change is a passive barrier to organizational change. Investigations into this construct are important, especially in Malaysia, where cultural norms of high power distance and collective attributes result in stakeholders' inclination to accept educational change without resistance in order to preserve group harmony (Hallinger 2010). This tendency to avoid public dissent may result in suppressed disagreement and delay change adaptation (Hallinger 2010). Reichers et al. (1997) suggest employees do not simply decide to be cynical, as their cynicism is developed through experience, and persists due to mixed record of successful and unsuccessful changes, and may be influenced by other people who have similar cynical views. Such context of change has led scholars to conceptualize Cynicism About Organisational Change (CAOC) to be a learned response rather than a personality trait (Johnson and O'Leary-Kelly 2003; Wanous et al. 2000). The study on cynicism toward change is important as it is a negative attitude toward change which can persist over time and decrease the likelihood of future change success (Rafferty and Restubog 2016).

The current study adopts the CAOC scale which consisted of two components: (1) pessimistic viewpoint about change being successful and (2) blaming people responsible for change for likelihood of failure of change (Kath 2005; Wanous et al. 2000). This scale was developed with reference to Attribution Theory which proposes the tendency for people to attribute two types of factors to an observed outcome: situational factors and (or) dispositional factors (Heider 1958; Wanous et al. 2000). Situational factors are aspects beyond the control of a person which may affect change such as unexpected change in policies, while dispositional factors are factors dependent on individual such as competency and ability of managers in bringing about successful change. The effect of dispositional factors of school management during educational change cannot be undermined as research has shown that sensitivity and sincerity of school management can potentially alleviate cynicism among teachers (Konakli 2016). Based on the theoretical foundations of Attribution Theory, the present study evaluates the two components of CAOC, with "Pessimism" reflecting cynicism caused by situational attribution and "Cynicism Toward Management" describing cynicism caused by dispositional attribution.

Researchers in educational change noted that there is a global trend of educational reform overload, which intensifies teachers' work and affects their job satisfaction (Fullan 2007). Even though research has advanced us in the understanding of teachers' job satisfaction, it remains a primary concern when new changes are introduced. As local scholars noted, investigation of teachers' opinions during change is important to avoid change implementation being a "self-deceiving public exercise of education reform and a waste of energy and resources" (Nurul-Awanis et al. 2011, p. 110). The inclusion of cynicism in investigating job satisfaction is supported by studies that found negative correlations between organizational cynicism and job satisfaction (Arabaci 2010; Volpe et al. 2014), while meta-analyses have noted an effect size of 0.58 true score correlation (Chiaburu et al. 2013). Other researchers have suggested that organizational cynicism has resulted in a decrease of job satisfaction level in the last decade (Nafei 2013). Hence, an investigation into teachers' cynicism toward change would be timely with the implementation of MEB 2013–2025.

Statement of the Problem

This study aims to investigate the effect of teachers' cynicism toward educational change on their job satisfaction. While studies have improved our understanding of teachers' satisfaction, there is a paucity of studies about their cynicism toward educational reformation. Prolonged and widespread cynicism could potentially become a precursor to more aggressive expression of dissent such as resistance to change (Qian and Daniels 2008). Hence, it is important to examine teachers' opinion during educational change as they are the primary agents who are tasked to

implement changes. It must be noted that a majority of studies done on cynicism have focused on organizations in Western countries (Mohd Noor et al. 2013); hence, the findings from this study will contribute to bridging this literature gap in southeast Asian countries.

Objectives of the Study

Three research questions (RQ) underpin the current study:

RQ1 What is the level of cynicism among teachers toward the MEB 2013–2025?
RQ2 Is there any relationship between teachers' cynicism toward the MEB 2013–2025 and their job satisfaction?
RQ3 What is the relative contribution of Pessimism and Cynicism Toward Management as predictors of teacher job satisfaction?

The first RQ sought to descriptively examine the prevalence of change cynicism toward MEB 2013–2025 in an educational district. The second RQ tested the relationship between change cynicism and job satisfaction, and RQ3 investigated the relative contribution of Pessimism and Cynicism Toward Management as predictors of job satisfaction.

Research Method

A cross-sectional design was used in this study. Permission to adopt and adapt the questionnaire was sought and granted by the authors of the scales used in this study. Ethical procedures were adhered to with permissions obtained from the university which the authors are attached to for data collection. Permission to collect data was also sought and granted by the relevant authorities in the Ministry of Education at the federal, state, district, and school level. The instrument consisted of three sections: (1) Participants' demographic profile, (2) CAOC scale (Wanous et al. 2000), and (3) JIG scale (Brodke et al. 2009). Permission to use the scales was sought and obtained. The CAOC consisted of eight negative worded items which measures Pessimism (four items) and Cynicism Toward Management (four items) with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Higher scale mean score indicates higher cynicism (Wanous et al. 2000). The JIG consisted of 18 items, the original scoring format offered a three-point option to indicate the extent participants agree with the scale items, and satisfaction level is determined by sum of scale mean score. The scoring format as suggested by the authors of the instrument is depicted in Table 1.

Table 1 Categorization of measurement levels of scales used

Scale	Score	Categorization of levels
CAOC	1.00–2.50	Low cynicism
	2.51–3.49	Moderate cynicism
	3.50–5.00	High cynicism
JIG	0–22	Dissatisfaction
	23–31	Ambivalent
	32–54	Satisfaction

Results/Discussions

Data from 628 practicing teachers (483 females, 145 males) were analyzed in this study. The participants were selected through cluster sampling from a school district in Malaysia. All participants were informed that they could withdraw from the study at any time, and their identity will be kept in confidence. The participants' age ranged from 20 to 58 years, with a mean age of 39 years (SD = 1.03). Their weekly workload ranged from 11 to 50 h per week and averaged at 36 h (SD = 1.54). Their teaching experience was spread out from 1 to 35 years with a mean of 14 years (SD = 1.77). In terms of highest qualifications attained, 37 (5.9%) possess a postgraduate qualification, 383 (61.0%) have a bachelor degree, and 208 (33.1%) have a diploma. The Cronbach's coefficient alpha obtained for CAOC and JIG was 0.92 and 0.89, respectively.

In answering RQ1, teachers were found to be moderately cynical toward the MEB 2013–2025 with a scale mean of 3.23 (SD = 0.85). This confirmed that cynicism is a norm in organizations as suggested by Nafei (2013). The descriptive information obtained for the items measured by the CAOC scale is shown in Table 2. To answer RQ2, Pearson correlation indicated a significant inverse relationship between cynicism toward MEB 2013–2025 and job satisfaction ($r = -0.35$, $p < 0.05$). Results concurred with research that suggested the potential relationship of CAOC and job satisfaction (Arabaci 2010; Chiaburu et al. 2013).

In addressing RQ3, hierarchical regression analysis was used and some possible confounding variables such as gender, age, tenure, and workload were controlled for because participants were working in the same school district and performing similar duties, but varied in these demographic factors. As shown in Table 3, the demographic control variables were entered into Step 1, $F(4, 623) = 2.07$, and failed to account for a significant amount of variance in job satisfaction. To enable an appraisal of each component's effects, the Pessimism component was first entered into Step 2, because literature had shown it to be more meaningful in explaining job satisfaction (Polat and Gungor 2014). Pessimism explained 24.3% of the total variance in job satisfaction with an additional 22.9% of the variance explained after controlling for demographic factors, R^2 change = 0.229, $F(5, 622) = 16.30$, $p < 0.001$. Cynicism Toward Management was entered into Step 3, and the model as a whole accounted for 32.1% of the variance in job satisfaction.

Table 2 Descriptive information for cynicism toward change

Item	Strongly disagree (%)	Disagree (%)	Not sure (%)	Agree (%)	Strongly agree (%)	Mean	SD
Most of the programs that are supposed to solve problems around here will not do much good	1.80	13.90	20.50	42.60	21.20	3.68	1.01
Attempts to make things better around here will not produce good results	4.90	37.10	23.40	27.60	7.00	2.95	1.06
Suggestions on how to solve problems will not produce much real change	3.70	31.50	24.10	31.80	8.90	3.11	1.06
Plans for future improvement will not amount to much	6.80	36.80	23.70	25.70	7.00	2.89	1.08
The people responsible for solving problems around here do not try hard enough to solve them	2.40	25.20	18.80	37.30	16.30	3.40	1.10
The people responsible for making things better around here do not care enough about their jobs	3.20	29.60	27.20	29.50	10.50	3.14	1.06
The people responsible for making improvements do not know enough about what they are doing	2.40	24.20	24.20	35.20	14.00	3.34	1.07
The people responsible for making changes around here do not have the skills needed to do their jobs	3.50	22.00	28.50	30.30	15.70	3.33	1.09

This component explained an additional 7.2% variance in job satisfaction, R^2 change = 0.072, $F(6, 621) = 15.70$, $p < 0.001$. The changes in R^2 for both components were significant, indicating that they account for a significant proportion of the variance of job satisfaction. Between these two components, Pessimism explained the larger variance in job satisfaction, affirming findings in earlier literature that this component has more influence than Cynicism Toward Management on job satisfaction (Polat and Gungor 2014).

Table 3 Relative contribution of Pessimism and Cynicism Toward Management as predictors of job satisfaction

Independent variables	Step 1		Step 2		Step 3	
	β	SE	β	SE	β	SE
Constant						
Gender	−0.04	0.06	−0.04	0.05	−0.03	0.05
Age	−0.06	0.05	−0.11	0.05	−0.12	0.04
Tenure	0.12	0.03	0.13	0.05	0.12	0.03
Workload	−0.09*	0.02	−0.10	0.01	−0.09	0.01
Pessimism			−0.48**	0.03	−0.45**	0.03
CAOC—Mgt					−0.28**	0.02
	R^2 = 0.01		R^2 = 0.243**		R^2 = 0.321**	
			ΔR^2 = 0.229**		ΔR^2 = 0.072**	

n = 628, *p < 0.01, **p < 0.001
CAOC—Mgt: Cynicism Toward Management

Implications of the Study

This study highlighted the prevalence of cynicism during educational change, adding to the existing knowledge of teachers' opinion toward major education reformation (Yim and Moses 2016). One of the items in the scale, "Most of the programs that are supposed to solve problems around here will not do much good" scored the highest item mean, indicating teachers to be cynical about the effectiveness of the improvement programs in schools. This constitutes an important finding as teachers are involved in delivering these programs. This suggest that the efficacy of these programs needs to be monitored (Yim and Moses 2016), as some 100 of them are implemented annually in certain districts, leading to a lack of focus, burdening teachers, and constraining financial resources (MOE 2013).

Apart from confirming the potential relationship between change cynicism and job satisfaction, the current study delves deeper into this notion by examining the relative importance of the components of CAOC as predictor variables of job satisfaction. The Pessimism component reflects situational factors beyond the control of management, while Cynicism Toward Management reflects the attribution placed on management for likely failure of change. Both components significantly predicted job satisfaction with the former component having a larger influence. Hence, situational factors of change may have precedence over the dispositional traits of management when addressing cynicism toward change (Yim and Moses 2016). CAOC in the context of the current study could be managed as it is a learned response and not a personality trait, and findings implied that importance of change management. During periods of change which often involve uncertainty, employees observe the behaviors and actions of management in an effort to make sense of change (Rafferty et al. 2013). Situational context of change could affect teachers' job satisfaction as shown in a recent cross-national study,

where education reforms that were not fully implemented had burdened teachers and eroded their job satisfaction (Liu and Onwuegbuzie 2014). While adjustments may be necessary in the course of education reform, practical implications here suggest that management or change proponents have to reveal the adjustment made to initial reformation plans to chart the change progress to teachers. Teachers who are involved in executing changes should be constantly updated to make sense of their involvement in reforms. Other situational remedies for cynicism include the improvement of working conditions and benefits (Abraham 2000), to imply positive outcomes brought by the changes. Change proponents may consider such remedies by having revisions of teachers' benefits and remuneration with the introduction of major educational reforms. Such revisions are within the jurisdiction of the Ministry of Education and could be improved on to alleviate cynicism.

Alternatively, Cynicism Toward Management can be decreased by including teachers extensively in making decision in the change process (Volpe et al. 2014). Attribution Theory includes the notion of "self-serving bias," which describes the inclination of people blaming external factors for failures, and rarely sees themselves as contributors to the failures (Heider 1958; Wanous et al. 2000). Hence, involving teachers in the change process will alleviate their Cynicism Toward Management in the event of negative outcomes as they will have to take ownership of the outcomes concerned (Yim and Moses 2016).

Lastly, job satisfaction may be alleviated when change cynicism is addressed as suggested by the inverse relationship found between the two components of cynicism (Pessimism and Cynicism Toward Management) and job satisfaction. As change cynicism comes about through work experiences (Wanous et al. 2000), employees who fail to see improvements in their jobs from proposed changes may direct their resentment toward the job itself and become dissatisfied (Abraham 2000). It is thus apparent logic that teachers' job satisfaction can improve if the changes proposed in the MEB 2013–2025 bring about improvements it purports to produce (Yim and Moses 2016).

Limitations

Part of the limitations of the current study is that data are collected by way of self-reporting surveys, and it was assumed that participants would honestly respond to the survey items. Inevitably, some degree of subjectivity would be inherent in the data collected. Other observational measures from different sources and methods can be utilized to triangulate and support the validity of self-report measures, and to add to the richness of these quantitative findings. Besides, the investigation is carried out in an educational district and findings might not be generalizable to other districts.

Conclusions

This study looks at cynicism during educational change through the lens of Attribution Theory. Cynicism is a common reaction among employees during change, and this study found it to be also prevalent during educational change. Situation-induced cynicism was found to have a larger variance in predicting job satisfaction compared to within person-induced factors. As cynicism toward change is predisposed by prior change attempts, the management or change proponents need to deal with previous experiences before implementing new ones. In the course of change implementation, it may also be good practice to provide some direction of change with constant updates of change outcomes. Instead of announcing comprehensive change results at the end, small successes that are revealed continually may imply positive directions of change (Yim and Moses 2016).

References

Abraham, R. (2000). Organizational cynicism: Bases and consequences. *Genetic, Social, and General Psychology Monographs, 126*(2), 269–292.

Arabaci, B. (2010). The effects of depersonalization and organizational cynicism levels on the job satisfaction of educational inspectors. *African Journal of Business Management, 4*(13), 2802–2811.

Brodke, M. R., Sliter, M. T., Balzer, W. K., Gillespie, J. Z., Gillespie, M. A., Gopalkrishnan, P., et al. (2009). *The job descriptive index and job in general quick reference guide 2009 revision*. OH: Bowling Green University.

Chiaburu, D. S., Peng, A. C., Oh, I., Banks, G. C., & Lomeli, L. C. (2013). Antecedents and consequences of employee organizational cynicism: A meta-analysis. *Journal of Vocational Behavior, 83*(2), 181–197.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). NY: Teachers College Press.

Greenberg, J., & Baron, R. A. (2000). *Behaviour in organisations* (7th ed.). Upper Saddle River, NJ: Prentice Hall.

Hallinger, P. (2010). Making education reform happen: Is there an 'Asian' way? *School Leadership & Management, 30*(5), 401–418.

Heider, F. (1958). *The psychology of interpersonal relations*. New York: Wiley.

Johnson, J. L., & O'Leary-Kelly, A. M. (2003). The effects of psychological contract breach and organizational cynicism: Not all social exchange violations are created equal. *Journal of Organizational Behavior*, *24*, 627–647. doi:10.1002/job.20

Kath, L. M. (2005). *How cynicism about organizational change can influence the effectiveness of socialization training* (Doctoral dissertation). ProQuest Dissertation and Theses database. (UMI No. 3180218).

Konakli, T. (2016). The effect of school administrators' political skills against organizational cynicism in educational organizations. *Universal Journal of Educational Research*, *4*(3), 589-597. doi:10.13189/ujer.2016.040317

Liu, S., & Onwuegbuzie, A. J. (2014). Teachers' motivation for entering the teaching profession and their job satisfaction: A cross-cultural comparison of China and other countries. *Learning Environments Research*, *17*(1), 75–94. doi:10.1007/s10984-013-9155-5

Malakolunthu, S. (2010). Implementation of education reform policies: The issue of structural and cultural discordance. In J. Zajda (Ed.), *Globalisation, ideology and education policy reforms* (pp. 79–85). London: Springer Science & Business Media.

Ministry of Education. (2013). *Malaysia education blueprint 2013-2025 (Preschool to post-secondary education).* Retrieved from http://www.moe.gov.my

Mohd Noor, N. A., Mohd Walid, Z., Ahmad, F., & Darus, A. (2013). *Sinisme di kalangan kakitangan akademik insitusi pengajian tinggi awam (IPTA) di Malaysia: Sejauhmana ia mempengaruhi niat untuk menentang perubahan? [Cynicism among academic staff members of public higher education institutions in Malaysia: To what extend does it influence intention to resist change?].* Paper presented at the Global Conference on Business, Economics and Social Sciences, Kuala Lumpur, Malaysia. Retrieved from http://www.worldresearchconference.com

Nafei, W. A. (2013). Examining the relationship between organizational cynicism and organizational change: A study from Egyptian context. *Journal of Business Administration Research*, *2*(2).

Nurul-Awanis, A. W., Hazlina, A. H., Yoke-May, L., & Zariyawati, M. A. (2011). *Malaysian education system reform: Educationists' perspectives*. Paper presented at the International Conference on Social Science, Economics and Art, Putrajaya, Malaysia. Retrieved from: International Scientific Conference.

Polat, S., & Gungor, G. (2014). Relationship between organizational change cynicism and some variables in Turkish public schools. *Anthropologist, 18*(3), 1019–1027.

Rafferty, A. E., Jimmieson, N. L., & Restubog, S. L. (2013). When leadership meets organizational change: The influence of the top management team and supervisory leaders on change appraisals, change attitudes, and adjustment to change. In S. Oreg, A. Michel, & T. R. By (Eds.), *The psychology of organizational change: Viewing change from the employee's perspective* (pp. 145–172). Cambridge: Cambridge University Press.

Rafferty, A. E., & Restubog, S. L. (2016). Why do employees' perception of their organization's change history matter? The role of change appraisals. *Human Resource Management*, Advance online publication. doi:10.1002/hrm.21782

Reichers, A. E., Wanous, J. P., & Austin, J. T. (1997). Understanding and managing cynicism about organizational change. *The Academy of Management Executive, 11*(1), 48–59.

Rokiah, R. A., Majid, N., Mamat, N. J., Rambely, A. S., Muda, N., Jaaman, S. H., et al. (2012). Transformation of language in teaching and learning policy. *Procedia Social and Behavioral Sciences*, *59*, 685–691.

Qian, Y., & Daniels, T. D. (2008). A communication model of employee cynicism toward organizational change. *Corporate Communications, 13*(3), 319–332.

Volpe, R. L., Mohammed, S., Hopkins, M., Shapiro, D., & Dellasega, C. (2014). The negative impact of organizational cynicism on physicians and nurses. *The Health Care Manager*, *33*(4), 276–288. doi:10.1097/HCM.0000000000000026

Wanous, J. P., Reichers, A. E., & Austin, J. T. (2000). Cynicism about organizational change: Measurement, antecedents and correlates. *Group and Organization Management, 25*(2), 132–153.

Yim, J. S. C., & Moses, P. (2016). Work factors and teacher satisfaction: The mediating effect of cynicism toward education change. *Issues in Educational Research*, *26*(4), 694–709. Retrieved from http://www.iier.org.au/iier26/yim.pdf

Exploring the Impact of International Student Mobility on Cross-Cultural Learning Adaptation

M. Foster

Abstract Recent developments in globalisation of higher education encourage increased student mobility. This talk examines the extent to which international student mobility exerts an impact on cross-cultural learning adaptation of the students in new learning environments. Informed by an innovative, cross-faculty study involving international academics from business and design, the learning experiences of students from China studying business in the UK and students from the UK studying design in China are explored. Using Kolb's theory of experiential learning to frame the study, and corresponding to the key features of the learning in cross-cultural conceptualisation proposed by Cortazzi and Jin, seven themes of adaptation of students' learning styles are identified including students' perceptions and response to good teaching, good learning, peers and assessment. Each plays an important role in facilitating effective engagement with learning in the new learning environment. Guidelines for systematic, pre-mobility, intercultural skills development are suggested to ensure maximum benefits from study abroad. This paper informs the design of student mobility programmes with aspects of intercultural empathy in the context of internationalised higher education.

Keywords Internationalisation · Student mobility · Cross-cultural learning adaptation

Introduction

The context for this paper is an increased internationalisation of learning and teaching in higher education (HE) worldwide (Knight 2006; Caruana and Spurling 2007) and specifically the ambition to internationalise student experience (Hyland et al. 2008). The specific interest is 'internationalisation' from the students'

M. Foster (✉)
School Academic Lead Learning and Teaching, The Business School Edinburgh
Napier University, Scotland, UK
e-mail: m.foster@napier.ac.uk

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_16

perspective as it focuses on 'academic learning that blends the concepts of self, strange, foreign and otherness' (Teekens 2006, p. 17). This view of internationalisation is also congruent with the perspectives of Appadurai (2001), Haigh (2014) and Sanderson (2011) who foreground the value of personal awareness in intercultural encounters in HE. The interest for this paper, within this context, is to examine the complexities underpinning the concept of culture of learning in student mobility through a non-essentialist lens. Informed by the rich, individual student perspectives, the objectives are to explore how students can benefit from cultural diversity through mobility and how this impacts their cross-cultural adaptation, a key contributor to the development of an intercultural capacity.

Research Problem

In the context of an increased student mobility and student exchanges (Prazeres 2013; Sweeney 2012), currently promoted by the universities, students are encouraged to experience different cultures in order to reflect on their own and to develop a sound understanding of other cultures of learning (Killick 2011). However, the differences between students' own and host cultures of learning, and particularly, students' misconceptions about the host culture of learning, can be problematic for students studying abroad, as well as for the HE faculty and staff associated with both the home and host universities (Vita 2001). This study attempts to address these mismatches in the expectations or perspectives of students and inform programme directors involved in student mobility programmes. Furthermore, these are the dynamic changes in our students' learning experiences, rather than cultural traits frozen in time, that inspired our research.

The qualitative study explores the evolving views of a small sample of 18 exchange students, not in an attempt to provide categorical 'truths', but to raise questions about how students learn in different cultures of learning through a detailed analysis in non-essentialist approach. Non-essentialist approach is seen as dynamic, complex, subjectively constructed, fluid, and importantly can be associated with non-national entities (Holliday 1999; Grimshaw 2007).

Objectives of the Study

The study reported here goes beyond existing understandings of 'cultures of learning' linked to China and the UK by opening perspectives on individual experiences to form insights that move from an essentialist view (Brown et al. 1989; Chisholm and Valley 1996). The intention is to identify areas of support that universities can provide for students participating in such internationalised

education. With aspects of intercultural empathy and an inclusive, flexible learning ethos, it could also inform initiatives for increased student mobility at university and beyond.

Using individual experiences rather than a large quantitative sample, the complexities and richness of 'culture of learning' are unpacked and explored with a specific focus on students' evolving perceptions of own and host learning cultures. Specifically, the researchers are interested in the students' perspectives of the foreign culture of learning, how the students' perspectives about the foreign culture of learning are different from their home culture of learning and how the students' perspectives of the foreign culture of learning change over time. These questions are addressed first through a non-essentialist and dynamic content analysis of interview results and students' learning journals. The themes arrived at from the analysis are then explored in relation to the multifaceted perspectives on student mobility, especially the cultural aspects of student mobility and how they can be explored and supported to ensure students fully benefit from the experience of study in a new learning and teaching context.

Research Methodology

Participants

Two different groups of exchange students were identified as research subjects: nine Chinese students coming to study in the UK from China, and nine UK students leaving the UK to study in China. The students involved in this study came from a diverse range of ethnic, cultural and economic backgrounds. The UK students included Scottish, Anglo-Chinese, Russian and Kurdish backgrounds. Similarly, Chinese students who took part in the study came from different cities in China, representing a spread of backgrounds. As mentioned above, none of the groups of students were given specific pre-departure training about the foreign culture of learning.

The sample size reflects the small number of students on the exchange programmes in the business school. The students are prepared for study abroad in terms of visas, fees, accommodation, etc., but there is little existing preparation regarding students' perspectives of foreign culture of learning and even their understanding of their own culture of learning. During study abroad, the design students in China are well supervised and are given opportunities to experience the host culture, both the academic and local culture. The business school students tend to be well looked after at the start of the study abroad but during the experience left largely to their own, without any structured introduction to both the academic and the local culture.

Data Collection Instruments

Following university ethical procedures, students were asked in advance to give their informed consent to participate in the study. Qualitative data was generated through in-depth interviews at the start and at the end of their study abroad experience, informed by students' reflective journals, which were undertaken longitudinally in parallel with the students' study in the host countries for four months. The questions for the interviews at the start and at the end of the study abroad can be found in the Appendix. Reflective journals are widely used to reflect on the 'encounters' or 'moments' or 'experiences', by briefly recording learning events and then reflect on the meaning of the experience for their own development and learning (Loo and Thorpe 2002; Wagner 2006).

In-depth, semi-structured interviews taking between 30 and 40 min were conducted with the students before their departure from the UK and at the end of the exchange in China. The Chinese students were interviewed at the start and at the end of their exchange in the UK. The students kept reflective learning journals. The participants were asked to use the journals whenever they felt inspired to, there were no fixed writing periods agreed to ensure the participant-led approach. There were no specific prompts provided what to record although the participants were encouraged to reflect on the 'encounters' or 'moments' or 'experiences', i.e., briefly record them and then reflect on the meaning of the experience for their own development/journey/learning. At the end of keeping their journals, students are asked to review themselves what they have gathered in their journals and write a 'final journal reflection', summarising main points and highlights.

Data Analysis

Content analysis followed by thematic sampling was conducted on the data from the interviews and reflective journals (Ortlipp 2008). This triangulation of data collection ensured that rich data was obtained and the varied sources of data provided an opportunity to look at the experience from varied angles, both researcher led and student led (Flick 2013). This study's non-essentialist approach and focus on individual, dynamic and evolving perceptions sees its reporting responses from relatively small amount of responses. This offers an opportunity for an in-depth exploration of experiences as seen through students' eyes, shining a new light on the complexities involved in student mobility regardless of essentialist national boundaries.

Results/Discussions

The results are grouped into seven distinct themes which arise from the process of thematic analysis of the interview transcripts and the analysis of journals: Expectations Of Good Teaching; Expectations About The Learning Process; Expectations About How To Interact With Lecturers; Perceptions Of Good Learning; Role Of Peers In The Learning Process; Assessment And Learning; and Preferred Form Of Assessment.

The themes correspond to the key features of the culture of learning conceptualisation proposed by Cortazzi and Jin (1996) and the results grouped according to the seven themes are discussed below. The presentation of the results strives to navigate the reader through the trends arrived from the data, emphasising the most common characteristics for the theme and how the students' perceptions changed over time. However, references to 'UK participants' and 'Chinese participants' are made for clarity and to explore the distinctions between home and host culture for these two groups of students.

The present study offers a unique insight into students' evolving perceptions of own and host culture of learning. It seems that students' perceptions of 'culture of learning' may be fluid rather than fixed, nationally bound objects. Their perceptions also seem to evolve in response to the change of the learning context which seems to be a stimulus for students to explore their own culture of learning and their host culture of learning. Furthermore, the boundary between what is traditionally perceived as the 'Chinese culture of learning' and the 'UK culture of learning' seems more blurred than being clear-cut. Both student groups seem to develop similar perceptions to a certain extent through shared experiences of cultures of learning.

Student mobility experience is often captured through academic assessments and rarely through other means such as reflective tools, which allow for the personal perspective to be prominent and for the intercultural skills development to be recognised. With careful preparation before student mobility, including the development of sound reflective skills, there is a potential additional benefit from the mobility experience in students engaging in ongoing reflection on their experience, which helps them to make sense of their own culture of learning, as well as of the host. Such reflective capture would become an important lens adding depth to our understanding of the richness of experience of students engaged in mobility. It may also serve as an important record of the evolving students' perceptions of own and host learning and teaching contexts which can be used as a promotional material to encourage students to take part in the mobility.

Contributions of the Study

This paper seeks to open and inform the debate to equip HE educators in a rapidly changing globalised society, especially the developments in encouraging global student mobility, and how educators can prepare for this new and growing area of international education. The emerging results point to the importance of study abroad as a key shaping experience for the students' evolving awareness of their own culture of learning and the hosts', hence developing an intercultural dimension to the overall study experience. This essential understanding of own and other cultures is one of the key features of a global citizen (Hyland et al. 2008).

Conclusions

For education providers wishing to increase student mobility, it seems necessary to ensure an effective preparation for students involved, including raising students' awareness of their own culture of learning and preparing students for the intercultural encounters prior to engaging in student mobility. This can be achieved by asking the returning exchange students to present a short video/slideshow describing their experiences studying and living on exchange to prospective exchange students. Another way institutions can prepare students would be through a buddy up scheme with returning exchange students. Finally, students should be equipped with sound independent study skills (Hyland et al. 2008).

Additionally, as motivating students to take part in increased mobility often relates to how they perceive long-term benefits from mobility (Brooks and Waters 2011), it is recommended to maximise capturing learning from study abroad experience through a number of mechanisms including getting students to record the experience of developing intercultural awareness and using it to enhance assessments from study abroad and enhance CV; sharing the experience online with other students; and visiting exchange students when they are abroad. Student assessment and moderation of marks on students return is an area which needs to be given attention, and this can be addressed as well as celebrating diversity in group work by breaking up clusters of students from the same university and integrating them into a broader international student cohort.

Appendix

Part 1: Interview Questions Before Study Abroad

- *Why have you chosen to go on exchange to a new academic environment?*
- *What information did you have to make this decision?*

[Questions particularly addressing expectations of 'culture of learning']

Suggested questions	Rationale
What are your expectations of 'good' lecturers?	These questions point to the 'teaching' dimension of 'culture of learning', as perceived by the participants regarding their experience in the home culture of learning
How do you expect your learning process to be structured, e.g. how much input should be provided by the lecturers in the form of conventional 'classes', how much weight should be put on self-directed learning/practice?	
How do you expect to interact/communicate with your lecturers in your learning process?	
What do you think constitutes 'good' learning? Can you think of any specific learning methods that a 'good' student typically adopts?	These questions point to the 'learning' dimension of 'culture of learning', as perceived by the participants regarding their experience in the home culture of learning
How do you see the role(s) that your fellow students play in your learning?	
How do you see the relationship between assessment and learning?	These questions point to the 'assessment' dimension of 'culture of learning', as perceived by the participants regarding their experience in the home culture of learning
How do you expect to be assessed in order to properly demonstrate the outcomes of your learning?	
How do you imagine your learning experience in the new academic environment would be like (give examples)?	These questions invite participants to construct the culture of learning in the host culture of learning
How are you preparing for studying in the new academic environment?	

[Ending questions]

- *What do you hope to achieve while on exchange in terms of your academic study and in terms of your personal development?*
- *What effect do you anticipate the exchange will have on how you approach learning once you are back home?*

Part 2: Interview Questions After Study Abroad

- *On a scale from −5 to +5, how would you rate your overall learning experience here? Why (give examples)?*
- *What information would you like to have had before the study in the UK?*

[Questions particularly addressing the experience of the 'culture of learning']

Suggested questions	Rationale
Following your experience in (host culture of learning), what are your expectations now of 'good' lecturers?	These questions point to the 'teaching' dimension of 'culture of learning', as perceived by the participants regarding their experience in the host culture of learning
How was your learning process structured, e.g. how much input was provided by the lecturers in the form of conventional 'classes', how much weight was on self-directed learning/practice?	
How did you interact/communicate with your lecturers in your learning process?	
What do you think now constitutes 'good' learning? Can you think of any specific learning methods that a 'good' student typically adopts?	These questions point to the 'learning' dimension of 'culture of learning', as perceived by the participants regarding their experience in host culture of learning
What role(s) did your fellow students play in your learning?	
What kinds of assessment did you undertake during your studies here?	These questions point to the 'assessment' dimension of 'culture of learning', as perceived by the participants regarding their experience in the host culture of learning
How do you see the relationship between assessment and learning now?	
How would you like to be assessed now in order to show that you have learnt something useful?	
How did learning experience in the new academic environment differ from what you imagined (give examples)?	These questions invite participants to construct the culture of learning in home culture of learning

[Ending questions]

- *What did you achieve while studying in the UK in terms of your academic study and in terms of your personal development?*
- *What effect will the study in the UK have on how you approach learning once you return home?*
- *Any other comments?*

References

Appadurai, A. (2001). *Globalization*. Durham.

Brooks, R., & Waters, J. (2011). *Student mobilities, migration and the internationalization of higher education*. Palgrave Macmillan.

Brown, J. S., Collins, A., & Duguid, P. (1989). Situated cognition and the culture of learning. *Educational Researcher, 18*(1), 32–42.

Caruana, V., & Spurling, N. (2007). The internationalisation of UK higher education: A review of selected material. *Higher Education Academy*.

Chisholm, L., & Vally, S. (1996). *The culture of learning and teaching in Gauteng schools: Report of the committee on the culture of learning and teaching*. Education Policy Unit, University of the Witwatersrand.

Cortazzi, M., & Jin, L. (1996). Cultures of learning: Language classrooms in China. In H. Coleman (Ed.), *Society and the language classroom* (pp. 169–206). Cambridge: Cambridge University Press.

Flick, U. (Ed.). (2013). *The SAGE handbook of qualitative data analysis*. Sage.

Grimshaw, T. (2007). Problematizing the construct of 'the Chinese learner': Insights from ethnographic research. *Educational Studies, 33*(3), 299–311.

Haigh, M. (2014). From internationalisation to education for global citizenship: A multi-layered history. *Higher Education Quarterly, 68*(1), 6–27.

Holliday, A. (1999). Small cultures. *Applied Linguistics, 20*(2), 237–264.

Hyland, F., Trahar, S., Anderson, J., & Dickens, A. (2008). *A changing world: The internationalisation experiences of staff and students (home and international) in UK higher education*. Higher Education Academy. Available from: http://escalate.ac.uk/downloads/5248.pdf. Accessed March 29, 2014.

Killick, D. (2011). Seeing ourselves-in-the-world: Developing global citizenship through international mobility and campus community. *Journal of Studies in International Education*. doi:10.1177/1028315311431893

Knight, J. (2006). *Internationalization of higher education: New directions, new challenges (IAU 2nd Global Survey report)*. Paris: IAU.

Loo, R., & Thorpe, K. (2002). Using reflective learning journals to improve individual and team performance. *Team Performance Management: An International Journal, 8*(5/6), 134–139.

Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report, 13*(4), 695–705.

Prazeres, L. (2013). International and intra-national student mobility: Trends, motivations and identity. *Geography Compass, 7*(11), 804–820.

Sanderson, G. (2011). Internationalisation and teaching in higher education. *Higher Education Research & Development, 30*(5), 661–676.

Sweeney, S. (2012). Going mobile: Internationalisation, mobility and the European Higher Education Area. URL (consulted June 2014): http://www.heacademy.ac.uk/resources/detail/internationalisation/Going_Mobile

Teekens, H. (2006). *Internationalisation at home: A global perspective*. The Hague: NUFFIC.

Vita, G. D. (2001). Learning styles, culture and inclusive instruction in the multicultural classroom: A business and management perspective. *Innovations in Education and Teaching International, 38*(2), 165–174.

Wagner, K. (2006). Benefits of reflective practice. *Leadership, 36*(2), 30–32.

The Use of Online Videos to Support Mathematics Education for Pre-service Educators: How Much "Face" Should I Show?

Kevin Larkin

Abstract One of the key drivers underpinning mathematics education in general, and more specifically mathematics education at a university level, is the use of Web 2.0 technologies to support the delivery of courses to undergraduate, primary pre-service teachers (PSTs) who often form part of large cohorts of students studying education. It is now unusual to find a mathematics education courses at Australian universities that do not incorporate online course delivery elements. Unfortunately, the drive online has not always been matched with a complementary drive to support developments in online pedagogy, and thus, mathematics educators are often in the position of delivering online content with little or no professional development to support a new form of pedagogy required in this context. This chapter examines the use of various combinations of online lectures (namely, full video, part video or no video) to support the development of content and pedagogical knowledge of PSTs. In addition, and just as critically, the lectures were a component of a course that had the second aim of enhancing the affective experience of mathematics for these PSTs. Data to support the claims made in this chapter are from PST feedback using an anonymous online survey and also from data collected by EchoCapture software, a component of the learning management system (LMS) used by the university in which this research took place.

Keywords Adult pedagogy · Blended learning · Mathematics education · Online education · Video lectures

K. Larkin (✉)
School of Education and Professional Studies,
Griffith University, Queensland, Australia
e-mail: k.larkin@griffith.edu.au

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_17

Introduction

In recent times, school mathematics education has played a significant role in delivering detrimental outcomes for future pre-service teachers (PSTs) in terms of their attitude towards mathematics. For example, Rubinstein (2009) in a report prepared for the group of 8 Australian universities indicated that there is a negative trend in relation to the number of students studying undergraduate mathematics. This claim is supported by the Australian Association of Mathematics Teachers (AAMT 2006) who have also indicated concern regarding the low level of enrolment in senior school mathematics courses which may prevent our young citizens from pursuing careers at university and beyond which require mathematics. The low level of enrolment in upper secondary and tertiary mathematics courses may also be a reflection of the negative attitudes that many students have towards mathematics in secondary schooling (Grootenboer and Hemmings 2007) and, increasingly, from as early as Year 3 or 4 (Larkin and Jorgensen 2015).

These negative outcomes are often worsened by the inappropriate use of Web 2.0 technologies in university mathematics education where courses are offered either fully or partially online with little change to modes of transmission that were appropriate in face-to-face contexts but which do not engage PSTs sufficiently in online modes. For a range of reasons, online lectures are becoming a staple of most Australian universities offering of mathematics education courses. These reasons include economic imperatives as it is often seen as more financially viable to offer online courses to large cohorts. In addition, it is claimed by university leaders that such online courses recognise the changing nature of student cohorts who are portrayed as juggling a number of competing demands—work, study, family commitments, etc. Although online courses can be an appropriate response to the needs of contemporary learners, as they allow anywhere anytime access to course materials and lectures, they are not a panacea for the concerns regarding mathematics education noted above (see Larkin 2016b; Larkin et al. 2016). This research is therefore significant given the increased use of online education in universities.

A major component of my scholarship of education in the past five years has been the continual development of my online pedagogies to continue to engage with PSTs in undergraduate mathematics education courses (Larkin 2016a; Larkin et al. 2012); particularly in relation to the use of digital technologies in mathematics education (Larkin 2016b; Larkin and Jamieson-Proctor 2015). In this chapter, I present and analyse a further refinement to a pedagogical model for mathematics education that I have used since 2013, based on developing both affective and cognitive domains which incorporate the use of embedded video in online lectures for second-year PSTs undertaking a core mathematics education course.

Research Problem

There are a number of different definitions of, and approaches to the use of, online lectures in higher education. In this chapter, I use the online lectures definition of Kay (2012), who classifies online lectures as "files that are distributed in a digital format through the Internet using personal computers or mobile devices" (p. 821). A meta-analysis of research concerning online lectures (Kay 2012) indicates that most researchers generally report that students' feelings or emotions towards their use were predominantly positive. Positive aspects included enjoyment and satisfaction in watching the online lectures, increased levels of motivation, sustained attention, reduced levels of anxiety and increased connectivity with the course lecturer. In the cognitive domain, a large body of the literature exists on the various positive outcomes for student learning when supported by online lectures (see Giannakos et al. 2015).

According to Ronchetti (2010, p. 45), the main advantages of online lectures were their ability to

(a) help working-students by bridging the gap given due to their absence during regular lectures;
(b) support regularly attending students by giving them the opportunity to recover lectures lost due to forced or elective absence;
(c) assist students having difficulties with the lecturer's spoken language; and
(d) give students a means to review critical sections and check their notes.

Research into online lectures by Kay and Kletskin (2012) reported improved learning, perhaps due to some of the affective outcomes reported earlier including: freedom of students to engage at times suitable to them and their learning; improved independence, self-reflection and efficacy; and increased opportunities for revision for exams and assignments. These aspects, when combined with the ability to replay the lecture as needed, suggest that online lectures are a powerful tool for enhancing learning. A further consideration in the research relates to the level of technical quality required for a successful online lecture. For instance, the research of Hibbert (2014) suggests that there is a minimum expected standard for online lectures (in terms of sound and image quality) and that this can, but does not necessarily have to, include green screen effects or animation. Indeed, some students in Hibbert's research noted that they were distracted by "high-end" production elements such as multiple camera angles with one student stating that "I don't think it's the production value as much as it's the content and the professor getting the point across" (Hibbert 2014, p. NP). What seems to be more important than high-end technical innovations is the personal touch, i.e. "a familiar voice and the informal, relaxed tone of their lecturer…which gives an increased feeling of proximity through the podcast" (Popova et al. 2014, p. 336).

As the focus of this chapter concerns the use of video in online lectures, only a snapshot of the literature in concerning online lectures has been provided.

The remainder of the literature review will therefore focus more specifically on the targeted use of video in online lectures and the impact of such use on engagement and learning. A line of research has established that video mimics many of the social cues of face-to-face communication. Kizilcec et al. (2015, p. 730) report that "learners ignore the mediated nature of the lecture experience and perceive the instructor as a social actor, and they respond by mindlessly applying learned social rules". Furthermore, the use of video is thought to lead to increased attentiveness from the learners. Kizilcec et al. (2015) also report that paying attention to online lectures is easier when the lecturer's face is made available and that "the combination of hearing speech and seeing the instructor's face or gesture and speech was found to alleviate learners' cognitive load" (p. 729) with accompanying positive impacts on student learning. Wang et al. (cited in Kizilcec et al. 2014) reported improved learning outcomes as a consequence of responding to the disembodied lecture as though it is a pedagogical agent or social actor. Kizilcec et al. (2014) found that "learners who worked with pedagogical agents with a human voice and that exhibit more natural, human-like gestures, facial expression, and eye gaze performed better on knowledge transfer tests than learners working with a less humanoid agent".

I will report more fully on this phenomenon in my research shortly, enough to indicate here that PST survey responses suggest an increase in their engagement with the online lectures (and thus a likely increase in their learning) as a consequence of the inclusion of video. It appears that the use of video mitigates many of the negative aspects often associated with online lectures (e.g. lack of connection with lecturer) with students in the Kizilcec et al. (2014) study reporting similarities between this style of lecture and actual face-to-face lectures. A common theme running through the research literature, and supported by my research, is that the video makes the lecturer "more present" to the students and that this in turn triggers a response in them where they feel more engaged with the lecturer. I will discuss this notion of "increased presence" in the findings section of this chapter.

It would be remiss of any review of the use of online lectures not to recognise some areas of challenge related to online lectures—these include time management, ability for students to regularly engage with the lecturer and technical issues related to the recording and publishing of lectures (Kay 2012). However, as was the case with arguing for the use of video in online lectures, I will limit the discussion on negative aspects of online lectures to the issue of engagement. Research by Chester et al. (2011) and Kazlauskas and Robinson (2012) has indicated that some university students felt that their learning needs were not adequately supported and thus achieving their learning goals was made more difficult as the level of access to the lecturer in online spaces was less than that available in face-to-face lectures. Although it is not possible to directly establish negative correlations between online lectures and dissatisfaction, the lack of connection to the lecturer was the most prominent concern of the PSTs in the research noted above and was also prominent in the research of Larkin et al. (2016).

Objectives of the Study

The following questions guided the study

1. Did these PSTs prefer video of my face included in the online lectures, and, if so, how much video did they prefer?
2. What was the impact of the use of video on their engagement with the lecturer and with the course?

Research Methodology

The data for this chapter were collected via an anonymous survey of second-year PSTs at three campuses of a metropolitan Australian university and were completed online, and at the end of the course, to avoid bias. The survey asked a number of open ended questions about the use of online lectures in the course including questions regarding how and where the lectures were watched; whether including video was preferable to just PowerPoint slides and audio; how the online lectures affected overall engagements with me and the course; and whether they preferred the online lectures with full video, part video or no video. I had taught these PSTs in their first-year mathematics education course that used online lectures without video, so there was a clear point of distinction between their experiences of differing forms of online lectures. There were 45 student responses. Ethical clearance was granted from the university for the research to take place. PSTs are identified only by code—e.g. PST1 through to PST45.

Results/Discussions

To establish the context of the online lecture viewing patterns of the PSTs, I have provided usage data from the entire PST cohort (n = 273) collected by EchoCenter software (EchoCenter is the proprietary name of the lecture recording system used by the university). A design feature of the software is the ability to capture PST usage data—both at the individual and the cohort level (Singer 2015). Total lecture views can also be categorised by week or by topic and include counts of unique views (i.e. how many different users viewed the lecture) and cumulative views (i.e. the number of total views of the lecture). These are different totals because some PSTs watched the online lectures more than once (Table 1).

A number of observations regarding the data can be made: firstly, PST viewing of the lectures declines over the semester (this mirrored the pattern of reduced attendance at face-to-face workshops); secondly, the cumulative views (total number of views) are much greater than the unique view (count of discrete

Table 1 Unique and cumulative views by lecture

Mathematics two cohort (n = 273)		
	Unique	Cumulative
Lecture		
3	172	270
4	159	238
5	131	155
6	123	162
7	98	139
8	114	128
9	97	125
10	77	103
11	83	103
By week		
3	128	323
8	98	318
14	48	298

usernames) indicating that many PSTs viewed the lecture more than once; thirdly, the week by week view indicates that usage spiked in Week 3—the first week that online lectures were available to them (in the initial two weeks of each semester I use face-to-face lectures); Week 8 (major assignment was due) and in Week 14 (exam preparation) and that the viewing pattern seems to be in pairs or groups (due to the discrepancy between individual views and cumulative views). These data are consistent with data collected over the three years that the course has been offered and the number of views was not significantly affected by the use of video within the online lectures trialled in 2015. I discuss the significance of the overall viewing patterns for PST engagement and learning in Larkin (2016b).

A second important viewing pattern that emerged from the student survey was the choice of device for lecture viewing. Prior to the survey, I anticipated that many PSTs were downloading the lectures to watch on an iPad or similar device. When the lectures are viewed on these devices, the video component is not downloaded. Consequently, I did not record a video in previous iterations as I presumed it would be redundant. Contrary to my intuition, the PSTs in this project overwhelming reported viewing the videos streamed directly to a desktop computer. Only three of the 45 PSTs reported downloading the online lecture to a mobile device. Given these data, in future iterations of the course, I will always provide a video component. Although some PSTs indicated a preference to just listen to the audio whilst working through the lecture slides, these PSTs are not disadvantaged by videoing myself in the lectures as they have the option to turn off the video during viewing. Having established the context of the viewing, I now address, in turn, the two specific research questions underpinning this chapter.

Research Question One: Did these PSTs prefer video of my face included in the online lectures, and, if so, how much video did they prefer?

Data from the 45 survey respondents, as well as end of semester student evaluations from the entire cohorts at the three campuses, overwhelming indicate a preference for the inclusion of video within online lectures and clearly indicate a preference for the use of video throughout the lecture rather than just during the introduction. Student comments supporting this claim clustered around the theme of maintaining concentration and attention. Sample comments mentioned "zoning out" when just the lecture slides and audio were used—"*I prefer having the video there—just the voice makes it easy to zone out*" (PST40) and "*I have noticed that I pay more attention to the video lectures as opposed to my zoning out on the non-video lectures. It's not you, it's me. I just learn better visually*" (PST2). Similar comments related to student responses to the videos—"*I prefer the lectures (with video). I immediately responded to it better, seeing a face somehow helps me concentrate*" (PST15) and "*Video is absolutely better. I can see your expressions and gestures and understand what you're teaching at a deeper level*" (PST3).

When it comes to the length of time videos should be used student preferences are more varied. In both full video and part video formats, the total lecture length was one hour. Early in the semester, I trialled two formats—full video throughout the lectures vs. a short lecture with video and a longer lecture without video. Many PSTs preferred full-length video lectures with sample comments including "*I preferred the full video to be honest. It kept me engaged the whole time*" (PST27) with very similar comments from (PSTs 28, 31, 32, 38 and 42). Another PST indicated "*I prefer the whole video. Having that faux sense of one on one boosts attention*" (PST15) and "*I prefer the full videos as it feels as though I am in a face-to-face lecture. The short introductory videos are good, however I find that I disengage from the rest of the lecture as I only have PowerPoint slides to interpret*" (PST30). Other PSTs, however, were just as adamant that the short introductory video was preferable commenting that "*Complete videos seemed more distracting for me and I preferred to listen to the bulk of the content*" (PST45) and "*I prefer the short video followed up by the longer video as the first use of this video was to use the first part as a way to introduce the theoretical component of that instruction while the second part covered the content*" (PST24). The final comment below indicates a second benefit of limited video—playing them back at 1.5 speed "*Full video was sometimes hard to concentrate on both, short video was nice. I like seeing you but without the video I can speed up the lecture a little which makes it easier for me*" (PST26).

The data overall indicate that PST responses, although mixed, were mainly positive about the use of videos and support the findings of Kizilcec et al. (2015) who also noted a similar range of response in the use of videos (with a strong leaning to positivity). It is important to cater for all PSTs where possible and a strong advantage of EchoCenter is that the PSTs have the option to switch the video off altogether, or just switch it off for some parts of the lecture, and then view the lecture as PowerPoint slides and video, slides and audio, or video with no slides. This is also good modelling for PSTs as an example of catering for the differing ways their future students will learn, a point I consider further in answering Research Question Two.

Research Question Two: What was the impact of the use of video on engagement with the lecturer and with the course?

This section of the chapter looks beyond measures of viewing and discusses the impact of the lectures on student engagement with the lecturer and the course as a result of the use of video of my face. The major impact as identified by the student survey responses related to their sense of connection with me and with the course in general. In many ways, the access to my face in the online lectures promoted a sense of connection as many PSTs indicated that it made the online lectures more like a "traditional" face-to-face lecture or teaching context with a resultant increase in their commitment to the lectures. Example PST comments include "*I prefer watching a lecture and seeing the person speak. It feels like they're more a part of it instead of a screen accompanied by audio*" (PST38) and "*I think when you see someone on video and have eye contact it demands your attention more than a voice over*" (PST37). One student took this point further indicating a very personal response to the video "*Sometimes it looked like you were watching me, so it made me feel bad to look away. It also, now I reflect, probably made me listen a little bit more*" (PST42) whilst other comments indicated that my visual presence personalised the lecture with a resultant increases in their level of commitment "*It makes the lecture less of an instructional video which is easy to lose concentration or be distracted from*" (PST34) and "*I prefer the video as it feel like I am at a real lecture and it feels more personal. Without the video I feel like that I don't really mean anything*" (PST16). These data support the claims made in the literature of the importance of the lecturer "being present" with the PSTs and this is one of the reasons why I re-record the lectures each year. This re-recording is my way of demonstrating, I am present with them as a cohort (using their names in the lecture/including current events) rather than just reusing lectures from previous years which would, by definition, be decontextualised for the current cohort.

It is important to note that I have not made any specific claims regarding learning outcomes as I do not have any hard data (comparative test scores or control and experimental groups) to claim improvements in learning as a result of the use of video; however, the level of engagement with the online component of the course certainly increased. Increased levels of engagement have previously been linked to improved student outcomes, and I think it likely that student learning in this course has been positively affected by the inclusion of video of my face in the online lectures. Indicative student comments include "*I like online lectures as I get to pause go back and reaffirm understandings confusing etc.—as a student with cognitive issues etc. it is so much better*" (PST24) and "*it felt as though we were having a one on one conversation about the direction of learning we were heading*" (PST45) and "*I understand the way you teach better when you use video. I can see your gestures and expressions to pick up on those important tips that I may not have realised as important if there had been no video*" (PST2).

Contributions and Conclusions

As indicated earlier, the trend of most universities is towards an increase in the use of Web 2.0 technologies to deliver courses online. Given this observation, research such as this into the use of videos within online lectures is critical. This small pilot study found that the PSTs overwhelming preferred to see my face during the online lectures and that this deepened their engagement with the course and with me and thus had a likely positive effect on their learning.

As indicated in the Introduction, as a reflexive university academic, it is a core component of my teaching practice to conduct continual research into improving the use of online lectures in mathematics education courses I design and deliver. This chapter has focused on the use of videos with online lectures and continued to support the findings from other research conducted by Larkin et al. (2016) and also by Gorissen et al. (2012) who found that "most students express a preference for courses accompanied by online recordings of the lectures. This is not only the case for traditional distance students, but also for on-campus students as well" (p. 298). It is acknowledged that the creation of online lectures, including those with additional video, is a time-consuming process; however, the time taken is well spent to enhance the engagement of PSTs mathematics in blended and online mathematics education courses.

Acknowledgements The author would like to express appreciation for the support of the School of Education and Professional Studies at Griffith University in providing funding for me to attend the fourth International Conference on Learning and Teaching (TIC 2016) with the theme of "Empowering twenty-first Century Learners Through Holistic and Enterprising Learning". This chapter builds upon a paper presented at the above conference in October 2016.

References

AAMT. (2006). *Standards of excellence in teaching mathematics in Australian schools*. Retrieved from http://www.aamt.edu.au/content/download/499/2265/file/standxtm.pdf

Chester, A., Buntine, A., Hammond, K., & Atkinson, L. (2011). Podcasting in education: Student attitudes. *Behaviour and Self-Efficacy, Educational Technology and Society, 14*(2), 236–247.

Giannakos, M. N., Jaccheri, L., & Krogstie, J. (2015). Exploring the relationship between video lecture usage patterns and students' attitudes. *British Journal of Educational Technology*. doi:10.1111/bjet.12313

Gorissen, P., van Bruggen, J., & Jochems, W. (2012). Students and recorded lectures: Survey on current use and demands for higher education. *Research in Learning Technology, 20*.

Grootenboer, P., & Hemmings, B. (2007). Mathematics performance and the role played by affective and background factors. *Mathematics Education Research Journal, 19*(3), 3–20.

Hibbert, M. (2014). What makes an online instructional video compelling? *EDUCAUSE Review*. Retrieved from http://er.educause.edu/articles/2014/4/what-makes-an-online-instructional-video-compelling

Kay, R. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior, 28,* 820–831.

Kay, R., & Kletskin, I. (2012). Evaluating the use of problem-based video podcasts to teach mathematics in higher education. *Computers & Education, 59,* 619–627.

Kazlauskas, A., & Robinson, K. (2012). Podcasts are not for everyone. *British Journal of Educational Technology, 43*(2), 321–330. doi:10.1111/j.1467-8535.2010.01164.x

Kizilcec, R., Bailenson, J., & Gomez, C. (2015). The instructor's face in video instruction: Evidence from two large-scale field studies. *Journal of Educational Psychology, 107*(3), 724–739. doi:http://dx.doi.org/10.1037/edu0000013

Kizilcec, R., Papadopoulos, K., & Sritanyaratana, L. (2014). *Showing face in video instruction: Effects on information retention, visual attention, and affect*. Paper presented at the CHI 2014, Toronto, Ontario, Canada.

Larkin, K. (2016a). Course redesign to improve pre-service teacher engagement and confidence to teach mathematics: A case study in three parts. *International Journal of Mathematics Teaching and Learning (IJMTL).* Retrieved from http://www.cimt.org.uk/ijmtl/index.php/IJMTL/article/view/7

Larkin, K. (2016b). Rapport in the context of blended learning in mathematics education courses: Challenges and implications? In L. Rowan & P. Grootenboer (Eds.), *Student engagement and educational rapport in higher education contexts*. London: Palgrave Macmillan.

Larkin, K., & Jamieson-Proctor, R. (2015). Using transactional distance theory to redesign an online mathematics education course for pre-service primary teachers. *Mathematics Teacher Education and Development, 17*(1), 44–61.

Larkin, K., Jamieson-Proctor, R., & Finger, G. (2012). TPACK and pre-service teacher mathematics education: Defining a signature pedagogy for mathematics education using ICT and based on the metaphor "mathematics is a language". *Computers in the Schools, 29*(1–2), 207.

Larkin, K., & Jorgensen, R. (2015). 'I hate maths: Why do we need to do maths?' Using iPad video diaries to investigate attitudes and emotions towards mathematics in year 3 and year 6 students. *International Journal of Science and Mathematics Education*, 1–20. doi:10.1007/s10763-015-9621-x

Larkin, K., Rowan, L., Garrick, B., & Beavis, C. (2016). Student perspectives on first year experience initiatives designed for pre-service teachers in their first weeks of university study. *Journal of University Teaching & Learning Practice, 13*(1).

Popova, A., Kirschner, P. A., & Joiner, R. (2014). Effects of primer podcasts on stimulating learning from lectures: How do students engage? *British Journal of Educational Technology, 45*(2), 330–339. doi:10.1111/bjet.12023

Rubinstein, H. (2009). *A national strategy for mathematical sciences in Australia*. Melbourne: University of Melbourne.

Singer, F. (2015). *Education's moment of truth.* Retrieved from https://www.insidehighered.com/views/2015/05/14/professors-should-seize-chance-use-data-improve-learning-essay

Diagnosing Higher Education on Purposefulness: Introducing the Employability Development and Assessment Maturity Model (EDAMM)

P. Vande Wiele, V. Ribiere and J.-L. Ermine

Abstract Employability has been on the political agenda for over two decades. The role of Higher Education (HE) in the development of employability in its learners is undeniably pertinent and with that, the Higher Education Institutions (HEIs)' ability to offer an effective developmental process in this regard shapes the current competitive climate in HE. Be it at various levels of priority, employability has furthermore emerged as a formal indicator of quality assurance in national and international accreditation frameworks for HE. Aside from their evaluative purpose, such frameworks also aspire to nurture and support a spirit of continuous improvement to the benefit of the institution, its learners and the larger society they are part of. Even though there is an abundance of literature around employability and HE which indicates the value of a holistic view and subsequent institutional address, this must be advanced to the development of practical tools that address such a holistic approach. A mechanism that simultaneously allows for diagnosing the effectiveness of the developmental process and serves as a pathway for improvement is up to date lacking. Given the importance of employability as a strategic goal for sustainable HE, the formulation of such mechanism is timely. This paper presents the current state of development of a maturity model on how HEIs can tackle employability, viewing this construct from a holistic lens. The paper will also outline future steps in order to further validate the model towards a highly robust quality assurance tool for HE.

P. Vande Wiele (✉)
Bahrain Polytechnic, Business School, Isa Town, Bahrain
e-mail: philippe.vandewiele@polytechnic.bh

P. Vande Wiele
PhDKIM, Bangkok University, Bangkok, Thailand

V. Ribiere
IKI-SEA, Bangkok University, Bangkok, Thailand

J.-L. Ermine
Telecom Business School Sudparis, Evry, France

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_18

Keywords Employability · Higher education · Maturity model · Quality assurance

Introduction

In the light of the new economic and societal realities of the twenty-first century against the backdrop of the emergence of the knowledge economy and the knowledge society, employability has become a major item on the national and supranational political agenda around the world (Oliver 2011, 2015). Additionally, economic and societal trends of globalization, increased mobility of labour and increased access to education have resulted in changed career perspectives whereby the onus has shifted to the individual in terms of career-management (Sook et al. 2012). The emergence of the knowledge economy in particular has reignited a debate that has been latent since the 1960s around how well HEIs' perform in their contribution to the development of the required human capital for societal and economic progress.

Even though acknowledged as an issue for decades, the gap between the profile of new graduates that enter the world of work and the current labour market requirements remains a topic of discussion and concern (Jackson 2009, 2013; Vande Wiele et al. 2015). The scholarly understanding of the construct of employability has changed over the last few decades whereby extensive studies on the topic have illuminated its highly complex, relative (Clarke 2008) and continuously evolving nature (Gazier 2001). Up to date, however, the construct still suffers from ambiguity around what it is. The authors view the construct of employability from a holistic perspective meaning that a person's employability concerns three influencing factors of intrinsic, extrinsic and actionable nature (Vande Wiele et al. 2014). Such view requires HEIs to give consideration to the elements inherent to the individual (e.g. competencies), elements in one's direct or wider environment (e.g. socio-economic factors) and notions around engagement and experience in employability-related context (e.g. education, work experience, and networking) when designing and an educational value offering that will deliver on its promise of employability development.

Research Problem

Even though the address of HE towards employability has been given ample attention in the literature (Oliver 2015), its notion has more often than not been treated in a compartmentalized manner. The complexity of the employability construct and the HEI as a system are likely two of the reasons why holistically systematizing the interplay between both has only scarcely been attempted (Maher 2011). Up to now, destination data have been the standard measure to evidence

employability as a result of HE (Bridgstock 2009); however, more attention is needed to evidencing the process of employability development to effectively tackle the issue (Mayur and Johnson 2014). In the light of the position employability has taken in the context of national and international quality assurance frameworks and purposeful HE; the development of a mechanism that allows for both evaluation and continuous improvement is highly relevant and timely giving rise to two research questions that frame this paper: RQ1. How can a HEI address employability? and RQ2. How can a HEI be diagnosed on its address of employability with the eye on continuous improvement?

Objectives of the Study

This paper aims to present the current state of a larger ongoing study that tackles the development of a diagnostic tool concerning HE institutional practice for employability: the employability development and assessment maturity model (EDAMM). The development of such model will identify and describe effective employability-conducive HE practices spanning across the totality of institutional activities—addressing RQ1. The descriptions will sketch different sophistication levels of the processes and approaches HEIs can take to address the goal of employability of its learners—addressing RQ2.

Research Methodology

Following a design science methodology, this study has adopted a qualitative approach for theory building through multiple case studies (Eisenhardt and Graebner 2007), principles of design science (Hevner et al. 2004) and principles of maturity modelling (Mettler 2011). The model is constructed using the three cycle approach by Hevner (2007) consisting of a central design cycle supported by a relevance cycle and a rigour cycle as outlined in Fig. 1.

Three purposefully selected case studies were developed through thematic analysis of in-depth interviews with key information, institutional documentation, information in the public domain and personal observation. The selected cases concerned undergraduate business programs spanning across three continents to avoid a one sided perspective on education. The data per case study was coded in two rounds: (1) coding according to five themes identified through extensive literature review (Vande Wiele et al. 2014) and (2) coding at theme level according to emergent subthemes. After this within-case analysis, the findings of each case were subjected to cross-case analysis in search for literal or theoretical replication logic (Yin 2012) in order to develop gradient descriptions of employability-conducive institutional practices to reflect different levels of process sophistication.

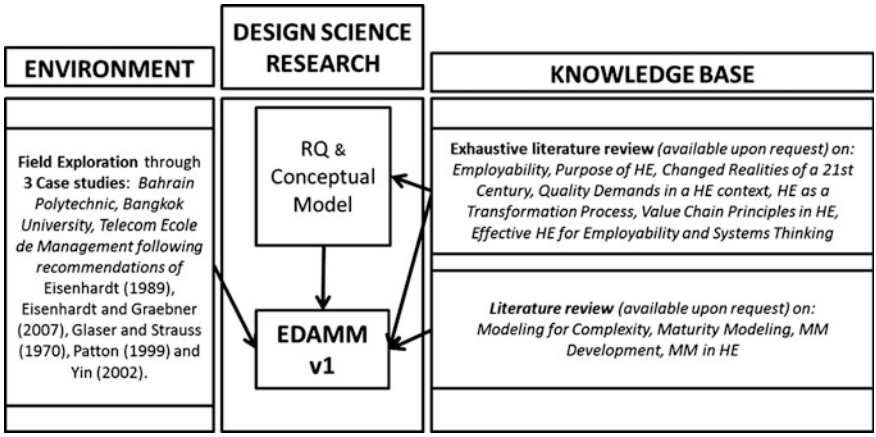


Fig. 1 Design science research approach in context of this study

Results/Discussions

The submission guidelines for this publication do not allow the presentation of the write up of the case studies or the various descriptions of subthemes that lead to the model. Therefore, the results will be presented in a summarized and synthesized manner by means of presenting the current, most up to date version of the EDAMM (Table 1) and a general overview and outline of the model's components and content. The case studies identified five general levels of process sophistication and five themes with a total of twenty-two subthemes amounting to a structure as presented in Fig. 2.

These allow to comprehensively describe an institutional process to address employability, addressing RQ1. Maturity modelling from a potential-performance-perspective, following the perspective of Crosby (1979), allows not only for evaluating a process but also outline potential pathways forward towards improving quality results. Adopting such approach fits well with a suggestion towards answering RQ2.

Curricular activities concern the academic dimension of the transformation process for which the following five criteria were found to make an account of its composition: 'Teaching and Learning', 'Outcomes', 'Faculty', 'Curriculum Development' and Curriculum 'Design and Course Sequence'. Given the fact that curricular activities are considered as core to the HEIs' value chain (Cummings and Shin 2014), it is only obvious that this dimension is recognized as fundamental to the transformation process for employability. It is furthermore clear that an embedding approach is asserted as far more desirable compared to a bolt-on approach. Teaching and Learning must be student centred, authentic, collaborative, reflective and experiential. The holistic nature of employability must be used to craft the curricular outcomes. A faculty of academics and practitioners typically

Table 1 Employability development and assessment model

	Curriculum	Support services	Industry relations	Quality measurement	Leadership
Traditional	A theory dense curriculum that is delivered and developed by pure academics in the field through tutor-centred mechanisms that focuses on theory acquisition. Programme design and development does not consider employability factors beyond theoretical knowledge	Support services are very scarce, understaffed, poorly communicated and typically limited to ad hoc activities around careers. Engagement of internal or external stakeholders is low to non-existent and the services contribute at best only minimally to the development of employability	There is no formal or systematic mechanism around the development of Industry relationship because it is not valued as pertinent towards the building of employability of the graduates. Existing relationships are passive and superficial, providing few insights in the labour market	Quality control around employability is not considered important or beneficial for improvement. It is addressed through a compliance approach using simplistic destination data for reporting purposes	Employability does not have a formally articulated strategic place in the core or supporting activities of the HEI. It is not part of the organizational culture, and employability is not seen as a potential competitive advantage
Espoused	The curriculum is for its majority focused on theoretical knowledge with some application through low-level authentic learning approaches linked to some general abilities in the field of study. The curriculum is generally informed by the external environment and designed, delivered and controlled by academics	Support services consist of a series of activities particularly oriented towards employment upon graduation. The activities are not systematically organized or institutionally orchestrated. Engagement of learners is overall limited and the results of the efforts are not very impactful	Industry relations develop rather organically at departmental level than systematically. The relationships are mainly conversational in nature serving primarily the institutional rhetoric and PR purposes. The connection with industry only limitedly impacts the approach of the HEI to the	Quality considerations around employability are predominantly considered by articulating espoused quality vs requirements of the labour market. Expressed through destination data and justified by very general, practice-oriented and highly sematic measures in terms of the process that is in place	Employability is recognized as a potential competitive advantage but the institution lacks implementation of strategic discourse. Relevant organizational structures and processes exist but are inactive or ineffective. The organizational culture does not capture the concept of employability beyond semantic rhetoric. Good

(continued)

Table 1 (continued)

	Curriculum	Support services	Industry relations	Quality measurement	Leadership
	with minor industry experience		development of its value offering	Employability is included in institutional quality discourse but is only sporadically used as a measure or driver for improvement	practice around employability is suggested but experiences difficulty in terms of uptake or adoption at institutional level
Enacted	The curriculum is student-centred and focused on the application of knowledge. It is realized through learning experiences across a gradient of authenticity by faculty members with considerable industry experience teaching in the later part of the programme. The programmes are informed by field specific labour market requirements resulting in curriculum that is oriented towards the development of field or industry specific competencies	Systematic, formally planned approach to a variety of activities supporting employability by a formally trained department. Involvement of external stakeholders (participation or information exchange) is the norm and resulting in meaningful opportunities for learners to enhance their employability. Engagement of learners is most common among seniors	There is an institutional department for industry relations to support the departmental efforts. The relationship is developed as a partnership of information exchange to inform for a meaningful HE value offering with occasionally highly invasive collaboration	Quality in terms of the process is given attention through the identification of measures for quality control. Employability is actively included in the quality management of the curricular practices alongside with some minor consideration that is given to the monitoring of support activities. Analysis and reporting is happening in various departments in isolation from one another and lacks a systematic approach and institutionalized mechanism to make it	Employability is a formal part of the strategic plan to strengthen the institution's competitiveness and its fit for purpose. The organizational culture reflects commitment and enthusiasm around employability development in pockets of curricular activities, but lacks organization wide buy in. The organization shows commitment towards employability as a formal priority through endorsing an institutional approach to employability based on

(continued)

Table 1 (continued)

	Curriculum	Support services	Industry relations	Quality measurement	Leadership
				feed into a larger plan for improvement	best practice, designated structures and relevant associations with external entities
Integrated	With employability as its central tenet, a wide variety of internal and external stakeholders are involved into the design, development and delivery of the curriculum that aspires to instil general, field specific and career competencies in its learners. The faculty involved in the development and delivery of the programme has strong currency with industry practice	Support activities are governed by qualified experts in career services and treated as an integral part of the institutional transformation process for employability. Services are developed and delivered through high involvement of relevant internal and external stakeholders. Engagement of learners is high and the results around career management skills uptake, opportunities for experience and graduate employment are significant	The institution addresses industry relations through a basic relationship management system resulting in synergistic relationships with clear goals and deliverables. Industry is highly involved in strategic and operational sides of curricular and support activities	Quality around employability development is managed throughout the transformation process in a holistic manner. Detailed data from a comprehensive set of stakeholders is collected and analysed in an institutionalized systematic way towards monitoring both process and outputs of all relevant activities. Reporting results in action plans for quality improvement that fit in an institutional quality improvement plan	Employability is viewed through a holistic lens and considered a strategic priority. It is institutionally contextualized through the development of action plans for each relevant department whereby decision-making is highly driven by cascading employability objectives. Employability is truly part of the organizational culture and a central tenet in many activities involving internal and external stakeholders. Good practice in context of the construct is considered the norm and best practice is

(continued)

Table 1 (continued)

	Curriculum	Support services	Industry relations	Quality measurement	Leadership
					institutionally celebrated
Optimized	The curriculum evidences best practice and effectiveness in terms of design, development and delivery for employability towards a highly effective approach of developing lifelong learners. The learning environment is transformational and consistently produces well balanced individuals with a holistic set of competencies relevant for the economic and societal realities of today and the future. The curriculum is continuously realigned with industry and delivered by a hybrid faculty of cutting edge practitioners/educators with a good sense of career guidance	Support activities are highly aligned and responsive to the economic and societal realities and form part of the knowledge body of the organization around developing employability in the learners. The staff is highly current with recruitment and talent management practices in industry. Engagement of learners is very high and includes co-creation of service value. The results are highly significant in terms of developing very impactful career management skills and facilitating the securing of highly meaningful employment opportunities	The institution uses a sophisticated knowledge exchange system to manage its industry relations in order to advance a sustained mutually beneficial relationship. Industry becomes the demanding party for collaboration and partnerships, resulting in a leveraged network towards securing support, the creation of opportunity and a highly competitive profile in the HE landscape	The institution continuously monitors the transformation process for its development of employability against a highly up to date objective of industry and societal measures inclusive of professional accreditation in both industry and educational context. Using highly detailed and comprehensive data, it continuously fine-tunes its process and is highly responsive and agile towards economic and societal dynamism. The institution is considered as a high-level benchmark in terms of HE and employability	Every organizational activity gravitates towards employability development which is considered as the primary purpose of the HEI. The organization has staffed its core and primary supporting activities around employability development with people who are well experienced in realizing employability through HE resulting in employability being woven into the organizational fabric. The institution drives the cutting edge around employability development through incremental and radical innovation

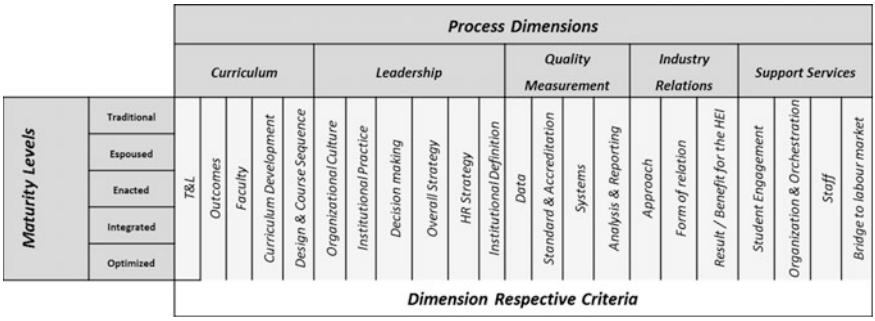


Fig. 2 EDAMM v1 structure

better reflects the realities of the twenty-first century, whereby through adjunct faculty the institution is more agile to attune to current industry practice and additionally gives learners opportunity to network in a professional environment. Curriculum Design and Development must use a scaffolding approach towards competency development towards the development of a 'whole' professional. Through consultation with a wide array of stakeholders (internal and external), the institution can further strengthen its currency with socio-economic trends.

The 'Leadership' theme captures the management-related practices concerning the totality of the institution which breaks down into 'Organizational Culture', 'Institutional Practice', 'Decision-Making', 'Overall Strategy', 'HR Strategy' and 'Institutional Definition'. The Leadership theme confirms the place management practice has been attributed in the value chain according to the literature (Pathak and Pathak 2010; Cummings and Shin 2014). This paper approached leadership as the manner in which an organization as a whole navigates the quest for and effective employability transformation process. With institutional commitment as a key factor, the daily practice of the organization must reflect the inclusion of employability throughout the organizational modus operando whereby it is embraced by all participants. Institutional practice is as much about doing things right as it is about building knowledge capacity for future success with employability as a driving factor to decision-making, strategic direction and competitive positioning. The availability of relevant organizational expertise is equally fundamental warranting carefully crafted HR practices around recruitment, performance appraisal and professional development. Finally, particularly in the situation where a HEI is embarking on a path of change in terms of addressing employability, attention must be given to the manner in which the institution defines employability, since it directly affects common understanding and consequential actions.

'Quality Measurement' concerns the thematic activities around quality assurance and improvement in an employability context. Since employability is often referred to as one of the most important quality measures for the HE graduate-product (Reichelt and Schreier 2010; Eurydice 2014), its emergence in the model is not

surprising. This component was found to consist of four underlying elements, i.e. 'Data', 'Standard and Accreditation', 'Systems' and 'Analysis and Reporting'. In order to meaningfully appreciate the quality of HE transformation process to employability, various sorts of data are required, i.e. context, process, outcome. The EDAMM arguably adequately addresses the concern raised by Maher (2011) around the lack of consideration for an institutional approach and Bridgstock's (2009) observation of the sole attention to destination data. A quality control mechanisms should consists of a systematic collection process involving internal and external stakeholders guided by key metrics that place employability transformation central to the conception of quality. Analysis and reporting needs to happen at the right level in order to result in actionable information and knowledge that effectively flows through the organization. Standards should be informed by credible and meaningful accreditation and quality assurance bodies relevant to the discipline in question.

As much as the potential value of industry to the employability transformation process is intuitively apparent from the above discussion, all three case studies reiterate its pivotal role, hence the theme 'Industry Relations'. Three criteria have been identified in order to break this component of the transformation process down, i.e. 'Approach', 'Form of the Relation' and 'Benefit/Result for the HEI'. The Approach must be systematic with effective initiation and development mechanisms towards meaningful and sustainable relationships with industry. Considering the 'Form of the Relationship' each of the case studies championed the idea of industry as partners in the pursuit of win-win and ultimately synergistic situations. Benefits for the HEI can range from straightforward input through collaboration in and on the process all the way to recruitment of graduates.

Support services refer to the transformational activities that are directly career oriented yet not necessarily traditionally curricular in nature. To explicate the finer detail of this component of the transformation process, the study has identified 'Student Engagement', 'Organization and Orchestration', 'Staff' and 'Bridge to Labour Market'. Learners' engagement with the support services, through its repeatedly reported challenging nature, was concluded as instrumental to this dimension. Careful orchestration of support activities with the rest of the transformational process and well-organized activities support the realization of a meaningful value proposition to the learners. Professional development of staff in order to create the needed knowledge bases to effectively realize support is highly instrumental to the success of this dimension. Finally, effective support services go back to its capacity to increase the learners' exposure to the workplace and their field in both learning and career-related contexts on the one hand, but equally to assuming a pivotal role in enabling an employability-related knowledge flow in the organization.

Even though the objectives of this paper can be argued to have been met, the content and applicability of the model, however, require further validation in order to be confident in answering both research questions rigorously, particularly RQ2.

This will be addressed in the conclusion section by outlining future next phases in this research endeavour. To comply with the paper guidelines, the authors have opted to limit the description to the theme level[1] across the five maturity levels following typical maturity model development practice (Mettler 2011).

Contributions of the Study

A first contribution of this study is the strengthening of the methodological approach of design science to produce knowledge artefacts and in particular maturity models. This pragmatist methodology is rather novel compared to the longer standing traditional methodological lenses applied in the research field of theory development and modelling for complexity. A second contribution is the development of a model that considers and outlines the complexity of the HE process and its address of employability by means of identifying and qualifying critically relevant activities to employability development and assessment at an institution wide level. This contributes to the body of knowledge around effective HE practices for employability by investigating a variety of operational subdomains of HE such as curriculum, support activities, quality control, leadership and industry relations. A third contribution concerns the introduction of maturity modelling in the context of employability and purposeful HE. Maturity modelling has been widely used for diagnosis, process quality control and improvement in a variety of fields, inclusive of HE (Vande Wiele et al. 2014), but is a novel approach in the context of quality assurance for employability, addressing a dire need in today's HE landscape.

Conclusions

This paper has concisely reported on the first phase of an in-depth approach to developing a mechanism to diagnose the address of HEIs to employability and simultaneously inform for improvement. This phase concerns the combination of exhaustive literature review and three case studies towards the design of a first version of the EDAMM. The second phase of the study has as its objective the validation of the model through expert consultation and scrutiny by means of a Delphi technique to result in the proposal of a valid diagnostic model for quality assurance in the context of purposeful HE for the twenty-first century.

[1]For in-depth description of the subthemes, contact the corresponding author.

References

Bridgstock, R. (2009). The graduate attributes we've overlooked: Enhancing graduate employability through career management skills. *Higher Education Research and Development, 28*(1), 31–44.

Clarke, M. (2008). Understanding and managing employability in changing career contexts. *Journal of European Training Industrial Training, 32*(4), 258–284.

Crosby, P. B. (1979). *Quality is free: The art of making quality certain*. New York: McGraw-Hill.

Cummings, W. K., & Shin, J. C. (2014) Teaching and research in contemporary higher education: An overview. In *Teaching and research in contemporary higher education* (pp. 1–12). Springer: Netherlands.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of Management Journal, 50*(1), 25–32.

Eurydice. (2014). *Modernisation of higher education in Europe: Access, retention and employability 2014, eurydice report*. Education and Training, European Commission.

Gazier, B. (2001) Employability: The complexity of a policy notion. In P. Weinert, M. Baukens, & P. Bollerotet (Eds.), *Employability: From theory to practice* (pp. 3–23). NJ: Transaction Books New Brunswick.

Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly, 28*(1), 75–105.

Hevner, A. R. (2007). A three cycle view of design science research. *Scandinavian Journal of Information Systems, 19*(2), 87–92.

Jackson, D. (2013). Business graduate employability—Where are we going wrong? *Higher Education Research & Development, 32*(5), 776–790.

Jackson, D. (2009). An international profile of industry-relevant competencies and skill gaps in modern graduates. *International Journal of Management Education, 8*(3), 29–58.

Maher, A. (2011). Employability statements: A review for HEFCE by the higher education academy of the submissions to the Unistats website. *Journal of Hospitality, Leisure, Sports and Tourism Education, 10*(2), 132–133.

Mayur, S. D., & Johnson, R. A. (2014). Integrated systems oriented student-centric learning environment: A framework for curriculum development. *Campus-Wide Information Systems, 31*(1), 24–45.

Mettler, T. (2011). Maturity assessment models: A design science research approach. *International Journal of Society Systems Science, 3*(1/2), 81–98.

Oliver, B. (2011). *Assuring graduates outcomes*. Australia: Australian Learning and Teaching Council.

Oliver, B. (2015). Redefining graduate employability and work-integrated learning: Proposals for effective higher education in disrupted economies. *Journal of Teaching and Learning for Graduate Employability, 6*(1), 56–65.

Pathak, V., & Pathak, K. (2010). Reconfiguring the higher education value chain. *Management in Education, 24*(4), 166–171.

Reichelt, B., & Schreier, B. (2010). Labour markets' internationalisation and the new challenges for academic education. *Public Administration, 1/2* (25/26), 58–64.

Sook, S. A., Nohria, N. N., & Khurana, R. (2012). *The handbook for teaching leadership: Knowing, doing, and being*. LA: Sage.

Vande Wiele, P., Khalid, F., Ribiere, V., & Ermine, J. L. (2015). *Employability, a topic for knowledge exchange to strategically positioning higher education institutions*. Paper Presented and Published in Proceedings, ICICKM2015, 5–6 November, Bangkok, Thailand.

Vande Wiele, P., Ribiere, V., & Ermine, J. L. (2014). A diagnosis framework for preparing future workforce in higher education. In *Proceedings IKMAP, 2014,* (pp. 198–213).

Yin, R. K. (2012). *Case study research: Design and methods* (5th ed.). Sage Publication.

Examination of the Cross-Disciplinary Connection and Cross-Disciplinary Integration of ESL and Music Pedagogies

Ran Whitley

Abstract The purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross-disciplinary connection and cross-disciplinary integration. The scope of the study focused on one selected pedagogical problem from each discipline: (1) supra-segmental pronunciation from ESL and (2) rhythmic literacy from music. The study examined trends in ESL pedagogy utilizing musical rhythm to teach supra-segmental pronunciation, trends in music pedagogy utilizing language to teach rhythmic literacy, and trends to integrate the two disciplines. The study established that there is a cross-disciplinary connection in a compartmentalized context and provided a foundation for subsequent research in cross-disciplinary integration.

Keywords ESL · ELL · Music · Rhythm · Orff · Supra-segmental

Introduction

The similarities between language and music are remarkable. The practice of language and music is both universal human behaviors present throughout history and culture. Both are processes in time with rhythmic and expressive devices such as tempo, intensity, intonation, and formal structure. Noting these similarities, the purpose of this study was to examine the pedagogies of English as a second language (ESL) and music for cross-disciplinary connection and cross-disciplinary integration. 'Cross-disciplinary connection' is defined as two distinct disciplines utilizing similar pedagogies, and 'cross-disciplinary integration' is defined as two disciplines that are authentically merged in the curriculum sharing instructional time with objectives and learning outcomes for each discipline.

R. Whitley (✉)
College of Arts and Sciences, Campbell University, Buies Creek, USA
e-mail: whitley@campbell.edu

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_19

Research Problem

The scope of this study focused on one selected problem from ESL pedagogy, and one selected problem from music pedagogy. The problem from ESL pedagogy focused on the mastery of supra-segmental pronunciation. According to Crystal (1980), and Avery and Ehrlich (1992), traditional ESL pedagogy has emphasized segmental pronunciation at the neglect of the supra-segmental pronunciation. The term 'segmental' pronunciation is defined as the pronunciation of individual words. 'Supra-segmental' pronunciation is defined as the pronunciation of words sequenced together in phrases or sentences. Avery and Ehrlich (1992) asserted that fluent and intelligible speech is possible only when students achieve the 'rhythm' of English through mastery of supra-segmental pronunciation. The problem many English language learners (ELL) experience with English supra-segmentals is that English is a stress-timed language whereas most Asian languages such as Chinese and romance languages such as Spanish are syllable-timed languages. The definition of a 'syllable-timed' language is when each syllable receives the same approximate amount of time across the sentence regardless of the relative stress of the syllable (Example One). In 'stress-timed' languages like English, stressed syllables form regular beat patterns across the sentence, while unstressed syllables fall between the beats (Example Two). Typically, main content words such as nouns and verbs form beats, while function words such as articles and auxiliaries fall between the beats. Learners whose primary language is syllable-stressed have a tendency to impose their native pattern of pronunciation onto English resulting in unintelligible patterns of pronunciation.

The selected problem from music pedagogy focused on rhythmic literacy. 'Rhythmic literacy' is defined as ability to read and perform notated musical rhythm accurately with appropriate musical stress. Noted music pedagogues such as Gamba (2016) and Strouse (2007) identified rhythmic literacy as the foremost challenge toward achieving thorough musical expression. The problem of rhythmic literacy was chosen because of its pedagogical similarity to the correct stress-timed pronunciation of English. Cole (2008) grouped rhythmic literacy methods into three broad categories: (1) numeric counting, (2) non-sensible syllables, and (3) sensible syllables (Examples Three, Four, and Five, respectively). This study only considered the sensible syllable rhythmic literacy method because of its close approximation to supra-segmental pronunciation in English.

Objectives of the Study

The objectives of the study were to examine the literature of ESL and music for cross-disciplinary connection and practice of cross-disciplinary integration and to formulate conclusions and recommendations for research.

Research Methodology

The following research questions were formulated to guide the examination of literature of ESL and music pedagogies for cross-disciplinary connections and integrative practice.

Research Question One: What current trends in ESL pedagogy incorporate musical rhythm to enhance supra-segmental pronunciation?
Research Question Two: What current trends in music pedagogy incorporate language to enhance rhythmic literacy?
Research Question Three: What trends exist that specifically teach supra-segmental pronunciation and rhythmic literacy in an integrative context?

A literature search was made through the Education Resources Information Center (ERIC) and the Institute of Education Sciences (IES), an exhaustive repository of research studies and journal articles provided by the US Department of Education. Key search words including 'ESL, English as a second language, ELL, speech, music, rhythm, supra-segmental, and Orff' were used in various combinations to access relevant and pertinent studies and reports in the area of ESL and music education. Search results were organized and discussed around each research question.

Results/Discussion of Research Question One

The examination of literature in ESL pedagogy demonstrated notable trends toward using rhythmic concepts to teach ESL. Chen et al. (1999) observed successful outcomes by using the prosodic structure of simple songs and nursery rhymes to teach English to Chinese students. Their use of prosodic structure exactly equated to musical meter that generalized to spoken English (Example Six). Chela-Flores (2001) proposed an adaptive Kodály rhythmic approach for teaching supra-segmental pronunciation using the syllables *TA* and *ti*. The Kodály syllables formed templates for guiding pronunciation (Example Seven). Gilbert (2010) observed that correct supra-segmental pronunciation is not only rhythmic, but melodic as well. Her system of supra-segmental pedagogy used visuals that approximate both rhythm and melodic inflection (Example Eight).

Recent empirical research validated the trend of ESL professionals seeking to incorporate musical rhythmic concepts. Taub et al. (2007) studied the effect of reading English against a rhythmic beat. The effect of supra-segmental performance accompanied by rhythmic beat compared with unaccompanied reading was significant [F (1, 76) = 107.37, $p < 0.0001$]. Trofimovich and Baker (2006) studied the effect of practice with prosodic stress on supra-segmental pronunciation among Korean ELLs. The effect of prosodic practice on the outcomes of pronunciation was significant [F (1, 36) = 62.08, $p < 0.0001$]. Jackson and O'Brien (2011) studied the

effect of prosodic stress timing on intended meaning with stress-timed language among L2 students. The effect of pause (rhythmic rest) on intended meaning was significant [t (11) = 2.65. p = 0.023]. These selected studies were highly representative and congruous of the larger body of the literature in ESL pedagogy indicating a substantial reliance on musical rhythm.

Results/Discussion of Research Question Two

The examination of music pedagogy demonstrated notable trends toward using language to teach rhythmic literacy. Suzuki (2007) prominently relied on language to guide rhythm with young children while use of speech is collectively accepted among Suzuki teachers (Example Nine). According to Gilpatrick (2009), essential Orff pedagogy focuses upon harnessing innate behaviors of children and molding these behaviors into specific musical behaviors such as singing, playing instruments, and improvising. Orff observed that there was an integral connection between musical rhythm and language, and that children naturally merge rhythm and language via nursery rhymes, spontaneous playground chants, and patty-cake games. The essence of Orff rhythmic training is to build on the prosodic nature of nursery rhymes and poetry to form a template for musical rhythm (Example Ten).

Empirical research validated the trend of music educators seeking to incorporate language concepts to enhance rhythmic literacy. Bebeau (1982) studied the effect of language on rhythm performance with children. The effect of Orff rhythm training on performance of rhythm was significantly superior over numeric counting [t (56) = 2.03, $p < 0.05$]. Colley (1987) studied the use of language on rhythm performance with children, and determined the effect of Orff rhythm training on performance of rhythm was significantly superior over all other methods [F (3, 156) = 44, $p < 0.0001$]. The Colley study appeared to be definitive establishing the efficacy of language on rhythm performance. These selected studies were highly representative and congruous of the larger body of music pedagogy literature indicating substantial reliance upon language to teach rhythmic literacy.

Results/Discussion of Research Question Three

An exhaustive search of the ERIC data base using the prescribed search words discovered no cross-disciplinary studies that overtly or intentionally sought to teach supra-segmental pronunciation and rhythmic literacy in a cross-disciplinary integrative context. This result was unexpected considering the similarities of the pedagogies.

Contributions of the Study

The results of this study have established a definite cross-disciplinary connection between the pedagogy of ESL and music. Clearly, ESL professionals use rhythm to teach language, and music educators use language to teach rhythm. The cross-disciplinary integration of ESL and music, however, has not been investigated. Presumably, ESL professionals only test the efficacy of rhythm in relation to language outcomes. Conversely, music educators only test the efficacy of language in relation to musical rhythmic outcomes. Hence, research within each discipline is compartmentalized. Compartmentalization may exist for several reasons. First, professionals in either discipline may not have interest in cross-disciplinary outcomes. Further, professionals in either discipline may not possess enough expertise in the other discipline to conduct research in a cross-disciplinary integrative context.

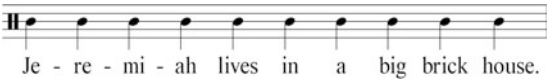
Conclusions

Since the results demonstrated an unequivocal cross-disciplinary connection between ESL and music, and absence of cross-disciplinary integration, further investigation is warranted. This study will be followed by an ensuing study investigating the efficacy of cross-disciplinary integration. General research design will feature as follows:

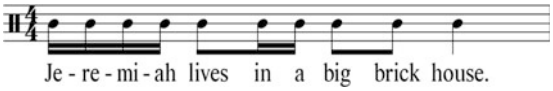
1. Randomizing ESL students into two L1 groups of equal age/grade level.
2. Measuring supra-segmental and rhythmic literacy skills of students with pretest.
3. Instructing Group 1 in both supra-segmental pronunciation and musical rhythm apart from one another in traditional compartmental isolation.
4. Instructing the Group 2 in an authentically merged curriculum sharing instructional time using Orff pedagogy with objectives and learning outcomes for both segmental pronunciation and musical rhythm.
5. Measuring gains of supra-segmental and rhythmic skills with posttest.
6. Analyzing posttest gains for levels of significance between groups.
7. Discussing and disseminating results.

Display of Examples

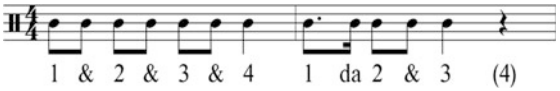
Example One: Syllable-timed Rhythm



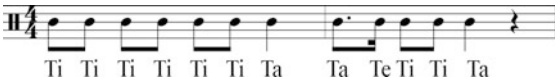
Example Two: Stress-timed Rhythm



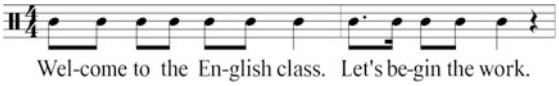
Example Three: Numeric Counting



Example Four: Non-sensible Syllables



Example Five: Sensible Syllables/Orff



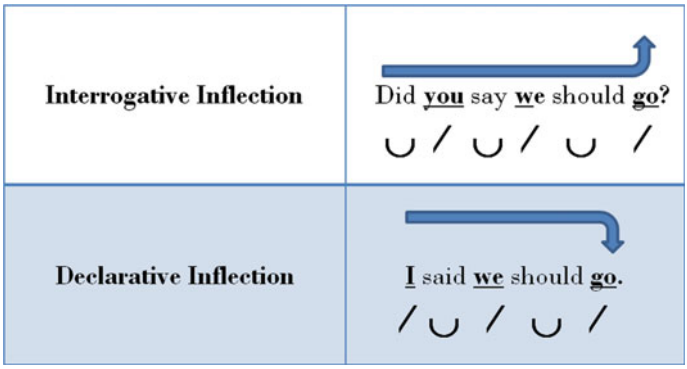
Example Six: 'Twinkle, Twinkle Little Star'

Nursery Rhyme	TWINK-HOW	-le, i	TWINK-WON-	-le, -der	LIT-WHAT	-tle you	STAR, ARE.
Meter	/	∪	/	∪	/	∪	/
Speech	When	Does	Ja-	cob	go	to	school?
Speech	Tell	me	how	to	get	to	town?

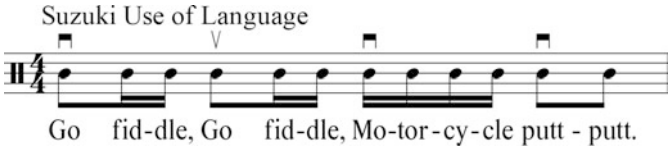
Example Seven: Patterns of Kodály Syllables

Kodály Pattern	TA-ti-TA	ti-TA-ti-TA-ti-TA	TA-ti-ti-TA
Meter	/∪/	∪/∪ /∪/	/∪∪/
Speech	What's your name?	I want to go to town.	When is the time?
Speech	Maggie Sloan	I never get to go.	Hurry downstairs.

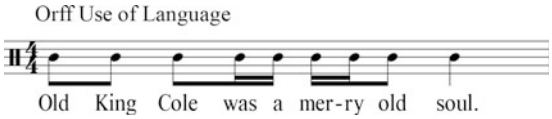
Example Eight: Rhythmic/Melodic Visuals



Example Nine: Suzuki Rhythmic Illustration



Example Ten: Orff Rhythmic Illustration



References

Avery, P., & Ehrlich, S. (1992). *Teaching American English pronunciation*. Oxford, England: Oxford University Press.

Bebeau, M. (1982). Effects of traditional and simplified methods of rhythm reading instruction. *Journal of Research in Music Education, 30*(2), 107–119.

Chela-Flores, B. (2001). Pronunciation and language learning: An integrative approach. *International Review of Applied Linguistics in Language Teaching, 39*(2), 85–101.

Chen, C., Fan, C., & Lin, H. (1999). *A new perspective on teaching English pronunciation: Rhythm*. Retrieved from http://files.eric.ed.gov/fulltext/ED397638.pdf. Last accessed June 1, 2016.

Cole, J. (2008). A brief comparison of rhythm pedagogy systems. *The Orff Echo, 40*(2), 25–28.

Colley, B. (1987). A comparison of syllabic methods for improving rhythm literacy. *Journal of Research in Music Education, 35*(4), 221–235.

Crystal, D. (1980). *A first dictionary of linguistics and phonetics*. London: André Deutsch.
Gamba, S. (2016). *Rhythmic projections: Rhythm exercise for building mastery*. Boca Raton, FL: Ludwig-Masters Publications.
Gilbert, J. B. (2010). *Clear speech: Pronunciation and listening comprehension in North American English* (3rd ed.). New York, NY: Cambridge University Press.
Gilpatrick, L. (2009). Orff Schulwerk: Process, not method. *The Orff Echo, 41*(4), 24–26.
Jackson, C., & O'Brien, M. (2011). The interaction between prosody and meaning in second language speech production. *Teaching German, 44*(1), 1–11.
Strouse, L. (2007). Improving rhythm reading in middle school band. *Teaching Music, 14*(5), 34–39.
Suzuki, S. (2007). *Suzuki Violin School* (Violin Part, Vol. 1, Revised Edition). Miami, FL: Summy-Birchard Music.
Taub, G., McGraw, K., & Keith, T. (2007). Improvements in interval time tracking and effects on reading achievement. *Psychology in Schools, 44*(8), 849–863.
Trofimovich, P., & Baker, W. (2006). Learning prosody and fluency characteristics of second language speck: The effect of experience on child learners' acquisition of five supra-segmentals. *Applied Psycholinguistics, 28,* 251–276.

Quality Control in Physical Education in Malaysia: Relooking at the National Strategy for Quality Physical Education

Eng Hoe Wee

Abstract The purpose of this paper was to examine the QCPE and specifically the national strategy for QCPE. The examinations of QCPE were in terms of continuous efforts in improving PE syllabus and pedagogy, teacher education supply and development, facilities, equipment and resources, monitoring and quality assurance, and community partnerships. The data collection methods were based on content analysis of the primary and secondary sources; government documents, physical education reports, UNESCO report, and research and journal papers were examined in providing relevant supporting evidence. The findings revealed that majority of PE classes were handled by non-PE majors, which has led to poor students' perceptions and attitude towards PE. The PE administrative issues were related to the lack of monitoring of PE teachers by administrators, PE classes were used for other more important subjects, and majority of administrators did not organize staff training programme. For structure-related problems, it was reported PE facilities and equipment were inadequate in most schools. To overcome the challenges mentioned, numerous national strategies have been put in place. The Malaysian Ministry of Education continuously improved PE syllabus and pedagogy through reviews. In addition, the Education National Key Results Areas (NKRAs) under the Government Transformation Programme (GTP) have been established to improve students' performance in schools in addition to providing them with access to better quality education. This was implemented under the concept of high performing schools. Other national strategy involved governmental initiatives through 'sport-for-all' strategies within the Strategic Plan (2010–2015) of the Ministry of Youth and Sport Malaysia, the '1Student, 1Sport' policy of the MOE, and initiatives by the MOE's Teacher Training Division towards training more qualified PE teachers. Collaborative efforts by the private sectors in providing training for sport and recreation through private facilities have provided assistance to the teaching and learning in PE.

E.H. Wee (✉)
Faculty of Applied Sciences and Computing,
Tunku Abdul Rahman University College, Kuala Lumpur, Malaysia
e-mail: weeeh@acd.tarc.edu.my

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_20

Keywords Physical education · Quality assurance · Curriculum · Community partnership

Introduction

Physical education (PE) is an education programme that focuses on student movement experiences to contribute to the growth and development (Pangrazi and Brusseau 2014). PE programmes are a meaningful contributor to the development of healthy, active children and provide the safe, supervised, structured environment children need to learn and practice physically active behaviours (SHAPE 2016). Effective PE programmes increase students' physical activity and impart the knowledge and skills they need to cultivate physically active lifestyles (IOM 2013). According to Pangrazi and Brusseau (2014), PE has two major outcomes, that is physical activity and health, and lifetime behaviours that impact the lifestyles of individuals. In order to reap the benefits from the PE programme, the US Surgeon General urges all school systems to mandate daily PE that totals at least 150 min per week for elementary schoolchildren (USDHHS 2010). The US Surgeon General attributes the rise in childhood obesity, in part, to school cutbacks in PE (USDHHS 2010). Similarly, a large number of studies have reported the correlation of PE with student weight (Pate et al. 2011). Other research evidence indicates that regular physical activity promotes children and adolescents' growth and development while conferring benefits to their physical, mental, and cognitive health (IOM 2013; USDHHS 2008). Thus, we must focus on Quality Physical Education.

QPE is the planned, progressive, inclusive learning experience that forms part of the curriculum in early years, primary and secondary education (UNESCO 2015). QPE acts as the foundation for a lifelong engagement in physical activity and sport through PE lessons which provide children and youth psychomotor skills, cognitive understanding, and social and emotional skills they need to lead a physically active life (afPE 2008). World-wide PE Survey (UNESCO Final report 2013) provided evidence-based data which stated that 'Quality assured inclusive PE Curricula' include qualified teachers, support personnel, timetable allocation, finance, national/regional governmental PE strategies, community partnerships, facilities, equipment, and teaching resources.

In Malaysia, PE is a compulsory subject for primary and secondary schools. It is considered important by the Ministry of Education (MOE) in promoting the modern concept of education that is the development of the 'whole child' (Wee 2013a). The Malaysian school curriculum is committed to developing the child holistically along intellectual, spiritual, emotional, and physical dimensions, as reflected in the National Education Philosophy (MOE 2012). However, as a non-examination subject, PE has received numerous negative reports such as unqualified teaching staff (Chong and Norlena 2010; Kamil et al. 2012; Wee 2013a), lack of facilities

and equipment (Chong and Norlena 2010; Haslinda 2010; Kamil et al. 2012; Syed Kamaruzaman et al. 2014), lack of staff development programme (Chong and Norlena 2010; Wee 2013a), and students have negative attitude towards PE (e.g. lack of enthusiasm towards PE; uninterested in PE; not trying their best in PE class; uninteresting PE lessons) (Chong and Norlena 2010; Haslinda 2010).

Since UN International Year of Sport and Physical Education (PE) was proclaimed in 2005, PE has been increasingly recognized as a broad-based value subject by governments and development actors globally (UNESCO 2015). However, despite those positive developments, PE policy implementation still remains inconsistent (UNESCO 2015).

In Malaysia, Wee (2013a) revealed that there were many challenges in the implementation of PE in Malaysian schools, including the replacement of physical education classes with teaching of other examination subjects, lacking of facilities and equipment, and qualified physical education teachers. The effects of the lack of PE in schools were echoed in some recent research in Malaysia. Wong et al. (2016) reported that approximately 12% of children (10% boys, 14% girls) either did not have or were not active during physical education classes. Other Malaysian researchers reported that Malaysian children recorded low physical activity level and high sedentary behaviour, spending an average of 6.7 h daily in sedentary activities. Moreover, only 15% of children achieved the recommended pedometer count of 13,000 steps per day for boys and 11,000 steps for girls, signifying that a high proportion of schoolchildren were physically inactive (Lee et al. 2015). Low physical activity levels have been reported in both healthy weight and obese Malaysian children (Wafa et al. 2014).

In view of inadequacy in the provision of quality PE and the need of quality PE, it is imperative to examine Quality Control in Physical Education (QCPE) in Malaysia.

Research Problem

The purpose of this paper was to examine the QCPE and specifically the national strategy for QCPE. Even though PE is the most effective means of providing all children and youth with the skills, attitudes, values, knowledge, and understanding for lifelong participating in society (The Declaration of Berlin 2013: UNESCO 2015), its implantation in Malaysia left much to be desired.

As a non-examination subject, PE was given little regard in the scheme of things in an examination-oriented school culture. Often, its periods are used to teach subjects which are of more academic value such as mathematics and science (Chong and Norlena 2010). In a study of 116 Malaysian secondary schools, Kamil et al. (2012) found the implementation was at a very low level. Of 416 PE teachers surveyed, Kamil et al. (2012) revealed that almost 72% of them were not qualified to teach PE, sport facilities and equipment were lowly adequate, time allocated for PE was inadequate, and teaching and learning of PE were lowly adequate (e.g.

teachers not able to deliver instruction well, daily lesson plan was inadequately planned, teacher did not provide adequate feedback, and teachers did not provide conducive learning environment).

In terms of PE programme implementation, Kamil et al. (2012) used checklist from Ministry of Education Malaysia (2009) to compute the total score based on sport facilities and equipment; implementation of PE class; management, maintenance, and safety guidelines for sport fields and sport store room; school leadership; adequacy of teaching and learning PE; students learning opportunities; time allocated for PE; and financial support. The results showed that 28.9% of the schools had high level of PE implementation (total score 198 and above), 36.8% had moderate level of PE programme implementation score (total score of 181–197), and 34.2% had a low implementation score (180 and below). Similarly, Syed Kamaruzaman et al. (2014) surveyed 310 PE teachers using 5-point Likert scale and reported insufficient PE equipments (mean = 4.44), unreplaced broken equipments (mean = 4.45), inadequate facilities (mean = 4.2), and improper use of PE budget (mean = 4.31).

The above-mentioned reports raised issues in terms of quality control in PE programme. Thus, there is a need to examine the Quality Control in PE and national strategy for QPE.

Objectives of the Study

The purpose of this paper was to examine the QCPE and specifically the national strategy for QCPE in terms of teacher education supply and development; facilities, equipment, and resources; curriculum flexibility, monitoring, and quality assurance; and community partnerships.

Research Methodology

This paper is a descriptive and explanatory in nature. The data collection methods are based on primary and secondary sources. The primary sources included thesis and journals. The secondary sources included government documents, physical education reports, UNESCO report, and research and journal papers were examined to provide supporting evidences to the discussion.

The analysis of data included examining, categorizing, and arranging the evidence examined in order to address the issues in terms of teacher education supply and development; facilities, equipment, and resources; curriculum flexibility, monitoring, and quality assurance; and community partnerships that make up the foundation of this study. Interpretations were made based on the categorization and

analysis of the content of relevant documents and the previous research data on physical education programme implementation in Malaysia.

Results and Discussions

Challenges in Achieving QPE in Malaysian Schools

Teacher-Related Challenges

In a study of 38 schools in the state of Selangor, Kamil et al. (2012) found that of the 413 teachers assigned to teach PE, only 28.1% had a Bachelor's degree in PE, and 71.9% were the non-PE majors. Previous study by the Ministry of Education (2008) reported that the majority of teachers who teach PE in Malaysian schools are non-specialist in the field, and only 30.8% of them hold a degree in PE. The unqualified PE teachers have raised some issues such as 'PE teachers only taught certain topics in the curriculum', 'PE teachers only taught topics that they were familiar with', 'PE teachers referred to book while teaching', and 'PE teachers did not have knowledge' (Mohd. Zairi et al. 2015). PE teachers' behaviour might be due to the lack of PE pedagogical knowledge (Noreha and Juslimah 2009) and the lack of dedication (Wuest and Fisette 2012). Wee (2014b) in a study of 1388 non-PE majors in Malaysian secondary school found that they lacked knowledge to teach PE and were having difficulties in teaching games skills. The non-PE majors were allocated PE classes by their superior without considering their qualification and interest, and it was merely to make-up the number of teaching period (Wee 2014b). The out-of-field teaching by non-PE majors is nothing new as the out-of-field teaching is prevalent in Malaysia, with the numbers increasing in a rapidly expanding school system (Umi Kalsum and Gusti Ngurah 2013).

Student-Related Challenges

Students surveyed revealed they were negative towards PE; lacked enthusiasm towards PE; uninterested in PE; not trying their best in PE class; and uninteresting PE lessons (Chong and Norlena 2010; Haslinda 2010). Earlier reports from the MOE (The Primary Schools Inspection Report 2007b; the Secondary Schools Inspection Report 2007a, 2008) reported that only 25–41% of the students attended PE classes punctually and they tried hard during class activities as well as wearing proper attire for PE (Haslinda 2010). Secondary school students were not interested in PE, especially girls. They were afraid of heat and often say that they are tired (Chong and Norlena 2010). In addition, Mohd. Zairi et al. (2015) reported their study of 99 students on their perception towards PE. They revealed that only 18.2%

of the students enjoyed PE classes very much, 19.2% perceived PE as sometimes bored, and 16.2% perceived PE as tiring and bored.

Administrative-Related Challenges

a. Supervision/Monitoring of PE teaching

Numerous observations from various sources were reported. According to Tan and Lee (2004), observation and supervision of PE lessons by principals did not take place. Similarly, Wee (2009) reported that only about 50.6% of principals 'frequently' and always' did so. In addition, there was no observation plan by the PE Curriculum Committee and teachers did not prepare their lessons (Kamil et al. 2012; Wee 2008). The lack of supervision in PE was reported in the PSIR and SSIR (2007); only 18.5% (8 of 46 schools) carried out the mandatory supervision at school level. As such, less than 50% of PE teachers in both the primary and secondary schools applied the progression principle (PSIR and SSIR 2007). Additionally of the 66.7% (of 36 secondary schools) that carried out the fitness test, about 20% did analysis and reported the findings but only 6% had remedial measures for students. In a study of the perceptions of 1388 non-PE majors, Wee (2014) reported that administrators did not observe the teaching of PE in schools.

b. PE classes are expendable

PE classes are expendable, as it is regularly used for the teaching of other more important subjects such as mathematics and science, especially when the public examination is around the corner. Chong and Norlena (2010) revealed that when examinations are approaching, PE classes are used for other subjects and to complete the syllabus of these subjects. New timetables were put in place. PE teachers could not do anything about this and merely followed instructions. This was earlier reported by Wee (2009) that 73.7% of principals 'always' allowed PE classes to be used to teach other subjects. This is supported by Kamil et al. (2012) where it was reported that time allocated for PE was inadequate.

c. Staff Training Programme (STP)

In Malaysia, the Ministry of Education requirements (MOE 1998) specified that school principals must plan, administer, and evaluate school STP. School heads must identify the strengths and weaknesses of the teaching staff and plan staff development programmes based on the identified needs. In addition, they must also monitor and take appropriate corrective action to change the STP to ensure its effectiveness. The status of STP was reported by Sebastian (2006), where 30.8% of schools never organized STP, and 62.9% organized 1–3 times annually. MOE (2007a) reported 29.4% secondary school organized STP. Similarly, Wee (2009) reported that only 14% of the principals in 290 secondary schools organized

in-house training programmes. The lack of staff development programme was also reported by Chong and Norlena (2010) and Wee (2013a). In addition, Wee (2014b) revealed that 52% of the administrators 'never' and 'rarely' organized STP.

Structure-Related Challenges

The problem of the lack of facilities and equipment was reported by Chong and Norlena (2010) and Syed Kamaruzaman et al. (2014). Most schools surveyed lacked equipment and spoilt equipment were not repaired or replaced. They drew the attention to the issue of too many students using the outdoor facilities at the same time. The lack of indoor facilities in schools and the weather conditions forced PE lessons to be conducted before 10.00 a.m. to avoid heat. Other earlier reports (MOE 1982, 1994/95) most schools examined had small and unkempt fields, schools lacked basic equipment for gymnastics and athletics and lacked game facilities, and at times, the lack of equipment was due to financial allocations in schools not properly planned for the procurement of equipment and the improper use of PE budget (Syed Kamaruzaman et al. 2014).

The National QPE Strategies

In this aspect, we examined the MOE continuous efforts in improving PE syllabus and pedagogy, other governmental initiatives such as 'sport-for-all' strategies, namely the Strategic Plan (2010–2015) of the Ministry of Youth and Sport Malaysia and the '1Student, 1Sport' policy of the MOE, the initiatives by the MOE's Teacher Training Division in training more qualified PE teachers, and the initiatives by the private sectors in providing training for sport and recreation through private facilities.

Continuous Efforts in Improving PE Syllabus and Pedagogy

The PE curriculum was developed in 1983 for primary schools and in 1988 for secondary schools (Wee 2013b). The PE curriculums were reviewed in 2003 and 2006 for primary schools and secondary schools, respectively (Wee 2013b). In 2011, the primary school PE curriculum was again reviewed, followed by another review for secondary school in 2014 (Wee 2013b). According to Wee (2013b), continuous efforts to impart new pedagogy knowledge through in-house training in PE have been emphasized in schools throughout Malaysia.

Similar effort to improve teaching and learning in school was pursued by the Ministry of Education Malaysia. In 2009, the Education National Key Results Areas (NKRAs) under the Government Transformation Programme (GTP) have been established to improve students' performance in schools in addition to

providing them with access to better quality education. This was implemented under the concept of high performing schools, which focused on the development of students beyond academic achievements. Malaysian Government has since developed more than 100 high-performance schools (MOE 2016).

The Strategic Plan (2010–2015) of the Ministry of Youth and Sport Malaysia and the '1Student, 1Sport' Policy of the MOE

The important role PE can also be seen as a part of the Strategic Plan (2010–2015) of the Ministry of Youth and Sport Malaysia (MYSM 2009). The plan included among others the initiative to make sport for all a Malaysian culture. This is to be done through its Third Thrust, which is to promote the sport culture among individuals and to achieve a sporting nation. To complement PE programme in school, Ministry of Education Malaysia has introduced 'sport' as a new subject into the school timetables. This is implemented under the '1Student, 1Sport' policy where secondary school students would get 90 min a week to play a game of their choice, while primary pupils would spend 60 min weekly (Wee 2013b). This programme facilitated access to all students especially those who are least active/inactive to benefit from participation in sports and consequently increase student participation in at least one type of sport. This would create talented students not only in terms of academic but also in extra-curricular activities. Similarly, MYSM complements the '1Student 1Sport' programme in strengthening the development programme in producing elite athletes through sport schools.

Teacher Education Supply and Development

The supply and development of teachers is tasked to the MOE's Teacher Training Division (TTD). In Malaysia, PE teachers are trained under a centralized system of teacher preparation. The MOE plans the curriculums, selects the trainee teachers, finances the cost of training for the training in teacher training colleges, and awards teaching scholarships to undergraduates in the universities (Wee 2013a). TTD has embarked on a transformation programme to produce more PE teachers through the short-, medium-, and long-term approaches. The details of the programme are shown in Fig. 1.

In addition, in order to overcome the shortage of PE teachers, MOE has introduced a new 6-week pilot Intervention Training Program for Extra Option Secondary School Teachers (Pito). This programme has started in December 2011 at several public universities, targeted the science and mathematics teachers nationwide. The teachers selected for the programme will choose history, PE or geography as their second option subject. However, it is still unclear if teachers would choose the PE subject as their second option subject (Wee 2014a).

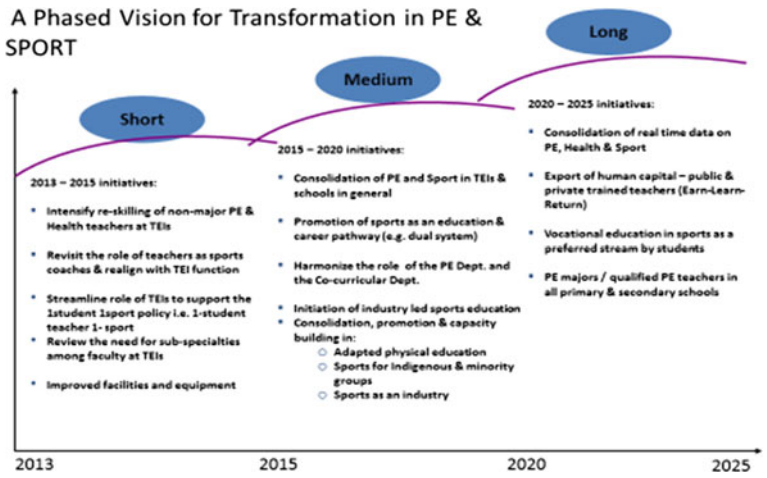


Fig. 1 Future direction for teacher education (MOE 2012)

Community Partnerships

This initiative by the private sectors involved the provision of training for sport and recreation through private facilities or using the existing school facilities. Programmes and initiatives to develop non-academic components are present both during formal class time and through a variety of after-school co-curricular activities (Wee 2014a). The shortage of facilities, equipment, and teachers are overcome through the initiatives of private companies. The private sectors responded well in providing training for sport and recreation through various private facilities. Private companies train children in various aspects such as games, self-defence, swimming, and gymnastics. Children can improve their badminton skills with paid coaching classes offered by trained coaches (Wee 2014a). Similarly, gymnastic centres train children in gymnastic skills and promote self-confidence. At times, private companies are also involved directly in school co-curricular activities. Activities such as gymnastics and self-defence (Tae-kwon-do, karate, Wushu and Silat) are incorporated into the school co-curriculum programme. Students are allowed to register in the particular programmes that they are interested in. Private sectors support the school programmes by providing qualified coaches. The coaches would be paid for by the school through students' subscription (Wee 2014a).

Monitoring and Quality Assurance in PE

Malaysia's present education system has only a PE curriculum. All schools in Malaysia implement the same PE curriculum, teach the same number of periods weekly, and use the standard textbooks supplied by Textbook Division of the Ministry of Education. The Textbook Division of the Ministry of Education

Malaysia coordinates the preparation of textbooks for three types of primary schools in Malaysia, namely national, vernacular Chinese, and vernacular Tamil schools (Wee 2014a). Although the Chinese PE book is prepared in Chinese language, the Tamil PE book is translated into the Tamil language based on the Chinese PE textbook due to the small number of Tamil schools. Only a single textbook is prepared for secondary schools (Wee 2013b).

In the effort of maintaining quality, besides the continuous efforts in improving PE syllabus and pedagogy, the standardized and revised new curriculum by MOE was distributed to all schools in Malaysia (Wee 2014a).

Facilities, Equipment, and Resources

Wee (2001) and Sebastian (2006) surveyed secondary schools in Peninsular Malaysia (300 schools) and Sarawak and found that majority of the schools often have a soccer field (77.2%, 92.3%), netball court (75.7%, 76.9%), volleyball court (71.6%, 61.5%), and badminton court (56.7%, 69.3%). However, Syed Kamaruzaman et al. (2014) in a survey of 310 PE teachers from 155 schools in the State of Perak found that the PE facilities were inadequate (mean = 4.2) and often the fields or open spaces were crowded because many classes were scheduled to use at the same time. Syed Kamaruzaman et al. (2014) also found that fields were unsafe to be used by the students, and the fields were often narrow. As for the equipment, it was reported insufficient as broken equipment was not replaced or repaired. Similarly, Kamil et al. (2012) in a study of 416 PE teachers in 38 schools in the state of Selangor revealed that almost 72% of the PE teachers were not qualified. Kamil et al. (2012) also found that schools shared PE facilities during the same duration, thus contributing to limited spaces and hindered student physical activities. On the other hand, Syed Kamaruzaman et al. (2014) found that the shortage of PE option teachers has prompted the schools to combine two classes at one time and PE teachers were asked to teach PE to 70–80 students. This has contributed to insufficient equipment and lack of facilities in the PE classes.

In addition, MOE has prepared a teacher guidebook for PE to help PE teachers in teaching and to ensure the content delivery (Wee 2014a). Currently, the guidebook for PE is available online. Besides the resources from MOE, the Health Promotion Board of Malaysia (HPBM) has produced numerous resources to be used as teaching and reference materials by HPE students and teachers. The resources include Basic Health Promotion Programme (2011), Prevention of Obesity Module (2011) and Presentation slides, Health Promotion Programme: Healthy Eating (2011) Module and Presentation Slides, and Health Promotion Programme: Physical Activities (2011) Module and Presentation Slides (Wee 2014a).

Contributions of the Study

This paper provided in-depth deliberation on the implementation of PE in Malaysian schools. It has provided various information on the challenges in the teaching of PE and in the implementation of PE programme in schools. It also provided information on the availability of teaching and learning resources. Lastly, it has also provided information on the synergistic efforts from the public and private sectors in overcoming issues in the teaching and learning of PE in schools.

Conclusions

It is hoped that this paper has contributed to the ensuing debates on the teaching and learning of PE in schools. PE curriculum and its implementation has been the profound interest of various strata of the Malaysian society. Quality PE classes are expected to incorporate curriculum that help students to develop knowledge, skills, behaviours, attitudes, and confidence to adopt and maintain healthy lifestyles. Learning in PE is through the psychomotor, cognitive, and affective domains and is imperative in developing an all-rounded person.

References

Association for Physical Education (afPE). (2008). *Health position paper*. Worcester: afPE.

Chong, A. L., & Norlena, S. (2010). Pelaksanaan mata pelajaran pendidikan jasmani di sekolah menengah: Satu kajian awa [The implementation of physical education in secondary school: A preliminary study]. In *Proceedings of the International Seminar Comparative Studies in Educational System between Indonesia and Malaysia* (pp. 955–971). University of Education Indonesia, Bandung.

Haslinda, N. (2010). *Perceptions of teachers and students on physical education and the dressing of sport attire during physical education in Central Johore Bahru* (In National Language of Malaysia). Bachelor of Sports Science Thesis, University of technology Malaysia.

Institute of [IOM]. (2013). *Educating the student body: Taking physical activity and physical education to school*. Washington, DC: National Academies Press.

Kamil, A. A., Saidon, A., Kok, L. Y., & Bahaman, A. S. (2012). Assessment of implementation level of the physical education program in Selangor secondary schools, Malaysia. *Wulfenia Journal, 19*(10), 108–124.

Lee, S. T., Wong, J. E., Shanita, S. N., Ismail, M. N., Deurenberg, P., & Poh, B. K. (2015). Daily physical activity and screen time, but not other sedentary, are associated with measures of obesity during childhood. *International Journal of Environmental Research and Public Health, 12,* 146–161.

Ministry of Education, Malaysia (1982). Report on the teaching of physical education in schools in Klang District, Selangor (In National Language of Malaysia). Kuala Lumpur: Federal Inspectors of Schools, Ministry of Education Malaysia.

Ministry of Education. (1994/95). Report on the Teaching of Physical Education in Secondary School (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education Malaysia (1998). Surat Pekeliling Ikhtisas [Letter of professional service]. *Bil. 2/1998* (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education Malaysia. (2007a). *Laporan Pengajaran Pendidikan Jasmani di Sekolah Menengah [Secondary School Inspectorate Report]* (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education Malaysia. (2007b). *Laporan Pengajaran Pendidikan Jasmani di Sekolah Rendah [Primary School Inspectorate Report]* (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education Malaysia. (2008). *Laporan Pengajaran Pendidikan Jasmani di Sekolah Menengah [Secondary School Inspectorate Report]* (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education Malaysia. (2009). *Checklist items of the federal inspectorate of schools*. Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education.

Ministry of Education. (2012). *Malaysia education blueprint 2013-2025: Preliminary report—Executive summary*. Putrajaya: Ministry of Education Malaysia.

Ministry of Youth and Sport Malaysia [MYSM]. (2009). *Pelan Strategik 2010-2015 [Strategic Plan 2010-2015]* (In National Language). Putrajaya: Ministry of Youth and Sport.

Mohd. Zairi, H., Azman, H., Nur Bahiyah, A. W., & Julia, J. (2015). Determining teaching effectiveness for physical education teacher. *Procedia-Social and Behavioral Sciences, 172* (2015), 733–740.

MOE. (2016). *High performance schools*. Retrived from http://www.moe.gov.my/en/sekolah-berprestasi-tinggi

Noreha, S., & Juslimah, J. (2009). *Pedagogical content knowledge of form four physical education teachers in four districts in Ulu Kinta, Perak*. Paper presented at the physical education conference 2009 Malaysia, Faculty of Educational Studies, University Putra Malaysia, February 13–15, 2009.

Pangrazi, D., & Brusseau, S. (2014). *Dynamic physical education for secondary school students*. Harlow, Essex: Pearson Education Limited.

Pate, R. R., Mitchell, J. A., Byun, W., & Dowda, M. (2011). Sedentary behaviour in youth. *British Journal of Sports Medicine, 45,* 906–913.

Primary School Inspectorate Report [PSIR](2007). (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education Malaysia.

Sebastian, B. A. S. (2006). *Comparative study of the implementation of physical education programme in Bintulu and Shah Alam secondary schools*. Uniniversiti of Teknologi MARA: Undergraduate Project.

Secondary School Inspectorate Report [SSIR](2007). (In National Language of Malaysia). Kuala Lumpur: Federal Inspectorate of Schools, Ministry of Education Malaysia.

SHAPE America [Society of Health and Physical Educators]. (2016). *Shape of the nation: Status of physical education in the US*. Retrieved from http://www.shapeamerica.org/advocacy/son/2016/upload/Shape-of-the-Nation-2016_web.pdf

Syed Kamaruzaman, S. A., Muhammad Akbar, Z., & Rahmad Sukor, A. S. (2014). Influence of school environment in the teaching and learning of physical education. *Turkish Journal of Sport and Exercise, 16*(2), 70–76.

Tan, S. E., & Lee, F. K. (2004). Reviving physical education in schools: A small dosage of management and commitment from the educational leaders. *The Journal of Administrative Science, 14*(1), 45–52.

Umi Kalsum, M. S., & Gusti Ngurah, D. (2013). Differences between in-field and out-of-field history teachers influence on students learning experience in Malaysian secondary schools. *Creative Education, 4*(9), 5–9.

UNESCO Final Report. (2013). *World-wide survey of school physical education*. Paris, France: UNESCO.

UNESCO. (2015). *Quality physical education*. Paris, France: UNESCO.

U.S. Department of Health and Human Services. (2008). *2008 physical activity guidelines for Americans*. Washington, DC.

U.S. Department of Health and Human Services [USDHHS]. (2010). *The surgeon general's vision for a healthy and fit nation*. Rockville, MD: U.S. Department of Health and Human Services, Office of the Surgeon General.

Wafa, S. W., Hamzaid, H., Talib, R. A., & Reilly, J. J. (2014). Objectively measured habitual physical activity and sedentary behaviour in obese and non-obese Malaysian children. *Journal of Tropical Pediatrics, 60,* 161–163.

Wee, E. H. (2001). *Attitude of physical education teachers toward physical education and the implementation of physical education programme in secondary schools* (Ph.D. Thesis). University of Malaya, Kuala Lumpur, Malaysia.

Wee, E. H. (2008). Physical education in Malaysia: A case study of fitness activity in secondary school physical education classes. In *UNESCO, innovative practices in physical education and sports in Asia*. Bangkok: UNESCO Asia and Pacific Regional Bureau for Education.

Wee, E. H. (2009). Management and leadership issues in the implementation of an academic program: A case study of physical education program. *The Journal of Administrative Science, 6*(2), 27–45.

Wee, E. H. (2013a). Contemporary issues in the teaching of PE in Malaysia. *Journal of Physical Activity, Sports and Exercise, 1,* 17–20.

Wee, E. H. (2013b). Trends in health and physical education pedagogy in Malaysia. *The Global Journal of Health and Physical Education Pedagogy, 2*(2), 85–102.

Wee, E. H. (2014a). Physical education in Malaysia: Fusion of public and private efforts. In M. K. Chin & C. R. Edginton (Eds.), *Physical education and health: Global perspectives and best practice* (pp. 297–310). Urbana, IL: Sagamore.

Wee, E. H. (2014b). Perceptions of non-PE major teachers on the implementation of Malaysian secondary school PE program. In *Proceeding of the 7th International Scientific Conference on Kinesiology*. Opatija, Croatia, May 22–25, 2014.

Wong, J. E., Parikh, P., Poh, B. K., & Deurenberg, P. (2016). Physical activity of malaysian primary school children: Comparison by sociodemographic variables and activity domains. *Asia Pacific Journal of Public Health, 28*(5S), 35S–46S.

Wuest, D. A., & Fisette, J. L. (2012). *Foundations of physical education, exercise science and sport*. NY: McGraw-Hill.

Higher Education Policy Governing the Future Vocational Skills Development in the Hospitality Sector—An Example from Ireland

Ralf Burbach

Abstract While tourism figures are set to increase worldwide, there exists a palpable skills shortage in the broader tourism and hospitality industry at all levels. Nevertheless, most governments appear to be slow to address this skills shortage at a strategic policy level. Using the Irish context as an example, this paper aims to evaluate government higher education (HE) policy responses to skills shortages in other sectors such as the medical devices and ICT sectors and to assess whether and to what extent these could be applied to the hospitality and tourism (H&T) sector. The lessons learned from the Irish example can also be applied to other countries that experience a significant growth in tourist numbers and that are faced with similar skills shortages.

Keywords Higher education policy · Hospitality and tourism · Ireland · Vocational skills development

Introduction

Industry data on the hospitality and tourism industry for the last number of years have consistently demonstrated that there exists a skills shortage at all levels in the industry not just in Ireland, but all over the world. The World Travel & Tourism Council highlights that 37 of 46 countries in their 2015 report struggle with a talent deficit in this sector (WTTC 2015). This is due largely to a sharp increase in tourism figures in recent years, which is set to be sustained into the near future (UNWTO 2015). In the Irish context, the Expert Group on Future Skills Needs (EGFSN) (EGFSN 2015) predicts a skills shortage of up to 13.6% and a total skills demand of about 100,000 people in the period up to 2020. Yet, the Irish Government like

R. Burbach (✉)
School of Hospitality Management and Tourism,
Dublin Institute of Technology, Dublin 1, Ireland
e-mail: ralf.burbach@dit.ie

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_21

many other governments has failed to date to respond at a policy level to this skills shortage. Other industries, such as the information and communication technology (ICT) sector, are facing similar shortages. The Irish Government's response to shortages in other sectors has been both comprehensive and multi-faceted. The aims of this paper are to evaluate Irish Government higher education (HE) policy responses to skills shortages in other sectors such as the medical devices and ICT sectors and to assess whether and to what extent these could be applied to the hospitality and tourism (H&T) sector.

Research Problem

Coordinated successful government HE policy responses to demonstrated skills shortages appear to be few and far between. Yet, the skills shortage, which negatively affects the broader H&T industry, is tangible and well documented. Some best practice approaches to addressing skills shortages exist. However, the question arises as to whether these may be applicable to the H&T industry.

Objectives of the Study

The key objectives of this study are to assess government HE policy responses to skills shortages in different sectors with a view to replicating these in the H&T sector.

Research Methodology

This paper is exploratory and explanatory in nature. The data collection method is based primarily on secondary research of reports, policy documents and news items published on the Internet, which are alluded to and referenced in this paper. This information is supplemented with information obtained as part of the researcher's involvement in the steering group for the EGFSN on Assessing the Future Skill Needs of the Hospitality Sector 2015–2020 (EGFSN 2015). The steering group consisted of 13 members which represent various industry bodies, education providers, government agencies and recruitment agencies.

Results and Discussions

The H&T sector in Ireland continues to grow and 2014 saw a year of increase of 8.9% to 7.6 million visitors, which generated the equivalent of 20.7 billion Malaysian ringgit (4.7 billion euros) in revenue (CSO 2015). There are currently

139,800 people employed in the sector. This equates to 7.4% of total employment (CSO 2014b). However, overall tourism-related employment is closer to 200,000 (Fáilte Ireland 2015). In fact, the World Tourism Organisation asserts that one in every 11 jobs is tourism related (UNWTO 2015). According to the Irish Central Statistics Office (CSO), the accommodation and food service activities sector showed the highest growth in employment among all industry sectors in 2013 (CSO 2014b). By 2025, the Irish Government expects visitor numbers to rise to 10 million, which will generate 5 billion euros to the economy as well as provide 250,000 jobs (Fáilte Ireland 2015). Considering the expected prolonged growth in tourist numbers and growth in the number of jobs associated with the industry, evidence suggests that a significant skills shortage in all areas (front and back of house) will develop if this was not addressed (EGFSN 2015). While the demand for third-level graduates from the industry is high, for instance, hotel corporation's graduate management programmes only focus on honours degree graduates (Jooss and Burbach 2016), the skills levels in the H&T sector tend to be low. According to the 2011 Census (CSO 2014a), only 19% of staff in the sector possess a third-level degree or higher. The vast majority (74%) of employees hold an upper secondary school qualification or less; 22% do not have an upper secondary school qualification. Given the growth in employment and the current arguably low levels of educational attainments of employees in this sector, government support in terms of policies is required to remedy this discrepancy.

Existing HE Policies Governing the H&T Sector

Irish education policy in the H&T sector dates back to 1963 when CERT (the Council for Education, Recruitment and Training) was established by the Irish tourism board, now Fáilte Ireland, to deliver education and training in the developing tourism sector. Due to a change in government policy, that is a move away from training provision, and the resulting lack of funding, the provision of these de facto apprenticeships ceased. In the absence of any government policy, a small number of Vocational Training Colleges provide H&T-related programmes. In addition, most Institutes of Technologies (polytechnics) offer various undergraduate degree programmes in the broader H&T sector. According to figures obtained from the Irish Higher Education Authority, almost 1000 students graduated from these programmes in 2012. However, the number of students graduating from these programmes is insufficient to satisfy the demand from industry. In 2013, the Irish Government announced a renewal of the apprenticeship system, and in 2016, the Department of Jobs, Enterprise and Innovation (DJEI) sets up a nationwide hospitality skills oversight group to advise on strategy and policy in response to the skills needs report mentioned above (EGFSN 2015).

Government HE Policy Responses to Skills Shortages

Ireland's economic success story has often been attributed to its ability to attract foreign direct investment (FDI) in areas such as medical devices, information and communication technology (ICT) and pharmaceuticals, and the government has taken various steps to address skills shortages in areas considered to be pertinent to the continued success of Ireland in attracting FDI.

At secondary school level, the Irish Government introduced bonus high school points in 2010 for those students taking advanced mathematics as a subject, which has arguably led to an increase in students taking the subject and, perhaps to a lesser extent, augmented the number of students opting for third-level courses related to the smart economy (Donnelly 2014). However, an initiative such as this cannot exist in isolation and thus ought to be combined with complementary stratagems. In 2013, the EGFSN released a report that identified the future skills needs in the ICT sector up to 2018 (EGFSN 2013), which highlighted a shortage of 44,500 employees over the following six years and furnished a number of recommendations. These included a revision of the existing ICT Action Plan (launched in 2012), ameliorating the quality and quantity of ICT skills, attracting ICT talent, improving the attractiveness of Ireland as an ICT hub and tackling the ICT skills issue (by introducing a variety of programmes to improve ICT skills). The updated ICT Skills Action Plan represents collaboration between government, industry and education (DJEI 2013). Measures included in the plan to address the ICT skills shortage, which could also be adopted to address the H&T sector skills shortage comprised of conversion and reskilling in HE programmes, efforts to double the number of graduates, to provide specific ICT programmes for the industry, to develop a web-based portal to expedite work placements, and to generate an awareness of ICT in education (DJEI 2013). These schemes have been replicated successfully in the medical devices sector.

Another piece of the jigsaw is the Springboard initiative, which has been in operation successfully for a number of years now. This initiative is aimed at reducing the number of unemployed by providing short courses of up to one year in length designed to furnish participants with the necessary skills to re-enter the labour market. Springboard has always included a call for programmes in ICT skills conversion, medical devices and logistics. For the last two years, funding is also available for H&T programmes. Arguably, there exists a danger in focusing a large amount of resources on addressing skills needs in a particular sector, as experience has shown that shifts in economic fortune or an oversupply of labour in a specific area may have long-term detrimental effects for the skills development in other sectors and the economy as a whole. For instance, over the last number of years, vast resources have been expended to retrain jobless engineers, which is a legacy of the (failed) Irish property boom. Thus, any strategy to address skills needs must be both short term and long term, comprehensive, multi-faceted and multi-level, and its potential consequences (particular on skills development in other areas) have to be very well thought through.

Potential Government HE Policy Responses to Skills Shortages in the H&T Sector

As the skills shortages in the H&T sector appear to be immediate as well as ongoing, strategies to address these shortages ought to be both short term and long term in nature. However, it is crucial that even the short-term solutions feed into a long-term strategy. Similar to the ICT Action Plan, an H&T action plan should be a collaborative undertaking involving industry, education and the government. Furthermore, the attractiveness of and the broad range of opportunities within the industry need to be promoted. The Irish Hotels Federation with its 'Get a Life in Tourism' initiative and the Irish Hospitality Institute with its 'Tourism Insight' programme (a series of online modules for secondary school pupils) provide an initial step towards this aim (Tourism Insight 2016). Above all, it is essential to garner industry buy-in, as the training and internship must take place in industry and some solutions can only be delivered in conjunction with industry.

In the short term, approaches should include a comprehensive suite of short courses in a variety of key H&T areas *inter alia* front office, reservations, food and beverage service, baking, pastry and other culinary skills. The government should introduce a model comparable to the City and Guilds qualifications (e.g. City and Guilds 2015), which represented the industry standard for many years. However, each short course should be accredited and should, if accrued, lead to a qualification on the Irish qualifications framework. In order to centralise the provision and in order to make these programmes more attractive to employers and employees, some of the programme delivery should be online. Currently, however, the provision is far too fragmented and much regulation is needed in order to address this.

Following the ICT Action Plan, the government should support one-year conversion undergraduate and postgraduate programmes in order to retrain existing graduates from other disciplines.

Another mechanism to attract people to the industry could be the JobBridge scheme, which offers unpaid job placements to the unemployed to gain industry experience (Department of Social Protection 2015). However, this scheme should incorporate a HE component to ensure that participants do not just gain an internship but also an opportunity to further their education. Yet, this scheme is not without its critics and RTÉ (the national broadcaster) even referred to it as a 'JobBridge to nowhere for some interns' (RTÉ 2014).

Using the ICT Skills Action Plan as a template (DJEI 2013), the key to success in creating greater awareness of opportunities in the H&T sector is a range of high school-based programmes. For instance, higher education institutes (HEI) as well as industry representative organisations should follow the example of the Irish Hotels Federation, which has set up regular visits to schools and the 'Careers in Tourism' initiative to promote jobs in the industry. Moreover, subjects related to the H&T sector should be introduced at primary and secondary school levels. This of course

would also necessitate a degree of retraining of existing teachers in order to be able to deliver these subjects as well as a national curriculum and additional government funding in these areas.

Following on from this, two- to three-year apprenticeships with a national curriculum, similar to those in the German dual vocational training system, should be introduced. The German system relies on input from both employers and vocational training colleges in equal measure that requires a high level of regulation and, above all, buy-in from employers. However, this could be problematic in the Irish context without the necessary guidance from government, due to the large number of interest groups and the fragmented nature of the education and training sector. Deficiencies in the German system have illustrated that it is critical to incorporate access routes to HE. Graf (2012, p. 49), for instance, highlights the 'historically evolved strong institutional divide between the vocational education and training system and the HE system' of the German model. This divide was further cemented by the introduction of the new German qualification framework in 2012. Austria, Switzerland and Denmark on the other hand introduced measures, which created vocational training models with more flexibility and with better access routes to HE (Ebner 2009).

Another HE option is the fastest growing segment of German and Austrian HE, which have dual study programmes. In Germany, for example, the student numbers on these courses grew by 21% in 2011 (Graf 2012). These are offered by so-called *Duale Hochschulen* (Dual Universities of Applied Sciences). Founded upon the same principles as vocational training in Germany, students in dual HE spend as much time in industry as they do in college, which makes them more attractive to industry. Owing to the applied nature of the H&T sector, this model could be an ideal solution to any skills shortages, as the students remain employees of the same employer, which sponsors the students, throughout the programme.

Contributions of the Study

This paper adds to the body of knowledge in vocational education by elucidating the need for a set of government policies to overcome a demonstrated skills need in a particular sector. Furthermore, the paper offers a number of comparisons and practical solutions to address the labour shortage in the H&T sector.

Conclusions

In the absence of HE policy to ensure the future skills development in the H&T sector, this paper endeavours to explore potential strategies to address the labour shortage in the sector in the future. It is evident that there exist no 'quick fix' solutions to remedy any labour shortages. Nevertheless, as these shortages are

acute, both short-term and long-term strategies are required. The paper also highlights that any solution ought to be comprehensive, multi-faceted, multi-level and well thought out, in addition to the formation of any policy that necessitates the close collaboration of government agencies, education and industry.

References

City and Guilds. (2015). *Hospitality and catering*. Accessed: December 20, 2014, available: http://bit.ly/29OXrxJ

CSO. (2014a). *Census 2011—Ireland and Northern Ireland*. Ireland, Cork: Central Statistics Office.

CSO. (2014b). *Employment (ILO) by NACE Rev 2 economic sector*. Central Statistics Office. Accessed: January 20, 2015, available: http://bit.ly/29CTvfx

CSO. (2015). *Overseas travel October–December 2014*. Central Statistics Office. Accessed: January 29, 2015, available: http://bit.ly/29JX1Z1

DJEI. (2013). *ICT skills action plan*. Accessed: December 20, 2015, available: http://bit.ly/29EFleq

Department of Social Protection. (2015). JobBridge. Accessed: December 20, 2015, available: http://bit.ly/29DWXMK

Donnelly, K. (2014). *Bonus points attract record entry for higher-level maths*, Independent, 03/03/2014. Accessed: January 30, 2015, available: http://bit.ly/29EHOp8

Ebner, C. (2009). *Neue Wege für die duale Berufsausbildung – ein Blick auf Österreich, die Schweiz und Dänemark, WZBrief Arbeit 04, November 2009*. Germany: Wissenschaftszentrum Berlin für Sozialforschung, Berlin.

EGFSN. (2013). *Addressing future demand for high-level ICT skills*. Forfás, Dublin: Ireland.

EGFSN. (2015). *Assessment of future skills requirements in the hospitality sector in Ireland, 2015-2020*. Forfás, Dublin: Ireland.

Fáilte Ireland. (2015). 2014: *Confirmation of an outstanding year for tourism—Donohoe*, January 28, 2015. Accessed: January 30, 2015, available: http://bit.ly/29QACIW

Graf, L. (2012). *Wachstum in der Nische mit dualen Studiengängen entstehen Hybride von Berufs- und Hochschulbildung, WZB Mitteilungen, Heft 138, Dezember 2012*. Germany: Wissenschaftszentrum Berlin für Sozialforschung, Berlin.

Jooss, S., & Burbach, R. (2016). Global talent management in the international hospitality industry: The role of graduate management programmes. In *12th Annual Tourism Hospitality Research Ireland Conference (THRIC), Limerick, Ireland*, June 16–17, 2016.

RTÉ. (2014). *JobBridge to nowhere for some interns*, October 31, 2014. Accessed: December 20, 2014, available: http://bit.ly/1ubAU37

Tourism Insight. (2016). *National tourism careers drive launched*. Accessed: September 30, 2016, available: http://bit.ly/2eatH0p

UNWTO. (2015). *UNWTO tourism highlights, 2015 edition*. Madrid, Spain: World Tourism Organisation. Accessed: April 25, 2016, available: http://bit.ly/1RtFdN9

WTTC. (2015). Global talent trends and issues for the travel & tourism sector. London, United Kingdom: World Travel & Tourism Council. Accessed April 20, 2016, available: http://bit.ly/29YKuTv

Developing Digital Pedagogy: The Impact of National Strategy and Enhancement Themes in an Irish Institute of Higher Education

Nuala Harding, Lisa O'Regan, Moira Maguire, Mark Brown, Seamus Ryan, Geraldine McDermott, Orna Farrell, Morag Munro, Gerry Gallagher, David Cranny, Conor McKevitt, Edel Healy, Ronan Bree, Don Faller, Anne Mulvihill, Jeremy Bird, Akinlolu Akande, David Doyle, David Dowling, Dina Brazil and Gina Noonan

Abstract The Irish Higher Education sector has experienced a variety of key policy developments in the recent past. The publication of a 'National Strategy for Higher Education to 2030' was followed by the establishment of the National Forum for the Enhancement of Teaching and Learning (NFETL) and the subsequent publication of 'A Roadmap for Enhancement in a Digital World' 2015–2017. In tandem, the National Forum devised the first national enhancement theme 'Teaching for Transition' and more recently 'Assessment for, as and of Learning' with research funding allocated. This paper will discuss two current national

N. Harding (✉) · S. Ryan · G. McDermott
Learning and Teaching Unit, Athlone Institute of Technology, Athlone, Ireland
e-mail: nharding@ait.ie

S. Ryan
e-mail: sryan@ait.ie

G. McDermott
e-mail: gmcdermott@ait.ie

L. O'Regan · M. Munro
Centre for Teaching and Learning, Maynooth University, Maynooth, Ireland
e-mail: lisa.oregan@nuim.ie

M. Munro
e-mail: morag.munro@nuim.ie

M. Maguire · G. Gallagher · D. Cranny · C. McKevitt
Centre for Excellence in Learning and Teaching,
Dundalk Institute of Technology, Dundalk, Ireland
e-mail: moira.maguire@dkit.ie

G. Gallagher
e-mail: gerry.gallagher@dkit.ie

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_22

educational research projects that focus on the development of digital pedagogy. The first focuses on supporting transition through enhancing feedback in first year using digital technologies. Y1Feedback is a two-year (2015–2017) multi-institutional change project involving two universities and two institutes of technology (IoTs). Informed by both an analysis of current assessment and feedback practices across the four partner institutions, in addition to a review of the literature, a number of themes for action emerged, including embedding assessment and feedback literacies, provide opportunities for dialogic feedback and fostering sustainable feedback practices that encourage self-regulated learning. These informed the development of a range of approaches to implementing technology-enabled feedback. A complementary project, the Technology Enhanced Assessment Methods (TEAM) for Science and Health Practical Settings project, also funded by NFETL, involves four IoTs. The development of both technical and soft skills is considered essential in terms of both student learning and employability, in Science and Health Practical Settings. The IoT sector, in particular, places a major value on producing graduates who are 'workplace ready' with an emphasis on developing practical skills. Assessment plays a key role in influencing student learning, effort and engagement. The TEAM project (2016–2018) is exploring the potential offered by digital technologies to address concerns such as over-assessment, authenticity and graduate skill development, particularly as there is considerable scope for improvement in practical assessment practices at undergraduate level. This paper will outline the activities in the project phases for each project. In keeping with the timing of the projects, findings will be presented. The

D. Cranny
e-mail: david.cranny@dkit.ie

C. McKevitt
e-mail: conor.mckevitt@dkit.ie

M. Brown · O. Farrell
National Institute for Digital Learning, Dublin City University, Dublin, Ireland
e-mail: mark.brown@dcu.ie

O. Farrell
e-mail: orna.farrell@dcu.ie

E. Healy · R. Bree
School of Health and Science, Dundalk Institute of Technology, Dundalk, Ireland
e-mail: edel.healy@dkit.ie

R. Bree
e-mail: ronan.bree@dkit.ie

D. Faller · A. Mulvihill
Faculty of Science and Health, Athlone Institute of Technology, Athlone, Ireland
e-mail: dfaller@ait.ie

A. Mulvihill
e-mail: amulvihill@ait.ie

paper will explore how these projects are both supporting national strategic objectives and used to leverage curriculum enhancement within an Irish institute of Higher Education including the engagement of students as partners and the development of digital and assessment literacies amongst staff and students.

Keywords Curriculum enhancement · Digital and assessment literacies · Digital pedagogy · Feedback

Introduction

Recent European and national policy, and strategic developments have provided the opportunity to Irish institutes for Higher Education (HE) to work collaboratively in educational research projects (DES 2011; European Commission 2013; NFETL 2015). Enhancement funding is provided by the NFETL through a competitive bidding process, supported by the Irish Higher Education Authority (HEA). This seeks to address key recommendations articulated in the recent publication 'A Roadmap for Enhancement in a Digital World' 2015–2017 (NFETL 2015).

The Athlone Institute of Technology (AIT), in collaboration with partner institutes, was awarded funding for two national multi-institute projects which are the focus of this paper. Both projects seek to assist in achieving specific recommendations of the digital roadmap. Accomplished by 'strengthening collaboration within and between institutions, and with different parts of the higher education sector' and 'developing shared policies and infrastructure that reflect the complexity of an increasingly digital world', in addition, the projects will assist in developing 'a consistent, seamless and coherent digital experience for students in Irish higher

J. Bird · A. Akande · D. Doyle
School of Science, Institute of Technology, Sligo, Ireland
e-mail: bird.jeremy@itsligo.ie

A. Akande
e-mail: akande.akinlolu@itsligo.ie

D. Doyle
e-mail: doyle.david@itsligo.ie

D. Dowling · D. Brazil
Faculty of Science, Institute of Technology, Carlow, Ireland
e-mail: david.dowling@itcarlow.ie

D. Brazil
e-mail: dina.brazil@itcarlow.ie

G. Noonan
Teaching and Learning Centre, Institute of Technology, Carlow, Ireland
e-mail: gina.noonan@itcarlow.ie

education' while actively engaging 'with students and teachers to develop their digital skills and knowledge', finally the projects seek to 'develop a strong evidence base for enhanced pedagogy' (NFETL 2015). Therefore, both projects have the potential to make key contributions in enhancing curriculum design and informing the development of pedagogical, digital and assessment practices.

The Supporting Transition: Enhancing Feedback in First Year Using Digital Technologies—*Y1Feedback project* is a two-year multi-institutional change project which commenced in 2015. This collaborative initiative is led by Maynooth University in partnership with AIT, Dublin City University (DCU) and Dundalk Institute of Technology (DkIT). It is designed to support first-year students in their transition to higher education through enhancing feedback using digital technologies. The *Technology Enhanced Assessment Methods (TEAM) for Science and Health Practical Settings* project is led by Dundalk Institute of Technology in collaboration with AIT, Institute of Technology Carlow and Institute of Technology Sligo and was designed to explore the potential offered by digital technologies to address concerns such as over-assessment, authenticity and graduate skill development. This project commenced in 2016.

As similar approaches were adopted in each project, this paper will initially provide an overview of the *Y1Feedback project,* by outlining the research questions identified, the aim of the study, the research methodologies adopted and a brief presentation and discussion of key findings to date. The overview of the *TEAM Project*, which commenced more recently, will outline the research questions and the aim of the study and present the model emerging for enhancing curriculum change, based on a synthesis of the literature. The contribution or impact of both projects will be discussed.

The Y1Feedback Project—Research Problem

Studies have suggested that 'feedback is one of the most powerful influences in learning and achievement (Hattie and Timperley 2007, p. 81; Y1Feedback 2016b). Indeed, it is further suggested that feedback has significant potential in supporting and enhancing student learning (Carless et al. 2011; Y1Feedback 2016b). In particular, feedback is deemed to be a fundamental way to facilitate students' development as independent learners who are able to monitor, evaluate and regulate their own learning (Ferguson 2011; Y1Feedback 2016b). This applies particularly to first year when supporting students to make a successful transition (Tinto 2005; Y1Feedback 2016b). It is also suggested that focusing on transition pedagogy can enhance the development of key digital and assessment literacies (Kift 2015; Y1Feedback 2016b). The Y1Feedback project was also designed, in response to documented evidence from the Irish Student Survey on Engagement (2014). The report indicated first-year students' dissatisfaction with feedback on academic

performance. First-year undergraduates when asked how often they received timely, written or oral feedback on academic performance responded 'never' (45.1%) or 'sometimes' (22.3%) (ISSE 2014; Y1Feedback 2016b). The ISSE is modelled on national studies in Australia (AUSSE) and the USA and Canada (NSSE), which reported similar findings in relation to feedback.

Aim

The overall aim for this project is to enhance feedback practice in first-year undergraduate programmes by identifying and developing case studies of technology—enabled feedback approaches in first year to support transition (Y1Feedback 2016a).

Research Methodology

Phase one of the project involved conducting a current practice review across the four participating HEIs with the aim of providing a snapshot of current feedback practice and student experience in first year. Utilising a mixed-methods approach, the review was conducted between April and June 2015. Semi-structured focus groups were conducted, one in each of the four participating institutions with 36 first-year class representatives participating from across a wide range of disciplines to identify their experience of feedback in first year. In addition, an online survey instrument was designed and deployed to academics teaching first-year students. 213 (30% of target population) staff participated in the online questionnaire, which sought to explore staff perceptions of feedback and feedback practices in first year. This study has been reported in a recent publication 'Feedback in First Year: A Landscape Snapshot'. Phase two of the project involved undertaking a review of current literature in order to inform the design of case studies in each participating institute. Findings are reported in a second publication 'Technology-Enabled Feedback in the First Year: A Synthesis of the Literature'. The final phase of the project involves the implementation and evaluation of case studies involving technology-enabled feedback and further dissemination of findings. 26 case studies are in progress across the four partner institutions, which are due for completion in January 2017. The case studies are being developed in partnership with 32 academic staff across 18 different disciplines with class sizes ranging from 10 to 750 students (O'Regan et al. 2016a).

Key Findings and Discussions

The snapshot of current feedback practice revealed interesting findings. In relation to staff and student perspectives, there emerged a shared value amongst both staff and students of feedback and the importance of feedback conversations. However, it also was apparent, in keeping with the findings from the ISSE, that students' experience of feedback in first year is inconsistent (Y1Feedback 2016a). Indeed, dissatisfaction around the timing, quantity and quality of feedback was also reported. Interestingly, students reported low use of formal peer involvement in feedback. Findings also suggested that, although there were some examples of the use of technology, in general, this was limited. Staff when queried on providing feedback to first years highlighted challenges such as lack of time, heavy workload, large classes and a dissatisfaction as a result of the lack of student engagement when given feedback (Y1Feedback 2016a). Some key suggestions emerged including the need for consistency in the provision of feedback across first-year modules; it also emerged that students would like to receive more feedback in a timely fashion (Y1Feedback 2016a).

The synthesis of literature provided current thinking on feedback in first year and the role it plays in transition pedagogy. In summary, it provided some key recommendations for implementing contemporary approaches to feedback that underpin the selection and implementation of case studies. These are that feedback should:

1. take place in formal and informal learning settings beyond assessment,
2. feed forward to future work and
3. be a dialogic process that ultimately supports learners to become self-regulating.

(Y1Feedback 2016b)

Specific strategies for implementing the features of effective feedback include the following: informal feedback; peer feedback; marking guides, rubrics and exemplars; in class dialogue and feedback; feedforward strategies; generic feedback; anticipatory feedback and programmatic approaches. Further details are outlined in recent publication (O'Regan et al. 2016b). In addition, it is suggested that the affordances and benefits of technology-supported feedback may help address the issues and challenges previously outlined in terms of timeliness, variety and consistency (Y1Feedback 2016a). The final phase of the project during which the case studies are being implemented will address the initial aim of the project and will be disseminated through the publication of individual reports. Informed by the current practice review and the synthesis of the literature, seven case studies were selected for implementation and review in AIT. Four academic departments across all three Faculties of Business, Engineering and Science are involved. Technologies have been selected to address concerns about feedback in first year, to promote dialogue, to aid the development of assessment literacies and to enable students develop the knowledge and critical skills required to be successful, self-regulated

Y1 Case Study Title	Technology	Athlone Institute of Technology – Academic Department
Clickers for Dialogic Feedback in the Early Years Care Classroom	Classroom Response System	Department of Humanities
Creating Screencasts of Lab Report Exemplars to Support Feedforward in First Year Dental Nursing.	Screencast Feedforward	Department of Science
Using a Document Camera and Screencasting to Enrich Feedback on Handwritten Lab Books for First Year Mechanical Engineering Students.	Screencast Feedback	Department of Mechanical Engineering
VoiceThread: Enabling dialogic feedback on feedback in First Year Computer Engineering.	Video / Audio Feedback	Department of Computer & Software Engineering
Clickers in the Flipped Lab. Feedback to Enhance Engagement in First Year Science.	Classroom Response System	Department of Science
Student Diary Pro to Enhance Feedback for First Year Social Care students on Placement.	Rubrics, E-portfolios	Department of Humanities
Screencasting to Enhance Feedback on First Year Software Design Students Powerpoint Presentations.	Rubrics, Screencast Feedback	Department of Computer & Software Engineering

Fig. 1 AIT Y1Feedback project case studies. Reproduced with permission of Seamus Ryan, AIT

learners. First-year teaching staff were invited to participate leading to the engagement of seven academic staff. A technology advocate and member of the project team was supported by project funding to work with this new community of practice in the design, implementation and evaluation of the selected case studies. This support included the assistance with design of research questions, the selection of appropriate technologies and building capacity through the provision of workshops and one-to-one support. Therefore, the development of digital and assessment literacies amongst staff was embedded in this approach. Details of the AIT case studies are outlined in Fig. 1. Case studies from all four participating institutes will be reported on in early 2017 with outcomes and additional resources provided at: www.y1feedback.ie.

It is envisaged that the Y1Feedback project will lead to sustained change in practice with staff continuing to develop feedback strategies.

The TEAM Project—Research Problem

In Science and Health programmes, acquiring practical skills in addition to experimental theory is crucial to ensuring student learning and employability. The Institute of Technology (IoT) sector in particular places a major value on producing

graduates who are 'workplace ready' with an emphasis on developing practical skills (TEAM 2016). Recent changes to government policy have led to the publication of the 'Technological Universities Bill' (DES 2015) which will allow for up to ten IoTs to merge as Technological Universities with 'a systematic focus on the preparation of graduates for complex professional roles in a changing technological world' (TU4Dublin 2015). In addition, it is widely recognised that assessment has an important influence on student learning, affecting engagement and motivation, effort and performance (Gibbs and Simpson 2004; Carless et al. 2011; Boud 2014).

Aim

The TEAM for Science and Health Practical Settings project aims to (i) develop a framework for applying the principles of good assessment and feedback to practical assessment, (ii) use digital technologies to enhance practical assessment and (iii) facilitate dialogue amongst stakeholders about what students should learn in practical classes and how assessment can facilitate this (TEAM 2016).

Research Methodology

Commencing in 2016, the first phase of the project involves eliciting feedback from key stakeholders: students, staff and employers using a mixed-methods approach. This element of the project is currently ongoing. Eight hundred students from the participating departments across all four participating institutes will be invited to share their experiences of practical assessment, their attitudes towards it, satisfaction with it, suggestions for enhancement and use of digital technologies in assessment. Data collection methods include an electronic or paper-based survey and the use of focus group interviews with nursing students (TEAM 2016).

Other key stakeholders who will be included in the collection of data will be teaching and support staff in the relevant departments. In addition, employers nominated by each institute will inform work ready practices. Together with an extensive literature review, the analysis of data from stakeholders will inform the development of a number of technology-enhanced assessment approaches to be piloted and evaluated in phase 2 of the project in 2017.

Results

A comprehensive review of literature has been undertaken initially, with a model for the critique of current practice and the design and evaluation of technology-enhanced assessment practices emerging, as indicated in Fig. 2. This

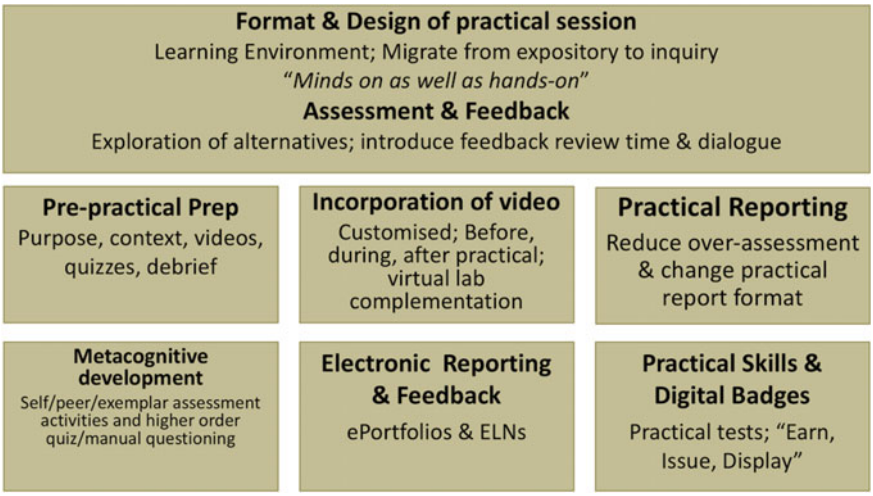


Fig. 2 Baseline analysis: literature review. Reproduced with permission of Dr. Ronan Bree, DKIT

model was designed to capture the key elements to consider when reviewing pedagogy and assessment practices in practical settings and in selecting appropriate classroom technologies for Science and Health. It was used to inform phase 2 of the project. Key themes have emerged for the development of case studies across all four partner institutes. These include the following:

- pre-practical videos combined with online quizzes, video assessments and/or augmented reality which can be used as part of a flipped laboratory,
- digital feedback platforms to provide timely feedback to students,
- rubrics, for performance assessment and the development of self-regulatory skills and
- Electronic Lab Notebooks (ELNs) or ePortfolios, moving to digital reporting in order to meet employer needs in developing this skill.

The next phase of this project will involve the design and implementation of case studies incorporating these themes across the four participating HEIs. Publications and resources will be made available from the project website: http://teamshp.ie/.

Contributions of Both Studies

The Y1Feedback project is already contributing to practice and curriculum enhancements that involves supporting feedback practice through the use of technology. Current project publications will be of interest to those involved in supporting and promoting learning and teaching in HE. This audience is not confined

to a national one but extends to those with an interest in supporting first-year transition and enhancing learning using an evidence-based approach. Similarly, the TEAM project identifies and shares best practice in technology-supported practical assessment. In particular, it is promoting collaborative approaches to investigating assessment practices in Science and Health disciplines which is evolving through the identification of priority themes. This project has the potential for curriculum enhancement beyond the four participating IoTs.

The Irish HE sector has recently endured significant cuts in funding due to the economic downturn (Humpheries 2015; HEA 2016). However, it is evident at institute level that the process of engaging staff in curriculum enhancement projects provides a conduit for the development of their digital literacies underpinned by scholarship. This approach has been identified as a model for twenty-first century higher education (Laurillard 2008; JISC 2014). In addition, the benefits of working collaboratively in shared endeavours are apparent. In particular, the opportunity for educational developers and technology advocates to work with colleagues from different institutes and discipline areas advances the development of sustainable and scalable processes with a focus on capacity building.

A key impact has been the approach adopted of designing-in the engagement by key stakeholders with a framework emerging for how this can be replicated in future projects in order to inform and drive further curriculum enhancements. Both projects are developing a model for using a 'students as partners' approach when engaging in curriculum enhancement initiatives (Healey et al. 2014). This involves the engagement of student ambassadors in both national projects to inform and contribute to all project phases. Student engagement is also an essential element of the current practice review, the development of publications and the implementation and evaluation of case studies. In addition, the involvement of international experts has also been a key feature of both projects. This has occurred formally with project teams inviting experts to provide feedback during each of the project phases. In addition, the biannual progress report presentation, required by the awarding body, NFETL, involves an international panel with the reports subsequently published to inform future planning.

Conclusions

This paper has outlined the context for the design and implementation of two multi-institute national projects that focus on enhancing curriculum design and the development of digital and assessment literacies. The paper explored how both projects are supporting the realisation of national strategic objectives and are used to leverage curriculum enhancement. It is evident that using a collaborative and evidence-based approach both projects are providing a catalyst for change and developing enhanced pedagogy. The deliberate engagement of students as partners and the development of digital and assessment literacies amongst staff and students will assist in developing the digital experience for students in Irish Higher

Education. In doing so, both projects have the potential to make key contributions in enhancing curriculum design and informing the development of pedagogical, digital and assessment practices in a variety of settings.

Acknowledgements The author wishes to acknowledge the contribution of colleagues involved in the national projects. Lisa O'Regan, Maynooth University, leads the Y1Feedback project and the Technology Enhanced Assessment Methods (TEAM) for Science and Health Practical Settings project is led by Dr. Edel Healy, Dundalk Institute of Technology.

References

Boud, D. (2014). Shifting views of assessment from secret teachers' business to sustaining learning. In C. Kreber, C. Anderson, N. Entwhistle, & J. Mac Arthur (Eds.), *Advances and innovations in university feedback*. Edinburgh: Edinburgh University Press.

Carless, D., Salter, D., Yang, M., & Lam, J. (2011). Developing sustainable feedback practices. *Studies in Higher Education, 36*(4), 395–407.

DES. (2011). *National strategy for higher education to 2030*. Dublin: Department of Education and Skills.

DES. (2015). *General scheme technological universities bill*. Dublin: Department of Education and Skills. Retrieved January 22, 2016 from DES: https://www.education.ie/en/The-Education-System/Legislation/General-Scheme-Technological-Universities-Bill-2014.pdf

European Commission. (2013). *Improving the quality of teaching and learning in Europe's higher education institutes.* High Level Group on the Modernisation of Higher Education. Luxembourg: European Commission.

Ferguson, P. (2011). Student perceptions of quality feedback in teacher education. *Assessment and Evaluation in Higher Education, 36,* 51–62.

Gibbs, G., & Simpson, C. (2004). Conditions under which assessment supports students' learning. *Learning and Teaching in Higher Education, 1*(1), 3–31.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77* (1), 81–112.

HEA. (2016). *Financial review of the Institutes of Technology*. Dublin: Higher Education Authority. Retrieved November 2, 2016 from HEA: http://www.hea.ie/sites/default/files/final_iot_financial_review_3_11.pdf

Healey, M., Flint, A., & Harrington, K. (2014). *Engagement through partnership: Students as partners in learning and teaching in higher education.* York: Higher Education Academy. Retrieved June 17, 2016 from HEA: https://www.heacademy.ac.uk/system/files/resources/engagement_through_partnership.pdf

Humpheries, J. (2015). Poor infrastructure 'contributing to slip' in university rankings. *Irish Times*. Dublin, Leinster, Ireland: Irish Times.

ISSE. (2014). *The Irish Survey of Student Engagement (ISSE) results from 2014*. Dublin: ISSE.

JISC. (2014). *Developing digital literacies*. Retrieved January 15, 2015 from JISC: https://www.jisc.ac.uk/full-guide/developing-digital-literacies

Kift, S. (2015). A decade of transition pedagogy: A quantum leap in conceptualising the first year experience. *HERDSA Review of Higher Education, 2,* 51–86.

Laurillard, D. (2008). The teacher as action researcher: Using technology to capture pedagogic reform. *Studies in Higher Education, 33*(2), 139–154.

NFETL. (2015). *Teaching and learning in higher education: A roadmap for enhancement in a digital world.* Retrieved March 20, 2015 from The National Forum for the Enhancement of Teaching and Learning in Higher Education: http://www.teachingandlearning.ie/wp-content/uploads/2015/03/Digital-Roadmap-web.pdf

O'Regan, L., Brown, M., Maguire, M., & Harding, N. (2016a). *Y1 Feedback, presentation to the national forum for the enhancement of teaching and learning*. Dublin: Royal Irish Academy.

O'Regan, L., Harding, N., Brown, M., Maguire, M., McDermott, G., Ryan, S., et al. (2016b). Y1Feedback—The story so far: Progress and reflections from an Irish multi-institutional learning and teaching enhancement project. *AISHE-J, 8*(3). Retrieved October 31, 2016 from AISHE: http://ojs.aishe.org/index.php/aishe-j

TEAM. (2016). Technology Enhanced Assessment Methods (TEAM) in science & health practical settings. In *Edtech 2016.* Dublin: Irish Learning Technology Association.

Tinto, V. (2005). Taking student success seriously: Rethinking the first year of college. In *Ninth Annual Intersession Academic Affairs Forum.* Fullerton: California State University.

TU4Dublin. (2015). *Process and criteria for designation as a Technological University.* Retrieved March 02, 2016 from TU4Dublin: http://www.tu4dublin.ie/contentfiles/publications/Process-and-Criteria-for-Designation-as-a-Technological-University.pdf

Y1Feedback. (2016a). *Feedback in first year: A landscape snapshot across four Irish higher education institutions.* Retrieved March 21, 2016 from Y1Feedback.ie: http://y1feedback.ie/wp-content/uploads/2016/04/ALandscapeSnapshot2016.pdf

Y1Feedback. (2016b). *Technology-enabled feedback in first year: A synthesis of the literature.* Retrieved March 20, 2016 from Y1Feedback.ie: http://y1feedback.ie/wp-content/uploads/2016/04/SynthesisoftheLiterature2016.pdf

Analysis of Course Content Structure and Critical Thinking in Strategic Management

Arifin Angriawan

Abstract Previous research has suggested that content structure is important in promoting critical thinking in strategic management. In this paper, I analyzed various ways to structure course content. I contended that identifying main inquiry questions, and developing models, lecture power points, and checklists improved the effectiveness of the course content in promoting critical thinking. Data collected from 39 graduate students taking strategic management courses that applied the approach supported two of the four hypotheses. The effectiveness of the five questions and lecture power points in promoting critical thinking was supported by the data. Overall, the model explained 68% of the variance of course content in promoting critical thinking in strategic management.

Keywords Course content · Critical thinking · Inquiry questions · Model · Power point

Introduction

Two main goals of the courses that I teach are what strategists do and how they think. Henceforth, I will refer the former as content and the latter as critical thinking in strategic management. This paper is a part of my *teaching research* agenda. The term teaching research is commonly used to refer to the research that specifically aims at improving teaching effectiveness (Nilson 2010). In this study, critical thinking refers to students' ability create strategic decisions based on what they have learned in the class. The decision making requires the students to identify, understand, analyze, and synthesize the strategic situations, and explore and evaluate the potential alternative solutions and their assumptions and implications.

A. Angriawan (✉)
Department of Managerial Studies, Purdue University Northwest, Hammond, IN, USA
e-mail: arifin@pnw.edu

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_23

Previous research has suggested that content structure is important in promoting critical thinking in strategic management. In this paper, I analyzed various ways to structure course content to promote critical thinking in strategic management (Grant 2008). Studying these factors is important (Atwater et al. 2008; McMillan 1987) because it improves our understanding of and the effectiveness of teaching critical thinking in strategic management. Furthermore, strategic management courses are the capstone courses for many majors in business schools. In general, critical thinking is a very important goal of post-secondary education. This skill allows students to reason, judge (McMillan 1987), and become good decision makers.

Research Problem

In this paper, I identified and tested several content structure practices that improved the effectiveness of course content in promoting critical thinking in strategic management: main inquiry questions, models, power points, and checklists. The content of strategic management courses is rich and complex. In many universities, they are the required and capstone courses offered for seniors or the final-semester MBA students. Thus, the course content needs to be structured in a certain way. I identified and shared with the students the main inquiry questions in the course. These questions bound and provided a hierarchical structure of the course content. These questions gave students an overall tool to organize and general direction of learning. I developed several models to further explicate the inquiry questions and to show how various concepts in the questions are related. Power points provide the details of the questions and models. The power points are also structured in a certain way to promote learning. Finally, checklists are developed to summarize various concepts and their relationships discussed in the course. (Please refer to the research model in Fig. 1.)

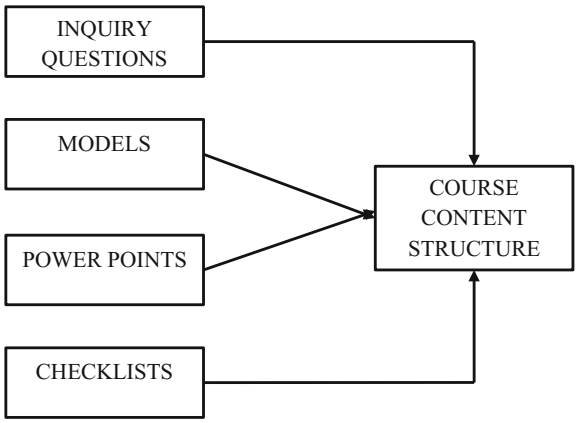


Fig. 1 Research model

Objectives of the Study

Consistent with the research problem, I tested four hypotheses related to main inquiry questions, models, power points, and checklists.

There are five inquiry questions in the graduate strategic management course that I teach. The inquiry questions are as follows: (1) What are our guiding principles? (2) Where do we play? (3) How can we win? (4) What are the required resources and capabilities? and (5) When will we change? Better grasp of the course content will help students make better strategic decisions. The inquiry questions will allow students to know the various knowledge domains of strategic management. Students will then utilize the knowledge to identify, analyze, synthesize, evaluate, and make recommendations. I contended that:

> H1: Inquiry questions positively associate with the effectiveness of course content in promoting critical thinking in strategic management.

Research results have indicated that structuring knowledge through modeling is essential in human learning (Bligh 1998; Nilson 2010). More specifically, Grant (2008) has suggested the use of models in teaching strategic management. Consistent with previous research findings, I contended that:

> H2: Models positively associate with the effectiveness of course content in promoting critical thinking in strategic management.

The inquiry questions and models are further explained in the lecture power points. The power points provide details of information, integrate lectures, and explain relationships of the course content. In each set of lecture power points, I developed slides that explained how the current chapter relates to or expand the previous sets of lectures. It also has slides that summarized all concepts and relationships taught so far in the course. The structure of the power points enhanced student learning and their ability to make strategic decisions. Based on the discussion above, I contended that power point structure facilitated the development of critical thinking in strategic management. I hypothesized that:

> H3: The power point slides positively associate with the effectiveness of course content in promoting critical thinking in strategic management.

I used several learning checklists for each course that I teach. More than cataloguing the concepts learned, some of the checklists that I have developed show the concepts along with their definitions and examples. Some of the checklists illustrated the concepts and relationships as applied in real-life firms. I believed that checklists improved both students' comprehension and integration of the content. This comprehension and integration of content will improve students' critical thinking. Based on the discussion, I hypothesized that:

> H4: The checklists positively associate with the effectiveness of course content in promoting critical thinking in strategic management.

Research Methodology

Data were collected from 39 graduate students taking a strategic management course in spring 2015 and 2016. The course applied the approach described. Surveys were distributed to the students in the class at the end of the semester. The students were asked to fill the surveys using Likert scale of 1–5, where 5 is strongly agree, 3 is neutral, and 1 is strongly disagree. The variables in the study were measured by the following items: (1) Overall, the content of the course improves my critical thinking ability in strategic management; (2) overall, the inquiry questions of the competitive strategy improves my critical thinking skill in strategic management; (3) overall, the competitive strategy model improves my critical thinking skill in strategic management; (4) overall, the lecture power points improve my critical thinking skill in strategic management; and (5) overall, the competitive strategy checklist improves my critical thinking skill in strategic management. I used multiple regression technique to analyze the data.

Results and Discussions

The model explained 68% of variance of overall course content in promoting critical thinking in strategic management. (Please refer to Tables 1 and 2.) Table 1 shows the descriptive statistics. In Table 2, I regressed inquiry questions, models, power point slides, and checklists on content. Table 2 shows that inquiry questions and power points are significant and positive predictors of critical thinking in strategic management. Thus, the data support both hypotheses 1 and 3. Two out of the four hypotheses were supported. The effectiveness of the five inquiry questions in promoting critical thinking was supported by the data. The beta is 0.368 (t = 2.57). Similarly, the power points constructed also significantly predicted the overall course content in promoting critical thinking. The beta for power point is 0.529 (t = 3.7). Both hypotheses are significant at 0.01 level.

I believe that inquiry questions bound, provided a structure, and gave students an overall direction of learning. This practice enhanced and promoted the effectiveness of teaching and learning critical thinking. More than the general inquiry questions,

Table 1 Means, standard deviations, and correlations (n = 39)

Variable	Mean	SD	1	2	3	4	5
1. Content	4.62	0.59	1				
2. Models	4.40	0.71	0.60	1			
3. Checklists	4.49	0.64	0.61	0.70	1		
4. Inquiry questions	4.56	0.64	0.70	0.67	0.65	1	
5. Power points	4.50	0.67	0.77	0.66	0.66	0.61	1

Table 2 Standardized regression coefficients predicting critical thinking

	B	SE	*β*
Models	−0.01	0.06	−0.02
Checklists	0.03	0.14	0.04
Inquiry questions	0.34	0.13	0.37[a]
Power points	0.46	0.13	0.53[a]
R^2		0.68	
F		17.8[a]	

[a]Significant at 0.01 level

power points provided details, summarized, integrated, and explained the questions and their relationships. I also used relevant examples in the slides in order to promote learning (Svinicki 2004). Collectively, the inquiry questions and power points provided students with the direction and information as well as explanation and integration of the course content that promoted their critical thinking.

Researchers have found that our brains store, process, and retrieve knowledge as coherent and interconnected parts, not as a collection of information (Bransford et al. 1999; Svinicki 2004). Thus, developing models is an essential human learning mechanism (Weick 1979). Without such structuring, students will fail to understand and recall what they have learned.

However, data collected did not support the hypothesis. I believe that the data were simply suggesting that the practice of teaching using models in the two classes was not effective. It might have indicated that teaching critical thinking using model requires skill and time.

Contributions of the Study

The results suggested the importance of using main inquiry questions and power points in promoting critical thinking. This study extended the literature on teaching critical thinking in strategic management. It also provided some practical implications. First, this study provided empirical support for adopting the practice of developing main inquiry questions and power point slides.

One of the goals of this study is to learn and improve my teaching effectiveness. The data suggested that I was not effective enough in using models and checklists in promoting teaching and learning critical thinking in strategic management.

Conclusions

In this paper, I analyzed various ways to structure course content. I contended that identifying main inquiry questions, and developing models, lecture power points, and checklists improved the effectiveness of the course content in promoting critical

thinking. The hypotheses related to inquiry questions and power point slides were supported, while hypotheses related to models and checklists were not supported.

Limitation and Future Research

Given the importance and complexity of critical thinking, researchers in the future might want to use objective measures. The measures used in this study are subjective perception of the students taking the surveys. Furthermore, critical thinking relates to various cognitive skills. Bloom's (1956) taxonomy comprises six levels of cognitive development: knowledge, comprehension, application, analysis, synthesis, and evaluation. Researchers in the future might want to study how the various ways of structuring the content can impact these various cognitive skills. For example, some practices such as modelling and five inquiry questions might have more impacts on students' ability to synthesize. Researchers might also want to examine the model of the present study for other courses.

Given that this study used data collected from graduate- and final-semester (senior and second-year graduate) students, they might have already developed better ability to think critically. This might have impacted on the results of the study. Thus, examining the model using the undergraduate students might further validate some results of this study.

References

Atwater, J. B., Kannan, V. R., & Stephens, A. A. (2008). Cultivating systemic thinking in the next generation of business leaders. *Academy of Management Learning & Education, 7*(1), 9–25.

Bligh, D. A. (1998). *What's the use of lectures?* Intellect books.

Bloom, B. S. (1956). *Taxonomy of educational objectives. Cognitive domain* (Vol. 1). New York: McKay.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (1999). *How people learn: Brain, mind, experience, and school*. Washington, DC, US: National Academy Press.

Grant, R. M. (2008). Why strategy teaching should be theory based. *Journal of Management Inquiry, 17*(4), 276–281.

McMillan, J. (1987). Enhancing college students' critical thinking: A review of studies. *Research in Higher Education, 26*(1), 3–29.

Nilson, L. B. (2010). *Teaching at its best: A research-based resource for college instructors*. Wiley.

Svinicki, M. D. (2004). *Learning and motivation in the postsecondary classroom*. Anker Publishing Company.

Weick, K. E. (1979). *The social psychology of organizing*. McGraw-Hill.

Micro-learning—Adopting Digital Pedagogies to Facilitate Technology-Enhanced Teaching and Learning for CPD

Darragh Coakley, Roisin Garvey and Íde O'Neill

Abstract In the midst of growing transformation, many within higher education cling resolutely to more familiar structures and delivery models, having little but a cursory regard to the events which are unfolding. This paper seeks to highlight the various potencies which are hastening fundamental change within higher education, particularly with regard to the provision of continuing professional development. It encourages the adaptation of appropriate pedagogies designed specifically to facilitate technology-enhanced teaching and learning methodologies, reflecting the cognitive and collaborative learning modes of current and future learners. Ultimately, the evidential content suggests the necessity to embrace educational technological affordances in order to support the evolution of higher education.

Keywords Technology-enhanced learning · e-Learning · Micro-learning

Introduction

As technology and its affordances continue to evolve, new skill sets are required in order to maintain and ameliorate growth rates within the economy. Rapid technological changes dictate the demands of the knowledge economy, and there is a constant need to maintain skills at the optimum level. While developments in technology offer boundless opportunities to enhance and increase access to educational content, this can only be achieved successfully within the context of appropriate pedagogical design.

D. Coakley (✉) · R. Garvey · Í. O'Neill
Department of Technology Enhanced Learning,
Cork Institute of Technology, Bishopstown, Cork, Ireland
e-mail: darragh.coakley@cit.ie

R. Garvey
e-mail: roisin.garvey@cit.ie

Í. O'Neill
e-mail: ideoneill01@gmail.com

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_24

Technology-Enhanced Learning in Ireland

A study from the National Forum for the Enhancement of Teaching and Learning in Higher Education (NFETL 2014b) has identified the genuine desire amongst Irish educators to effectively utilise technologies to enhance and support their teaching and learning practice, both amongst the educators themselves as well as on the part of the universities, schools and institutions in which they work. Indeed, the report notes that despite some concerns related to best use of technology in teaching and learning, there is "a widespread commitment to utilise its potential to support and engage students and their learning". In addition, in a survey conducted to determine the use of technology for teaching and learning in higher education, 79% of the "enthusiastic users of TEL" acknowledged receiving encouragement from their institute to use technology in their practice (NFETL 2014a).

Despite these assertions, however, a number of barriers and challenges still limit the effective use of technology for teaching and learning. Results from the NFETL (2014a) nationwide survey distinguished a wide range of challenges which Irish educators are required to deal with when attempting to effectively utilise a technology-enhanced learning (TEL)-based approach. Notably, the report identifies that the main barriers are a "lack of training and insufficient time to engage in TEL [and lack of] awareness regarding the potential of TEL and confidence in the availability of technical support". Laurillard (2002) emphasises that "technology can do only so much. On its own, it cannot offer academics what they need to adapt their teaching to the needs of the digital age". The author also notes the significant time pressures burdening academics in terms of related research requirements and increasing student numbers and class sizes, which have often resulted in academics being unable or unwilling "to go beyond the traditional forms of academic teaching". In an age when upskilling in the use of evolving technologies is crucial for economic growth, more continuing professional development (CPD) and lifelong learning opportunities can positively impact on both educators and students.

What emerges from all of the above is a situation whereby the benefits of TEL are recognised and desired, both by individual educators and institutions as a whole, but where fundamental factors in the provision of information and effective training on TEL are under-addressed. In this situation, individuals remain unaware of the benefits of TEL and remain unable to effectively utilise technologies and systems for the purposes of teaching and learning.

The Need for a Pedagogical Framework

In its report to the European Commission (2014), this High Level Group observes that "new technologies and associated pedagogies require a very different skill set from more conventional teaching"; the contributors also point out that "academic

staff are not all technology experts and in many cases, they have not received any form of pedagogical training at all". Similarly, Conole et al. (2004) stated that "practitioners are still unclear about how to use technology appropriately, and its application is often based on common sense rather than being theoretically informed by pedagogical theory".

While most academics would apply familiar methodologies in the preparation and delivery of their subject-content, the utilisation of new technologies affords new approaches to teaching and learning which are complemented by knowledge of learning theory and pedagogy. Conole and Dyke (2004) conclude that "there has been a realisation that the development of content alone does not lead to more effective learning, and that there is a need to structure and foster learning environments to enable communities to develop". Similarly, Harris et al. (2009) note that because the "continual evolution of technology, pedagogy, and content often brings new learning activity types to light… [there are] new ways of representing content, and new ways of helping different students learn it" made possible through the combined efforts of "content experts, educational technology developers, educational researchers, and pedagogical practitioners".

Micro-learning

In keeping with these difficulties encountered by professional educators, Buchem and Hamelmann (2010) note that traditional classroom-based training and longer-term Web (frequently LMS-based) training can often be oppressive and unwieldy, and the time and attention demands on the working professionals who comprise the learners in these scenarios can be considerable. As a solution to this, micro-learning described variously as "measurable", "short", "simple", "nuggets" of information (Hug 2005, pp. 4–5) that "concentrates on structuring and syndication of information" (Kahnwald and Köhler 2006, p. 158), can provide an alternative to more rigid forms of CPD learning. Micro-learning can facilitate an approach more suitable to fast-paced and multitask-orientated patterns of working (and consequently, learning) as learning can be completed using small units of content engaged with over a number of small steps.

Hug and Friesen (2007) note that micro-learning can "be utilised with a range of pedagogies, including, selective, pragmatist, conceptionalist, constructivist, connectivist or behaviourist learning or action-, task-, exercise, goal- or problem-orientated learning". This flexible nature facilitates its benefits for CPD. Robes (2009) also identifies that micro-learning can even potentially be used to compliment, rather than replace, more formal, time-consuming means of learning, further indicating the flexibility of the approach.

The "TEL Tools" Project

The "TEL Tools" project aims to meet the challenge facing TEL training for educators by developing teaching and learning resources that will equip instructors with the tools and knowledge required to utilise tools and resources for TEL in an effective and practical manner through a micro-learning-based approach. The primary output of the project is an online platform (available at http://telu.me/), which has a specific focus on assisting instructors in identifying, selecting and utilising technologies that can support and enhance their teaching and learning practices and, in doing so, matching the technological requirements with the pedagogical requirements.

"Micro-lessons"

Learning content in the *telu.me* platform is based entirely around the provision of micro-learning objects, referred to in the platform as "micro-lessons". Each and every micro-lesson is designed to provide practical information to the viewer on how to effectively support or enhance a specific teaching/learning approach using an appropriate digital tool or technology.

The structure and information contained in each micro-lesson is designed as a series of questions, explaining the following:

1. "What is this tool/technology?"
2. "Why should I use this tool/technology for teaching and learning?"
3. "How can I use this tool/technology for teaching and learning?"
4. "Where can I get this tool/ technology?"
5. "How do I get started with using this tool/technology for teaching and learning?"

In addition to the above, each micro-lesson also provides a range of resources to help assist the viewer in using the given tool/technology for the specific teaching or learning activity.

The short duration and specifically focused content of each micro-lesson aid in the "digestion" of the learning content by the user, providing them with specific information related to what the tool or technology is, and how it can be put to use for teaching and learning purposes. The design for the platform's micro-lessons ensures that the application of the tool or technology in a specific teaching or learning activity is always the focus. This also serves to outline to the user the potential offered by specific tools and technologies and how they may be used for educational purposes. At no time is the user "in the dark" as to how to leverage a given technology to their educational practice.

All of this is designed to address the barriers to TEL training faced by many educators—allowing them to access and acquire the learning information quickly

and providing them with the relevant information in an understandable fashion with a practical approach to implementation and application. Furthermore, the provision of additional resources in each lesson provides the educator with additional technical guidelines which they can use to extend their knowledge beyond lesson content.

"Micro-courses"

Learning content in the platform is organised in a logical taxonomy. In addition to the use of micro-lessons focused on a specific tool or technology used to support or enhance teaching and learning practice, the platform can also facilitate the application of larger learning outcomes by offering combinations of micro-lessons, titled "micro-courses". These are composed of multiple relevant micro-lessons. If a single micro-lesson seeks to educate a user on, for instance, how to use collaborative writing software to facilitate student collaboration, a micro-course may aim to educate the user on how to facilitate students in mind-mapping an idea for a group report (using online mind-mapping software), then organising themselves (using online time management tools) and finally collaboratively writing a report (using collaborative writing software).

The taxonomy is further exploited by presenting "paths" to learners. These paths are composed of very specifically curated content—multiple micro-lessons and micro-courses—and are designed to address even larger learning outcomes than micro-courses (e.g. a full overview of how one can use multiple communication tools or technologies within and outside of the classroom). Paths can therefore be developed and curated in order to address the needs of very specific individual requirements.

This use of multiple types of learning objects, each facilitating a different "level" of learning outcome (related to TEL), provides a great degree of flexibility to users of the platform, allowing them to undertake quick, focused training related to the use of a specific tool or technology for a specific learning activity or alternatively, allowing them to undertake more extensive training to allow them to integrate numerous tools or technologies into their practice to implement larger changes.

Conclusions

As outlined earlier, the difficulties facing educators seeking to engage in TEL training are not insubstantial. Familiar structures and delivery models have thus far proven ineffective, and dramatic changes would appear to be required in order to effectively facilitate training. Although educators may rely on the familiar methods of education which they themselves utilise to facilitate learning, there is significant weight to the suggestion that the training of educators in TEL would be best served

by effective practices from the area of CPD and lifelong learning. To this end, the strategy of micro-learning outlined above offers an opportunity to educators to engage in unobtrusive yet effective work-based learning, due to the approach's inherently flexible and granular nature—facilitating a number of different pathways for learners. The *telu.me* open online platform seeks to utilise this learning strategy in order to provide educators with training on effective TEL practice and tools, while ensuring that the pedagogical implications of the practice in question remain at the forefront of the learning. Despite this, however, the role of the broader educational institution cannot be underestimated in terms of its connection in implementing, enabling and encouraging support for TEL training and approaches. As with effective CPD practice, staff need to be given time and encouragement, not just to undertake training, but to determine for themselves how this training can be used to benefit their own teaching practice.

References

Buchem, I., & Hamelmann, H. (2010). Microlearning: A strategy for ongoing professional development. *eLearning Papers. Consultado el, 1,* 1542–1887.

Conole, G., & Dyke, M. (2004). What are the affordances of information and communication technologies? *Association for Learning Technology Journal, 12*(2), 113–124.

Conole, G., Dyke, M., Oliver, M., & Seale, J. (2004). Mapping pedagogy and tools for effective learning design. *Computers & Education, 43*(1), 17–33.

European Union, European Commission High Level Group on the Modernisation of Higher Education. (2014). *Report to the European Commission on: New modes of learning and teaching in higher education*. Retrieved from http://ec.europa.eu/education/library/reports/modernisation-universities_en.pdf

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education, 41*(4), 393–416.

Hug, T. (2005, May 6–8). *Micro learning and narration: Exploring possibilities of utilization of narrations and storytelling for the designing of "micro units" and didactical micro-learning arrangements*. Paper presented at *Fourth Media in Transition Conference:* MiT4: The Work of Stories, MIT, Cambridge (MA), USA

Hug, T., & Friesen, N. (2007). Outline of a microlearning agenda. *Didactics of Microlearning. Concepts, Discourses and Examples*, 15–31

Kahnwald, N., & Köhler, T. (2006). Microlearning in virtual communities of practice? An explorative analysis of changing information behaviour. In *Proceedings of Microlearning Conference* (pp. 157–172).

Laurillard, D. (2002). Rethinking teaching for the knowledge society. *EDUCAUSE Review, 37*(1), 16–24.

NFETL. (2014a). *National survey on the use of technology to enhance teaching and learning in higher education.* Retrieved from http://www.teachingandlearning.ie

NFETL. (2014b). *Report from principles and first insights from sectoral consultations on building digital capacity in Irish higher education*. Retrieved from http://www.teachingandlearning.ie

Robes, J. (2009). *Microlearning und Microtraining: Flexible Kurzformate in der Weiterbildung. Handbuch E-Learning. Expertenwissen aus Wissenschaft und Praxis–Strategien, Instrumente, Fallstudien*. Köln: Fachverlag Deutscher Wirtschaftsdienst. Erg.-Lfg. Oktober 2009.

Governance Practices and Disclosure by Not-for-Profit Organizations: Effect on the Individual Donating Decision

Amy C.M. Yeo, C. Yun Chong and Steve Carter

Abstract This study aims to (1) examine how individual donating decision could be affected by demographic factors and (2) determine perception of public towards governance disclosure practiced by non-profit organizations in Malaysia. This study uses positivist approach and survey instrument to obtain data that generated subsequent statistical analyses. Using snowballing and simple random sampling, this study manages to secure a sample of 255 respondents. SPSS ANOVA, product–moment correlation and multiple regressions are used to generate results for the testable propositions. The results for Pearson moment correlation of governance practices and disclosure are statistically significant ($p < 0.01$). Gender is the only influencer that revealed differences between groups in respect of donating decision. The findings also showed that information disclosures about governance ($\beta = 0.288$, $p < 0.001$), background ($\beta = 0.199$, $p < 0.003$) and performance ($\beta = 0.210$, $p < 0.000$ with the exception of finance ($\beta = 0.078, p > 0.001$) are strong predictors of individual donating decision. The insight of this study offers senior officials and decision-makers of not-for-profits and charity organizations the essence of governance practices disclosure, revealing sufficient background and performance information for potential donors to make informed decisions. In spite of the popularity of the governance research over the years, this study is one of the novel investigations using not-for-profit organizations in relation to the proclivity for individual giving intention, the results of which could be applicable to emerging markets.

A.C.M. Yeo (✉)
Faculty of Accountancy Finance and Business,
Tunku Abdul Rahman College, Kuala Lumpur, Malaysia
e-mail: yeocm@acd.tarc.edu.my

C. Yun Chong
Ministry of Science Technology and Innovation (MOSTI),
Putrajaya, Malaysia
e-mail: cc.chaiyun@gmail.com

S. Carter
Edinburgh Business School, Herriot Watt University, Edinburgh, UK
e-mail: sc@ebs.hw.ac.uk

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_25

Keywords Governance practices · Non-profit organizations · Individual donating decision · Malaysia

Introduction

Non-profit organizations sometimes referred to as the "third sector" are gaining more prominence in recent years in the fields of social well-being provision, education, community, international relations, environment, culture, health, arts and so forth (Noorbijan et al. 2014). Definitions of non-profit organization abound, for instance, Letts et al. (1999) define non-profit organization as organization that often undertakes certain form of charity work and public benefits and most organizations rely on raised funding from public, corporate or private philanthropy and government grant. Over the last decade, media attention to non-profit organization sector scandals has increased, mainly centred on regulation, self-regulation and transparency. One of which involved conviction of William Aramony, president of the United Way of America who was found guilty for defrauding the organization of more than $1 million (McFadden 2011) and Kids Wish Network (United States) was found diverted fund money to enrich charity's operator and founder's company (Hundley and Taggart 2013). However, these scandals often were not as highly publicized as other for-profit corporations because there were no shareholders complaining about their loss.

There are 57,570 registered organizations with the ROS as of March 2016 (Malaysia's Open Data Portal) and 2040 CLBG registered by the CCM as of June 2016 (Companies Commission of Malaysia Portal). The trend is increasing year-on-year since 2013 until 2015 which is 8034, 8259 and 10,307, respectively (Registry of Society Portal). The rapid increase in registered non-profit organizations has made the accountability issue of the third sector a major concern of the donors (Tamilchelvi and Ramachandran 2015). In addition, there is no specific accounting standard for non-profit organizations (except CLBG) to follow though, instead, they are encouraged to comply with the International Financial Reporting Standards adopted by the Malaysian Financial Reporting Standards (Arshad et al. 2013). It is also not mandatory to have a code of corporate governance for non-profit organizations to support their fiduciary work towards the best practices in governance. Thus, overall disclosure and reporting systems of non-profit organizations in Malaysia only comply with minimum regulatory requirements. On the contrary, the non-profit sector in developed countries is getting better structured and properly regulated with codes of corporate governance well laid out (Othman and Ali 2014; Tamilchelvi and Ramachandran 2015).

Despite the above contention, CCM and ROS have taken few initiatives and measures to promote transparency, accountability and integrity of non-profit organizations. In the context of non-profit organizations and the concern for the individual donating decision, we set out our objectives of this study as follows: (a) understand the perception of the public towards governance disclosure practiced

by non-profit organizations in Malaysia and its effect on their donating decision and (b) examine how demographic factors would affect the individual donating decision.

Hence, we also formulated our research questions based on the associated hypotheses in the study:

1. How much information disclosure does the public expect from a non-profit organization?
2. What criteria do the public use when selecting which non-profit organization to support?
3. How do demographic factors influence the individual donating decision?

Objectives of the Study

The objectives of this study are to (1) examine how demographic factors affect individual donating decision and (2) understand perception of public towards governance disclosure practiced by non-profit organizations in Malaysia which would affect their donating decision.

Literature Reviews

Background Information Disclosure

In deciding to donate to a particular non-profit organization, a person would have to be equipped with general knowledge and familiarity with the charities as these constitute significant determinants towards his/her perception of the organization. This reinforced the proposition that charities should develop communicating strategies through public relations, image building and reputation management so as to improve potential donors' perceptions of their activities (Bennett and Savani 2002). This finding was further corroborated by Teah et al. (2014) who argued that a positive image of charitable organizations did encourage donating behaviour. Zainon et al. (2011) revealed that background information such as name, nature of services, validity of registered address and the list of office bearers' name is important for a stakeholder, especially institutional donors. This information is not only required by the Registry of Society Act 1966 (Act 33 a5), but also serves as a basic contact and range of services offered by the organization prior to stakeholder decision. Additionally, Bennett and Savani (2002) also pointed out that relevant information could significantly improve a person's knowledge and familiarity towards charitable organizations. Possession of a high degree of knowledge and familiarization does influence a person's tendency to offering.

Financial Information Disclosure

Saxton et al. (2011) posited that there are three main ways for donors to access information about non-profit organizations: first, the organization's annual report uploaded onto the non-profit's website or on request; second, through word of mouth including direct contact with the organization's person-in charge or clients; and third, through the organization's fund-raising activities. The act of publishing an annual report by NPOs shows that they care about their stakeholders by sharing financial performance and organizational information (Simaens and Koster 2013). Research carried out by Van Der Heijden (2013) also revealed that donors were increasingly evaluating accounting information of charities prior to the donating decision. The research focused on the program-spending ratios of charities which eventually affect individual donation adjustment. Typically, non-profit organizations did not adhere to financial reporting practice compared to profit organizations due to their loose regulatory requirements. However, Othman and Ali (2014) did advocate that better controlled finances of non-profit organizations would eventually boost their reputation and trustworthiness.

Performance Information Disclosure

Aside from financial factors, other essential non-financial factors were also very useful for donors such as the achievement of the charity organization (Johns 2004). Donors often face a dilemma that they cannot easily observe how monies donated are being spent. Research has shown that there was a decline in public trust towards non-profit sectors across a range of settings (Salamon 2002). Donors tend to become more concerned about the corruption issue in the non-profit sector, and thus, these organizations have to secure and sustain public trust and support for their viable existence (AbouAssi 2015). It is, therefore, clear that people are now requesting more information pertaining to performance of NPOs before they donate. There are four major reasons to explain this trend. First, the bad performance of the stock market reduced the amount of donor capital; second, the emergence of venture philanthropy that focused on performance measurement; third, more executives in the profit sector are moving into the non-profit sectors; and fourth, government attention towards the non-profit sector (Jos and Ton 2008). Buchheit and Parsons (2006) observed that fund-raising activities containing service efforts and accomplishments disclosures were more informative and significantly increased the quality perception of non-profit organization and the percentage of potential donors. Bekkers and Wiepking (2011) also identified that one of the most important forces that motivate charitable giving was information shared through performance disclosure. On the contrary, Haski-Leventhal and Foot (2016) found that there was no significant relationship between donation and

disclosures including performance information disclosure. Interestingly, they found that a greater spending in the organization's marketing and fund-raising would attract more household donations.

Governance Information Disclosure

Governance structure and practices in non-profit organizations are important to protect the integrity and sustainability of the organizations (Connolly and Hyndman 2013). There are two factors to be considered under governance structures: board composition and board size. Board composition consisting of internal management and external audiences (beneficiaries or major donors) has shown to play a significant role in monitoring the efficiency of an NPO in disbursing donations to serve its philanthropic purposes (Hyndman and McDonnell 2009). Conversely, other opponents contended that board size has not been shown to be significant in influencing donating decision by donors (Hyndman and McDonnell 2009; Haski-Leventhal and Foot 2016). However, Gregory et al. (2016) found that a larger board size would encourage better governance with more disclosure decision to enhance the organization's public accountability. Other governance information including a calendar of events and activities, community services, internal audit committee, members experience and the like were considered important information items to donors (Zainon et al. 2011).

Demographic Influences on Giving Behaviour

Research evidence suggested that gender is an important variable in measuring charitable giving behaviour (Dvorak and Toubman 2013). For instance, men are more individually oriented and thus less likely to make a donation, while women are more socially oriented and therefore more willing to contribute to charitable causes (Eckel and Grossman 2000; Dvorak and Toubman 2013). Likewise, Schnepf and Piper (2007) found that women are more likely to make charitable donations, while men are more generous in terms of the amount given. However, some research showed insignificant results in charitable giving behaviour between men and women (Kasri 2013; Lwin et al. 2013).

Other demographic characteristics might also affect donor behaviour. Bekkers and Wiepking (2011) through their study showed that individual age and giving behaviour are positively related. Older American generations (born before 1945) tend to contribute bigger gifts compared to younger donors ranging from Baby Boomers (born 1946–1964) to Generation X (1965–1980) and Y (1981–1991) (Deborah 2013; Fritz 2014; Yao 2015). In Australia, older individuals aged over

46 years old were more likely to donate than younger generations (Lwin et al. 2013). In Brunei, the donating decision has no relationship with individual age (Lwin et al. 2013).

Based on the above literatures, the following hypotheses and theoretical framework (see Fig. 1) are developed:

H1(a) There is a significant relationship between background information disclosure and the individual donating decision
H1(b) The background information disclosure will contribute to the prediction of the individual donating decision
H2(a) There is a significant relationship between financial information disclosure and the individual donating decision
H2(b) The financial information disclosure will contribute to the prediction of the individual donating decision
H3(a) There is a significant relationship between performance information disclosure and the individual donating decision
H3(b) The performance information disclosure will contribute to the prediction of the individual donating decision
H4(a) There is a significant relationship between governance information disclosure and the individual donating decision
H4(b) The governance information will contribute to the prediction of the individual donating decision
H5(a) Demographic factors (gender, age, income, educational attainment and religion) have a significant effect on individual donations.

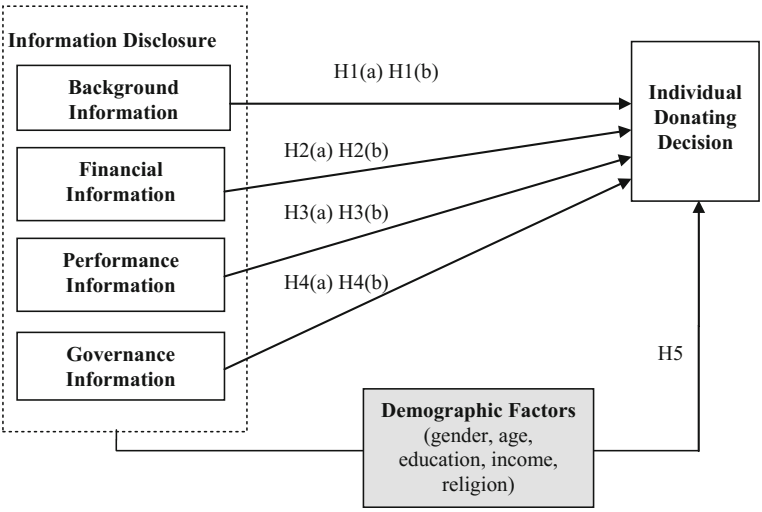


Fig. 1 Research framework

Research Methods

Research Design and Questionnaire

This research was conducted using a positivist cross-sectional method. Statistical tools such as descriptive statistics and product–moment correlation were used to investigate the characteristics of background, financial, performance and governance information that influence the individual donating decision. The descriptive statistics were used to generate information regarding the characteristics of respondents such as gender, level of education, age, monthly income and religion. To determine the predictive power of the various influencers towards the donating decision, multiple regressions were employed. A questionnaire was adapted from relevant prior studies by first part examined past donations which contained information such as the respondents' past donation experience in terms of total amount donated annually and the type of organization they donated to the most. Part II contained 19 questions aimed at investigating the influence of different information disclosures on their donating decision to a non-profit organization. Five-point Likert scales (1 = strongly disagree, 2 = disagree, 3 = neither, 4 = agree and 5 = strongly agree) were employed in scaling responses of the survey. Part IV was related to the respondent demographic profile covering gender, level of education, age, monthly income and religion (Jos and Ton 2008; Robin and Sharon 2010; Zainon et al. 2011; Abd et al. 2015; Haski-Leventhal and Foot 2016).

The instrument was pre-tested with a group of 25 people who were randomly selected to do a trial run of the questionnaire. All respondents took less than 10 min to complete, and only two people commented that all questions in Part IV (personal information) would likely to cause some confusion. The questionnaire was then fine-tuned before distributed online (Google form wide email) and offline (hard copy) to collect the needed data within a specific duration of time. The sampling procedure of using an online mode (Google form) meant easy access through computers, tablets and smart phone. The Google form allowed the researchers to gather information and generate an online spreadsheet. With this, we then transformed data from the spreadsheet into the SPSS statistical software (version 20). Above all, we also endeavoured to elicit a good response by surveying during lunch time, off office hours and weekends. Nonetheless, care was taken to minimize possible risks as some of the questionnaires collected were unusable due to incompleteness or human error compared to the online survey in which essential items had been preset.

Sample and Data Collection

Targeted respondent groups were the public donors mainly residing around the area of Selangor, Kuala Lumpur and Putrajaya, Malaysia. These three areas show the highest urbanization rate, i.e. Kuala Lumpur and Putrajaya with 100% level of

urbanization and Selangor recorded 91.4%, respectively (Department of Statistics Malaysia 2011). Simple random sampling and snowball sampling were used in this study to reach respondents who would respond to the survey. In this study, snowball sampling was chosen because the respondents may have close social networks that could potentially contribute to the study. Finally, a total of 265 questionnaires were distributed to the public via online or hand distributed in hardcopy. From the returned questionnaires, 255 were completed and usable constituting 96% response rate. According to Roscoe (1975), sample sizes larger than 30 and less than 500 are appropriate for most studies (Woodside et al. 2009; Sekaran and Bougie 2010).

Results and Discussions

The main results of this study can be summarized as follows:

- Product–moment correlations for all the constructs under study are statistically significant with p value less than 0.001.
- Standard multiple regression results show that all beta values for governance, background and performance information disclosure are also bearing $p < 0.01$
- t-test result reveals that there is a difference between male and female in terms of donating decision.
- ANOVA results indicated that there is no difference in donating decision with regard to demographic factors such as education level, age, monthly income and religion. This test was not significant, and hence, the testable proposition was not accepted.

To answer the first and second research questions, correlation and standard multiple regression analysis were used to verify the hypothesis depicted. There was a significant relationship between background information disclosures and individual donating decision ($p < 0.01$). This finding also showed that background information was one of the predictors of individual donating decision ($p < 0.05$). The results ran parallel to the research found by Bennett and Savani (2003), Zainon et al. (2014), and Abd et al. (2015). Invariably, most respondents concerned the nature of services and information availability provided by non-profit organizations before donating decision. However, validity of registered address of non-profit organizations exerted less meaning towards basic information required by donors. Registered address was not an important consideration in donating decision.

In addition, there was significant relationship between financial information disclosures and individual donating decision ($p < 0.01$). However, financial information did not contribute to the prediction of donating decision ($p > 0.05$). The result of this analysis supported the research of Connolly and Hyndman (2013) and Haski-Leventhal and Foot (2016) that individual donors did not incorporate financial information into their donating decision. It also suggested that respondents were less likely to be sceptical of how the non-profit organizations manage its

financial nuances. As opposed to institutional donors, individual donors were less accessible to financial statement or annual reports and their lack of financial knowledge (Connolly and Hyndman 2013). The view of Othman and Ali (2014) also provided evidence that tightening financial reporting practice could let donors have a better picture of donations which eventually encourage trust and confidence towards the organizations. The mixed results of the past clearly denote that financial information disclosure might not be a good predictor of the donating decision.

Performance information disclosure exerted significant relationship with individual donating decision ($p < 0.01$). At the same time, performance information disclosure was found to be one of the predictors influencing individual donating decision ($p < 0.05$). This finding was in alignment with previous studies emphasizing the importance of performance information disclosure on donation decision (Buchheit and Parsons 2006; Jos and Ton 2008; Bekkers and Wiepking 2010). From the results, verified certification of non-profit organization gave the most impact on individual donating decision followed by the way of reporting activity, participation in special projects as well as details of programmes and services. It was learned that many syndicate corporations nowadays misuse the nature of non-profit organization to seek profit through fund-raising activities (Yeo and Linette 2013).

Our analyses also revealed that there was significant relationship between governance information disclosures and individual donating decision ($p < 0.01$). Governance information was also found to contribute to the prediction of individual donating decision ($p < 0.05$). Generally, governance information disclosure was considered useful to donors to understand the content and adequacy of non-profit organizations (Zainon et al. 2014). Specifically, the result indicated that individual donors were more concern on the involvement of organization in community services and contactable person. However, respondents' donating decision was not influenced by the board size and list of management team as postulated by Hyndman and McDonnell (2009) and Haski-Leventhal and Foot (2016).

The first research question was answered through the output of independent *t*-test and one-way ANOVA. Gender showed significant difference in individual donating decision. This result was consistent with the previous researches which revealed that female donors tended to donate more frequently than male (Eckel and Grossman 2000; Roberts and Roberts 2012; Dvorak and Toubman 2013). However, there was no significant difference between other demographic factors such age, education, income and religion on individual donating decision. The insignificant results of other factors could be attributed to several probable reasons, one of which clearly associated with the inclination of individuals to donate varied on different regions (Schlegelmilch et al. 1997; Lwin et al. 2013; Yao 2015; Abd et al. 2015). Individuals influenced by the culture and lifestyle of different regions would perceive the satisfaction of donation differently. Another possible reason was that individual would examine types of activities engaged by non-profit organization rather than evaluating the sector itself (Handy and Katz 2008). The depth of individual's knowledge and familiarity with the organizations play important roles in individual assumption towards the non-profit sector generally. Since there are

numerous non-profit organizations available in Malaysia, this gives rise to the diverse effect of public perception towards the sector.

Hence, the supply of enough relevant information to public exerts positive impacts on non-profit organizations. People are relatively held more favourable attitudes towards the organization than others and are more likely to donate.

Conclusions

The outcome of the research framework offers a new insight regarding individual expectations of information from non-profit organization practices. The findings indicated that, except for gender, there is no significant difference between age, education, income and religion on donating decision although previous research showed their potential relevancy. By evaluating types of information required by public, our findings suggested that individual donors are more concerned on background, performance and governance information. Interestingly, financial information disclosure is not part of criteria in selecting non-profit organization to donate. Keeping public informed, especially donors, should be considered as ethical duty of all non-profit organizations. Hence, it is crucial to know what kind of information would motivate individual donors to make decisions about giving and what aspects would be perceived favourably.

References

Abd, H. M. N., Nurul, A. M. I., Hamidah, M. I., Hasan, B., Arifin, M. S., & Abdul, R. R. (2015). Characteristic affecting charitable donations behaviour: Empirical evidence from Malaysia. *Procedia Economics and Finance, 31,* 563–572.

AbouAssi, K. (2015). Testing resource dependency as a motivator for NGO self-regulation suggestive evidence from the Global South. *Nonprofit and Voluntary Sector Quarterly, 44*(6), 1255–1273.

Arshad, R., Bakar, N. A., Thani, N. Y., & Omar, N. (2013). Board composition and accountability of non-profit organizations. *Journal of Applied Business Research, 29*(4), 1021–1030.

Bekkers, R., & Wiepking, P. (2011). A literature review of empirical studies of philanthropy: Eight mechanisms that drive charitable giving. *Nonprofit and Voluntary Sector Quarterly, 40*(5), 924–973.

Bennett, R., & Savani, S. (2002). Predicting the accuracy of public perceptions of charity performance. *Journal of Targeting, Measurement and Analysis for Marketing, 11*(4), 326–342.

Bennett, R., & Savani, S. (2003). Predicting the accuracy of public perceptions of charity performance. *Journal of Targeting Measurement and Analysis for Marketing, 11,* 326–342.

Buchheit, S., & Parsons, L. M. (2006). An experimental investigation of accounting information's influence on the individual giving process. *Journal of Accounting and Public Policy, 25,* 666–686.

Connolly, C., & Hyndman, N. (2013). Towards charity accountability: Narrowing the gap between provision and needs? *Public Management Review, 15*(7), 945–968.

Deborah, L. J. (2013). Charitable giving: Baby boomers donate more, study shows. *Forbes*. http://www.forbes.com/sites/deborahljacobs/2013/08/08/charitable-giving-baby-boomers-donate-more-study-shows/#2c8774707d78. Accessed on June 30, 2016.

Department of Statistics Malaysia. (2011). *Population distribution and basic demographic characteristic report 2010*. www.statistics.gov.my

Dvorak, T., & Toubman, S. R. (2013). Are women more generous than men? Evidence from alumni donations. *Eastern Economic Journal, 39,* 121–131.

Eckel, C. C., & Grossman, P. J. (2000). Differences in the economic decisions of men and women: Experimental evidence. In C. Plott & V. L. Smith (Eds.), *Handbook of results in experimental economics*. New York: North Holland.

Fritz, J. (2014). *Charitable giving by the generations*. http://nonprofit.about.com/od/fundraising/a/generationalgivingstudy.htm. Accessed on February 22, 2016.

Gregory, D. S., Kuo, J. S., & Ho, Y. C. (2016). The determinants of voluntary financial disclosure by nonprofit organizations. *Nonprofit and Voluntary Sector Quarterly, 41*(6), 1051–1071.

Handy, F., & Katz, E. (2008). Donating behaviour: If time is money, which to give? A preliminary analysis. *Journal of Economic Studies, 35*(4), 323–332.

Haski-Leventhal, D., & Foot, C. (2016). The relationship between disclosure and household donations to nonprofit organizations in Australia. *Nonprofit and Voluntary Sector Quarterly*, 1–21

Hundley, K., & Taggart, K. (2013). Above the law: America's worst charities. *The Cable News Network (CNN)*. http://edition.cnn.com/2013/06/13/us/worst-charities/. Accessed on May 28, 2016.

Hyndman, N., & McDonnell, P. (2009). Governance and charities: An exploration of key themes and the development of a research agenda. *Financial Accountability & Management, 25,* 5–31.

Johns, G. (2004). Informed giving: Ensuring charities inform donors. *IPA Backgrounder, 16*(3), 1–12.

Jos, V. I., & Ton, V. D. W. (2008). Charities: How important is performance to donors? *International Journal of Quality & Reliability Management, 26*(1), 5–22.

Kasri, R. A. (2013). Giving behaviours in Indonesia: Motives and marketing implications for Islamic charities. *Journal of Islamic Marketing*, 306–324.

Letts, C. W., Ryan, W. P., & Grossman, A. (1999). *High performance nonprofit organizations: Managing upstream for greater impact*. New York: Wiley.

Lwin, M., Phau, I., & Lim, A. (2013). Charitable donations: Empirical evidence from Brunei. *Asia Pacific Journal of Business Administration, 5*(3), 215–233.

McFadden, R. D. (2011). William Aramony, united way leader who was jailed for fraud, dies at 84. *The New York Times*. http://www.nytimes.com/2011/11/14/business/william-aramony-disgraced-leader-of-united-way-dies-at-84.html?_r=0. Accessed on July 4, 2016

Noorbijan, A. B., Roshayani, A., Normah, O., & Wan, A. A. W. M. R. (2014). Governance and financial reporting practices: Assessment of FATF and APG guidelines on Malaysia companies limited by guarantee. *Procedia-Social and Behavioural Sciences, 145,* 254–265.

Othman, R., & Ali, N. (2014). NPO, internal controls, and supervision mechanisms in a developing country. *Voluntas, 25*(1), 201–224.

Roberts, J. A., & Roberts, C. R. (2012). Money matters: Does the symbolic presence of money affect charitable giving and attitudes among adolescents? *Young Consumers: Insight and Ideas for Responsible Marketers, 13*(4), 329–336.

Robin, L. S., & Sharon, L. O. (2010). Charitable giving to not-for-profit organizations: Factors affecting donations to non-profit organizations. *Innovative Marketing, 6*(1).

Roscoe, J. T. (1975). *Fundamental research statistics for the behavioural sciences* (2nd ed.). New York: Holt Rinehart & Winston.

Salamon, L. (2002). The resilient sector: The state of nonprofit America. In L. Salamon (Ed.), *The state of nonprofit America* (pp. 3–64). Washington, DC: Brookings Institute Press.

Saxton, G. D., Neely, D. G., & Guo, C. (2011). Web disclosure and the market for charitable contributions. *Journal of Accounting and Public Policy, 33,* 127–144.

Schlegelmilch, B. B., Love, A., & Diamantopoulos, A. (1997). Response to different charity appeals: The impact of donor characteristics on the amount of donations. *European Journal of Marketing, 31*(8), 548–560.

Schnepf, S. V., & Piper, G. (2007). *Gender differences in charitable giving*. Discussion paper series presented at The Institute for the Study of Labor (IZA), December 2007.

Sekaran, S., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th ed.). UK: West Sussex.

Simaens, A., & Koster, M. (2013). Reporting on sustainable operations by third sector organizations: A signalling approach. *Public Management Review, 15,* 1040–1062.

Tamilchelvi, S. V. C., & Ramachandran, T. (2015). The perception of donors on existing regulations and code of governance in Singapore on charities and non-profit organizations—A conceptual study. *Asian Social Science, 11*(9).

Teah, M., Lwin, M., & Cheah, I. (2014). Moderating role of religious beliefs on attitudes towards charities and motivation to donate. *Asia Pacific Journal of Marketing and Logistics, 26*(5), 738–760.

Van Der Heijden, H. (2013). Charities in competition: Effects of accounting information on donating adjustments. *Behavioral Research in Accounting, 25,* 1–13.

Woodside, A. G., Megehee, C. M., & Ogle, A. (2009). Perspectives on cross-cultural, ethnographic, brand image, storytelling, unconscious needs, and hospitality guest research. *Advances in Culture, Tourism and Hospitality Research, 3*(4), 215–308.

Yao, K. (2015). Who gives? The determinants of charitable giving, volunteering, and their relationship. *Wharton Research Scholar Journal, 5,* 126.

Yeo, S. J., & Linette, L. (2013). Fund-raising scams creating confusion. *The Straits Times*. www.straitstimes.com/singapore/fund-raising-scams-creating-confusion. Accessed on July 4, 2016.

Zainon, S., Atan, R., Yap, B. W., & Roland, Y. T. N. (2011). Institutional donors' expectation of information from the non-profit organizations (NPOs) reporting: A pilot survey. *International NGO Journal, 6*(8), 170–180.

Zainon, S., Atan, R., & Yap, B. W. (2014). An empirical study on the determinants of information disclosure of Malaysian non-profit organizations. *Asian Review of Accounting, 22*(1), 35–55.

Developing a Framework for Postgraduate Supervision

Gurnam Kaur Sidhu, Sarjit Kaur, Lim Peck Choo and Chan Yuen Fook

Abstract The twin forces of globalization and internationalization brought about the democratization of education at all levels including postgraduate study. In Malaysia, an initiative referred to as MyBrain15 under the National Higher Education Strategic Plan (NHESP) has been put in place to produce 60,000 postgraduate doctoral graduates by 2023. Despite the significant push by the government for more knowledge and innovative workforce, the success rate of MyBrain15 leaves much to be desired. One of the reasons cited for the high attrition and low completion rates among research postgraduates around the globe has been postgraduate supervision. Therefore, this study aimed to develop a framework for postgraduate supervision. The descriptive study involved 209 postgraduate students and 120 supervisors from two local universities in Malaysia. Data were collected via two questionnaires and semi-structured interviews. Based on results obtained from this exploratory study, this paper puts forward a framework for holistic postgraduate supervision based on the principles of heutagogy where all learners should be self-determined and be at the centre of their own learning.

Keywords Postgraduate study · Supervision · Supervisors · Postgraduate students · Supervisory process

G.K. Sidhu (✉) · C.Y. Fook
Faculty of Education, Universiti Teknologi MARA Selangor,
Aras 5&7, Bangunan FSK1,5, Campus Puncak Alam,
42300 Shah Alam, Selangor Darul Eshan, Malaysia
e-mail: gurnamsidhu@salam.uitm.edu.my; gurnamsidhu213@yahoo.com.my

S. Kaur
English Language Studies, School of Humanities,
University Sains Malaysia, Gelugor, Malaysia

L.P. Choo
Academy of Language Studies, UiTM, 40450 Shah Alam, Selangor, Malaysia

G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, DOI 10.1007/978-981-10-4241-6_26

Introduction

The age of information witnessed the democratization and massification of education at all levels including postgraduate education. According to the Malaysian Education Blueprint 2015–2025 (Higher Education), a 70% increase in enrolment rates was observed over the last decade to reach 1.2 million students in both public and private institutions of higher learning. Today, there is no denying that postgraduate supervision has been brought to the forefront as it has been viewed not only as an important means for creating new knowledge, but also more importantly as a means of building a critical mass of knowledge workers for both developed and developing countries all around the globe. Postgraduate supervision is widely acknowledged as a 'professional practice' and has emerged as a well-explored and evolving field of study in the West, but it is still a very unexplored terrain in the East, especially in a developing country like Malaysia.

To date, no encompassing definition has been reached for postgraduate research supervision; nevertheless, similarities do exist between many definitions put forward by scholars in this field of research. For instance, Laske and Zuber-Skerritt (1996) define research supervision as a process of fostering and enhancing learning, research and communication at the most advanced level of teaching in the educational system whilst Delamont et al. (1997) emphasize that 'good pleasurable supervision is based on self-consciousness, not intuition or flying by the seat of your pants' (p. 1) and this activity can be learnt and improved through time and practice. Sidhu et al. (2015) further reiterate that postgraduate supervision is a negotiated and facilitative relationship between a supervisor and a supervisee in a complex process where the supervisor needs to guide, coach and mentor the students towards the successful completion of a research project or thesis.

As the quest for quality education pushes boundaries across the world, institutions of higher learning (IHL hereafter) are compelled to produce high quality graduates that can contribute to new research and innovative ideas for practice and publication in high impact journals. Therefore, there is a critical call for IHL to provide quality research supervision so that students can complete their study successfully within a given time frame. This can be aided through supervision models that can help charter success for all parties in postgraduate study.

Researchers who view supervision as a research-teaching nexus have found several ways of conceptualizing it and alongside this have been debated around models of supervisory practices. These conceptualizations range from the functional/technical rational model and later the negotiated model put forward by Acker et al. (1994) to the framework of approaches to research supervision by Lee (2012). Yet, there are others like Grant (2005) who have analysed the 'apprenticeship' models and Gatfield (2005) who conducted in-depth interviews with 12 supervisors and proposed his model based on the Blake and Moulton managerial grid. The Gatfield (2005) model for supervision shown in Fig. 1 has a grid with two axes of 'support' and 'structure', and he argued that both support and structure are

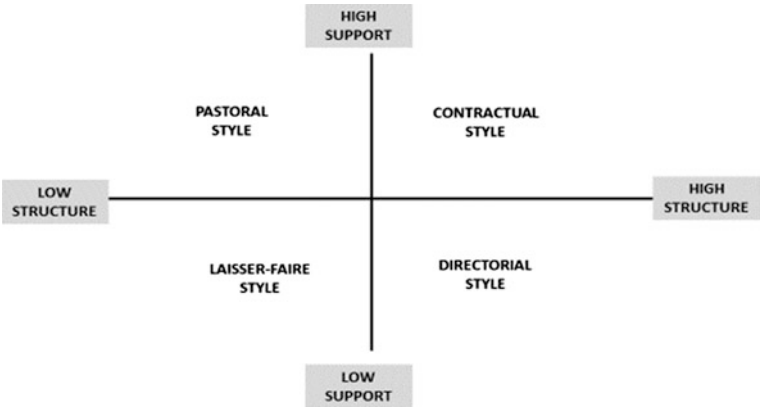


Fig. 1 Gatfield's supervisory model

often low if the supervisors practiced a laissez-faire supervision style where the supervisor is non-directive and is not committed to personal interaction and may appear to be uncaring and uninvolved in the research supervision process. In contrast to this is the contractual style where high support and high structure are provided by the supervisor who is able to provide right direction and demonstrates good managerial and interpersonal skills resulting in the candidate being highly motivated to complete the research project. In a pastoral style, the supervisor is able to provide high support and considerable support but leaves the candidate to manage the structure of their research projects. In contrast to this, in the directorial style, the reverse occurs. The supervisor provides high structure that can leave the candidate motivated but provides low support in terms of personal interaction. Gatfield (2005), however, cautions that there is no one approach that can be considered right or wrong as this often depends on the context with regard to the appropriateness and sharing expectations of the student–supervisor relationship.

With the many models available put forward by various researchers, Grant and Graham (1999) attest that there are two main ideal-type models of supervision operating in contemporary practice. One emerges from the liberal humanistic view of social relations between an autonomous supervisor and a supervisee which is largely a matter of technical rationality with the goal to help train the student in the practice of research. Such a view is also taken by Gurr (2006) who views supervision as a process to raise awareness and a form of dialogue and shared understanding between the two parties. It postulates an appropriate hands-on or hand-off supervisory style and integrates Anderson's (1988) model which characterizes the two main dimensions (i.e. a 'direct'/'indirect' and an 'active'/'passive' dimension) encompassing four styles of supervision. The Direct Active Style characterized by initiating, criticizing, telling and directing the student whilst the Passive Style signified a situation where there is little or no input from the supervisor. On the other hand, the 'Indirect Active Style' is characterized by asking for opinions and

suggestions, accepting and expanding students' ideas or asking for explanations and justifications of supervisee's statements. The 'Indirect Passive Style', on the other hand, presents a context where supervisors listen and are willing to wait for the student to process ideas and solve problems.

Meanwhile, another model postulated by Grant and Graham (1999) suggests that supervision is a negotiated process which is less universal and less predictable but nevertheless more responsive to student needs as supervision is often plagued with notions of uncertainty, uniqueness and sometimes conflict and power relations. The success of this model depends on good relationship and communication between the two parties. Sidhu et al. (2015), however, take a holistic approach towards supervision and state that supervision is often viewed as a negotiated and facilitative process which hinges on the tenets of holistic education of connectedness, wholeness and being. They highlight that 'connectedness' as perceived by Jarvis and Parker (2006), includes elements such as interdependence, interrelationship, participatory and nonlinearity and this refers to the interdependence among the student, supervisor and the institution. The concept of 'wholeness' is aligned to the rationale that whole systems have emergent properties that cannot be broken down whilst the concept of 'being' is about the student–supervisor relations as being one where both parties can fully experience the process of supervision including the fully human aspects and domains, i.e. the cognitive, emotional, physical and spiritual intelligences in a balanced and integrated manner. Hence, this holistic approach to supervision stresses the importance and interconnectedness of the student, supervisor and the institution to work collaboratively to complete the research project so that success can be achieved by all parties concerned.

Research Problem

In today's competitive global economies, there is a need for countries to develop a critical pool of knowledgeable and innovative workforce. Realizing this need, the Malaysian Ministry of Higher Education launched 'MyBrain15' which aims to produce 60,000 Malaysian Ph.D. holders by 2023. Sidhu et al. (2014) and Cassuto (2013) note that whilst postgraduate numbers have increased over the years, approximately 50–60% of students at the global level often leave without completing their doctoral studies. Furthermore, the Council of Graduate Schools (2009) noted that only 49% of Ph.D. postgraduates in the field of humanities complete within ten years; whilst, close to 64% of engineering students complete their Ph.D. within ten years. The study also added that a fraction of these postgraduate candidates often take longer than a decade to complete their study with a majority of them leaving without earning a doctoral degree. These 'disturbing' non-completion rates have pushed academics to take notice as attrition and failure to graduate on time is often tainted with connotations of a university's failure, loss and waste of human capital and funding. Researchers have cited numerous factors that can be seen as significant contributors on doctoral candidates' completion rates. These

factors include a variety of variables at play such as age, gender, candidature status (part or full time), discipline (sciences or humanities), research funding, research topic suitability, inadequate supervision, institutional facilities and access to appropriate equipment and computers. Among many of the factors cited, postgraduate supervision is often cited for high attrition and low completion rates (Sidhu et al. 2014). Therefore, there is a critical need to investigate the practices of postgraduate supervision in institutions of higher learning and develop a framework for postgraduate supervision for effective postgraduate study.

Objectives of the Study

The main objective of this study was to investigate postgraduate supervision practices with the intention to develop a framework for effective postgraduate supervision. Specifically, it aimed to look into the perspectives of both postgraduate students and supervisors concerning effective postgraduate supervision with regard to the three main key players in the supervision process, i.e. the postgraduate students (PG Students hereafter), the supervisors and the institution. The study's research objectives focused on the roles and responsibilities of students and supervisors, supervisory processes, student–supervisor relationship, student readiness and competences for postgraduate study, institution support and challenges faced by both supervisors and supervisees.

Research Methodology

Researchers such as Creswell and Clark (2006), Fraenkel et al. (2017) note that by employing a mixed methods approach, studies can provide better understanding of research problems as it helps validate and triangulate research findings. Therefore, this study employed a descriptive research design with a mixed methods approach which involved both quantitative and qualitative data collection methods.

The research study was conducted in two Malaysian public universities referred to as University A and University B. University A is a comprehensive university located in Selangor whilst University B is a research-intensive university located in Penang. The sample population comprised two main groups referred to as Sample A and Sample B. Sample A consisted of postgraduate students whilst Sample B consisted of postgraduate supervisors with more than 3 years of supervisory experience. The final sample size comprised 209 postgraduate students and 120 supervisors who were randomly selected from two faculties in each university. It included a social sciences and arts faculty and a pure science faculty from each university. All respondents were required to respond to a questionnaire. To maintain respondents' confidentiality, all respondents were coded as R1–R209 for the students and L1–L120 for the lecturers/postgraduate supervisors.

The study utilized two main research instruments. The quantitative data were obtained from two sets of questionnaires, i.e. the Postgraduate Supervisee Questionnaire (PGSQ-A) and the Postgraduate Supervisors Questionnaire (PGSQ-B). These survey instruments investigated the perspectives of both sample groups on a number of aspects such as student and supervisors' roles and responsibilities, supervisory practices, institutional support, student–supervisor relationships, student readiness for PG study and challenges faced by both groups. The questionnaires were based on a 5-point Likert scale. All the 209 PG students and 120 supervisors responded to their respective questionnaires. Both the questionnaires were validated by a panel of experts comprising 3 lecturers and the reliability of the questionnaire for supervisors stood at Cronbach alpha 0.950 ($\alpha = 0.950$) whilst the reliability of the supervisees' questionnaire stood at 0.909 ($\alpha = 0.909$) which indicated that both questionnaires were highly reliable instruments.

The qualitative data were collected via semi-structured interviews. The interviews were conducted with 12 postgraduates (6 respondents from each university—referred to as RUA1–RUA6 and RUB1–RUB6) and 6 supervisors (3 from each university—referred to as UA1, UA2, UA3, UB1, UB2 and UB3). The interview sessions sought to find out respondents' views on similar dimensions stated in the questionnaires in order to validate the quantitative data collected through the questionnaires.

Finally, all data collected were cleaned and analysed. The quantitative analysis was conducted using SPSS version 20 and involved the use of descriptive and inferential statistics such as *t*-tests and ANOVA. The qualitative data were transcribed and analysed both deductively and inductively.

Results and Discussions

The following sections will report the main findings obtained from the instruments used to examine the perspectives of both PG Students and supervisors on various aspects of postgraduate supervision which led to the development of a framework for postgraduate supervision.

Roles and Responsibilities

The results showed that both supervisors ($M = 4.92$, SD = 0.543) and students ($M = 4.87$, SD = 0.279) acknowledged the need for clear guidelines on the roles and responsibilities of both parties. A large majority of the students felt that supervisors were generally aware of their roles and felt that supervisors should be good role models in terms of research and publication ($M = 3.59$, SD = 0.581),

possess good communication skills ($M = 3.56$, SD = 0.530), provide timely and constructive feedback ($M = 3.50$, SD = 0.562), advise candidates on research ethics and instil motivation and confidence ($M = 3.62$, SD = 0.548) in them so that they can complete their research study successfully and on time. Qualitative data showed that PG students preferred a supervisor to be a 'people-oriented person' and one who 'understands them as a person first and then as a researcher'. On the other hand, supervisors felt students were on the whole responsible but could do with more commitment and responsibility in taking ownership of their own learning.

The findings show that supervisors were aware of their roles at all stages of the supervision process. Inferential findings further revealed there was a significant difference between gender, with male respondents ($M = 4.19$, SD = 0.530) being more aware about their roles and responsibilities compared to female respondents ($M = 3.88$, SD = 0.388). Further findings showed that respondents from pure science ($M = 4.14$, SD = 0.435) faculties were slightly more aware of the roles and responsibilities compared to those who were from the social sciences ($M = 4.01$, SD = 0.482). However, there was no significant difference in terms of disciplines [$t(119) = -1.502$, $p = 0.136$] at the 0.05 level. The findings also indicate that the supervisors from University B ($M = 4.08$, SD = 0.472) were slightly more aware of the roles and responsibilities compared to those from University A ($M = 4.04$, SD = 0.461). The t-test shows there was no significant difference between the universities, [$t(119) = -0.401$, $p = 0.689$)] at the 0.05 level.

On the other hand, the findings also show that PG students were moderately aware of their roles at all stages of the Ph.D. programme. The findings also indicated that there was no significant difference in their awareness of their roles in terms of gender [$t(209) = -1.205$, $p = 0.230$)] and disciplines. The findings also showed that supervisees from University B ($M = 4.52$, SD = 0.345) were more aware of their roles compared to their counterparts from University A ($M = 4.06$, SD = 0.453). There was a significant difference in the reported agreement levels between the universities, [$t(206) = -4.961$, $p = 0.000$] at the 0.05 level.

Supervisory Practices

A majority (87.5%) of the supervisors highlighted that they had not attended any formal supervision course and none of them were accredited supervisors. For most, supervision was a process they learned from their own personal experience having been supervised during their doctoral studies. Nevertheless, students expressed a moderate level of satisfaction ($M = 3.32$, SD = 0.369) with their supervisors' overall supervisory skills and stressed supervisors need to possess a pleasant personality with good research, communication, negotiation, problem-solving and decision-making skills. They further highlighted that a good supervisor is one who is kind, understanding and does not 'scold', 'look down' or 'talk condescendingly' to students. They should be 'patient' and willing to give time to students to learn

and improve. Supervisors further reiterated that supervision is like 'good parenting' and they need to be friendly, supportive, motivating, patient and generous with their time. Nevertheless, they also need to be firm at times and provide reasonable time lines and monitor students' progress to ensure they successfully complete their research project. All respondents agreed that supervisors need to be professional and maintain integrity at all times. Both parties also agreed that effective postgraduate supervision required both parties to have a good relationship with mutual respect for each other.

PG Student Competencies and Readiness for Postgraduate Study

This aspect of the study investigated PG students' readiness in terms of their critical reading, writing, research and conceptual skills. The study also explored their competency in digital literacy and ability to take responsibility for their own learning. Results indicated that PG students felt they were only moderately ready ($M = 3.53$, SD = 0.576) in terms of writing whilst their supervisors felt they possessed limited readiness ($M = 2.94$, SD = 0.74). The *t*-test further confirmed that the difference between the two groups was significant at $p < 0.05$ ($t[320] = 7.909$). A similar significance was seen in terms of students' critical reading skills where the independent samples *t*-test result indicated that the PG students perceived that they have a higher readiness in reading skills ($M = 3.51$, SD = 0.696) when compared to their supervisors' perceptions ($M = 2.96$, SD = 0.751). A similar pattern was also seen in terms of students' digital literacy and use of digital tools in research.

Supervisors indicated that PG students possessed limited readiness in postgraduate study in terms of the possession of important skills such as research skills ($M = 2.94$, SD = 0.741) and conceptual skills ($M = 2.81$, SD = 0.877). They also highlighted that PG students possessed moderate readiness in terms of locating information related to own studies ($M = 3.12$, SD = 0.887), understanding the finished research proposal/thesis format ($M = 3.11$, SD = 0.929) and using information to find answers to pre-research questions ($M = 2.99$, SD = 0.832). They also agreed that their students have limited readiness in terms of evaluating, analyzing and synthesizing information for use in the proposal/thesis ($m = 2.90$, SD = 0.841), forming/organizing a search strategy ($M = 2.85$, SD = 0.963) and formulating research questions ($M = 2.74$, SD = 0.909). Supervisors also stressed that PG students' digital literacy in using digital tools for research was at a moderate level, but their dependence on their supervisor was high indicating that their level of independence and autonomy was low in taking responsibility for their own learning and research project.

Based on the above findings, universities perhaps need to address the lack of readiness among PG students for research study. According to Hattie and Marsh

(1996), 'universities need to set as a mission goal the improving of the nexus between research and teaching' where not only 'good teaching and research have an occasion to meet' but more importantly provide the right circumstances for 'demonstrating the integration between teaching and research' (p. 533).

Institutional Aspects

On the whole, both students (M = 3.03, SD = 0.523) and supervisors (M = 3.27, SD = 0.482) expressed moderate satisfaction with information and services provided by their institutions. Students expressed a low level of satisfaction towards institutional support (M = 2.74, SD = 0.589) such as information on postgraduate programmes (M = 2.86, SD = 0.726), guidelines of postgraduate programmes (M = 2.86, SD = 0.788) and information on academic staff (M = 2.80, SD = 0.689). They were least satisfied with the lack of financial funding to present their work at conferences (M = 2.52, SD = 0.780) and a suitable work space and access to facilities (M = 2.52, SD = 0.943). Data obtained from open-ended questions and interview sessions further corroborated these findings. Likewise, supervisors also expressed moderate (M = 3.15) satisfaction but felt that facilities for postgraduate students (M = 2.53), resources available (M = 2.50), financial grants and fellowship applications (M = 2.28, SD = 0.733), training and workshops (M = 2.37, SD = 0.573) for both students and supervisors left much to be desired.

Challenges and Issues

Another aspect explored were the challenges faced by both parties. Supervisors lamented students' limited readiness for postgraduate study in terms of writing and critical literacies and insufficient funding and training for both students and supervisors from their respective institutions. Students however felt that supervisors were more concerned with the cognitive aspect of the supervisory process and failed to be more caring and understanding as they were mature doctoral students who take upon numerous roles such as full-time wage earners for the family, a spouse, a mum or dad, a daughter or son helping the immediate and extended Asian family. They also felt that some supervisors often did not to keep to scheduled meetings and were often difficult to contact whilst others felt supervisors did not provide timely and constructive feedback. This finding was also reiterated in a study carried out by Ismail et al. (2013) who highlighted that the students' three main contentions were power conflicts in the student–supervisor relationship, their supervisors' lack of positive communication and their lack of expertise to provide constructive feedback and support.

Contribution of the Study

Based on the initial findings of this study, given in Fig. 2 is the proposed postgraduate supervision framework for effective postgraduate study. This framework highlights the holistic development in all learning domains and the interconnectedness and interdependence of the three main players in the process, namely the institution, the supervisor and the PG student. All members must be responsible for their own roles and embrace growth and development as postulated by heutagogy—the study of self-determined learning put forward by Hase and Kenyon (2000). In such a context, all members of the supervisory process must view themselves as learners on the learning curve and be willing to take responsibility for their own learning. Consequently, all parties concerned need to acquire competencies and capabilities that can best help fulfil their roles, responsibilities and learning obligation so that they can take appropriate and effective action not only to improve themselves, but also to challenge and solve problems in the supervisory process that can result in a positive and productive output.

The following points highlight key aspects of the proposed framework:

- The framework proposed is based on the tenets of a holistic approach which hinge on the fundamental principles of connectedness, wholeness and being (Jarvis and Parker 2006). Therefore, this framework emphasizes the importance of mutual respect, interconnectedness and interdependence among the three main players, i.e. the student, the supervisor and the institution.

Fig. 2 A postgraduate supervision framework for effective postgraduate study

- The framework also highlights that for a meaningful and engaging relationship to exist, each party should be aware and take full responsibility of their respective roles alongside best practices and professional development opportunities, whereby everyone is allowed to grow and develop their full potential. Therefore, supervisors must be clear about their roles and responsibilities and ensure their students benefit from the best practices in supervision. For instance, the findings indicated that PG students looked for a 'people-orientated' supervisor who not only can motivate and inspire them, but also understand the numerous roles they take upon as mature doctoral students which at times leaves them physically, emotionally and cognitively drained (Sidhu et al. 2015). On the other hand, supervisors are often left frustrated with PG students' limited readiness for postgraduate study. Such tensions should and can be addressed in a framework where institutions embrace the principles of heutagogy and are willing to sit at the same table and ensure a win-win situation for all parties concerned.
- The framework also incorporates the noble aspirations set out by Malaysia's National Education Philosophy (NEP) where education is seen an ongoing process and all learning is based on the four main domains, so that students are cognitively, spiritually, emotionally and physically balanced. PG students in this study also emphasized the need for supervisors to be more understanding, sympathetic and empathetic as a majority of them were working adults with spouses and families to take care of. Hence, this framework supports the need for supervisors to shift from a strong cognitive and didactic inclination to a more balanced outlook with some emphasis given not only to emotional and spiritual intelligence, but also the physical well-being of PG students. All these domains need to be addressed and harnessed by all three parties to ensure that effective and holistic development are achieved by both academics and students alike.
- Finally, writing a postgraduate thesis is not a linear process and supervisors have to deal with the cognitive and the emotional experience of the supervisees. It highlights the importance of a good student–supervisor relationship and the support of the institution in terms of guidelines, procedures, facilities, training and adequate funding. With the principles of heutagogy in place, and each party being a self-determined learner, both students and supervisors alike will grow not only in self-efficacy, but will also develop positive values that encourage twenty-first century learning attributes such as better engagement, team work, communication and creativity. When good academics are surrounded by a team of highly motivated student researchers alongside a supportive institution, all parties will be rewarded with a vibrant and productive outcome.

Conclusions

The findings of this study highlight the needs for all the three partners in the learning process (students, supervisors, institution) to have a clear understanding of their roles and responsibilities as self-determined learners so that success can be achieved in helping postgraduate students complete their research study successfully and in time. The implications of this study necessitate that all partners work collaboratively towards achieving a mutual goal. Effective postgraduate supervision has implications for future students' lives and workplace demands. Employers around the globe expect postgraduate students to possess a high degree of innovation besides being able to conceive new ideas, services and practices with the aim of improving the current state of knowledge. Hence, this study puts forward a call for supervisors, students and institutions to think about adopting a holistic postgraduate supervision model based on the principles of heutagogy where each party is a self-determined learner. In such a context, postgraduate students will be more willing to take responsibility for their own learning and equip themselves with much needed research and conceptual skills during the course of their studies towards successful and timely postgraduate degree completion.

Finally, it should be emphasized that this exploratory study is a work-in-progress and the researchers are still exploring and working towards a more comprehensive framework whereby the noble aspirations of the Malaysian MyBrain15 initiative can be fully realized.

Acknowledgements The authors would like to express appreciation for the support of the Ministry of Education, Malaysia, and UiTM for the FRGS funding for this project [Project Number = 600-RMI/FRGS 5/3(138/2013)].

References

Acker, S., Hill, T., & Black, E. (1994). Thesis supervision in the social sciences: Managed or negotiated. *Higher Education, 28*(4), 483–498.

Anderson, J. (1988). *The supervisory process in speech language pathology and audiology* (pp. 49–62). Boston: College Hill Press and Little Brown.

Cassuto, L. (2013). Ph.D. attrition: How much is too much? *The Chronicle of Higher Education*. Retrieved on July 3, 2014 from http://chronicle.com/article/PhD-Attrition-How-Much-Is/140045/

Council of Graduate Schools. (2009). *Research students and supervisor*. Retrieved on August 30, 2012 from http://cgsnet.org/research-student-and-supervisor

Creswell, J. W., & Clark, V. L. P. (2006). *Designing and conducting mixed methods research*. USA: Sage Publications.

Delamont, S., Atkinson, P., & Parry, O. (1997). *Supervising the PhD: A guide for success*. Buckingham, UK: The Society for Research into Higher Education and Open University Press.

Fraenkel, J., Wallen, N., & Hyun, H. (2017). *How to design and evaluate research in education* (8th ed.). USA: McGraw Hill Education.

Gatfield, T. J. (2005). An investigation into PhD supervisory management styles: Development of a dynamic conceptual model and its managerial implications. *Journal of Higher Education Policy and Management*, *27*(3), 311–325.

Grant, B. M. (2005). *The pedagogy of graduate supervision: Figuring the relations between supervisor and student* (Ph.D. thesis). The University of Auckland, Aotearoa New Zealand.

Grant, B., & Graham, A. (1999). Naming the game: Reconstructing graduate supervision. *Teaching in Higher Education, 4*(1), 77–89.

Gurr, G. (2006). *The supervisor/student alignment—Tool kit*. Australia: The University of Sydney.

Hase, S., & Kenyon, C. (2000). *From andragogy to heutagogy.* ultiBASE. Faculty of Education Language and Community Services, RMIT University.

Hattie, J., & Marsh, H. W. (1996). The relationship between research and teaching: A meta analysis. *Review of Educational Research, 66,* 507–542.

Ismail, H. M., Majid, F. A. & Ismail, I. S. (2013). "It's complicated" relationship: Research students' perspective on doctoral supervision. *Procedia—Social and Behavioral Sciences, 90*, 165–170.

Jarvis, P., & Parker, S. (2006). *Human learning: A holistic approach*. New York: Routledge.

Laske, S., & Zuber-Skerritt, O. (1996). *Frameworks for postgraduate research and supervision*. Lismore: Southern Cross University Press.

Lee, A. (2012). *Successful research supervision: Advising students doing research*. UK: Routledge.

Sidhu, G. K., Kaur, S., Chan, Y. F., & Lee, L. F. (2015). Establishing a holistic approach for postgraduate supervision. In S. F. Tang & L. Logonnathan (Eds.), *Taylor's 7th Teaching and Learning Conference 2014 Proceedings* (pp. 529–545). Singapore: Springer Publishing.

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, 90,* 151–159.