Siew Fun Tang
Swi Ee Cheah *Editors*

Redesigning Learning for Greater Social Impact

Taylor's 9th Teaching and Learning Conference 2016 Proceedings

Springer

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Siew Fun Tang
Taylor's University
Subang Jaya, Selangor
Malaysia

Swi Ee Cheah
Taylor's University
Subang Jaya, Selangor
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Foreword

With the evolving and fluid nature of the education field, there is a need for educators to not only influence the discipline-specific knowledge of their students but also incorporate social responsibility aspects into the pedagogy. It is time for education institutions to rethink, redesign learning, improve pedagogy, and build academic programmes to meet emerging social needs of a complex and changing world. We need to deliver social impact education and prepare students to be socially responsible practitioners and advocators in their communities.

This year, the Taylor's 9th Teaching and Learning Conference 2016 (TTLC2016) has chosen to focus on "Redesigning Learning for Greater Social Impact" to challenge attendees to create a more comprehensive understanding of social and/or socio-emotional learning and how it relates to theories, research, practice, policy, technology, and success stories taking place in classrooms worldwide. TTLC2016 aims to explore in breadth, depth, and quality the best models and practices, strategies, lessons learnt, and success stories from design of pedagogical intervention and learning culture, to the inclusion of socio-emotional support in teaching and policy to transforming technology to support the social fabric of education institutions.

Additionally, the conference aims to provide fertile ground to stimulate and challenge established beliefs about learning. The manuscripts focus on the subthemes-related innovative learning processes for greater social impact, social and emotional development, use of technology in learning, global student experiences, teaching and learning culture, policies and transformation on social learning culture, and other related topics on socio-emotional teaching and learning.

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Student Experiences and Social Emotional Development

Chapter 1
Correlation Study Between CGPA and PO Attainments: A Case Study for Taylor's University School of Engineering

Reynato Andal Gamboa, Satesh Namasivayam and Ramesh Singh

Abstract Despite the decades-long implementation of outcome-based education (OBE) in engineering education, the cumulative grade point average (CGPA) is still being used by many employers as the sole metric of the graduate's performance. CGPA indicates the general abilities of a graduate but not specific enough to identify whether the abilities he possessed is fit for the job. Generally, employers want to see what the graduate can do. In the growing competitiveness in the job market, employers are now looking for engineering graduates with the right hard and soft skills that could handle the complexity of the job. This is a major reason why universities offering engineering programmes are employing OBE framework in its quest to prepare graduates to be job-ready upon graduation. In spite of this, recent literature revealed that many employers find it difficult to get the right graduate for a specific engineering job. This reflects the inability of CGPA to show what the graduate knows and is able to do upon graduation. The questions now are "Do graduates with high CGPA possess adequate skills to be job ready?" and "Do graduates with low CGPA possess inadequate skills to be job ready? This paper presents a correlation study between CGPA and programme outcomes (PO) attainments to determine whether they are convergent or divergent. The result of this study can serve as a basis whether CGPA can still be considered as a valid metric of job performance or should it be supplemented by a PO certificate to complement the CGPA.

Keywords Cumulative grade point average · Integrated grade point average · Programme outcomes

R.A. Gamboa (✉) · S. Namasivayam
Taylor's University, Subang Jaya, Selangor, Malaysia
e-mail: reynatoandal.gamboa@taylors.edu.my

S. Namasivayam
e-mail: sateshnarayana.namasivayam@taylors.edu.my

R. Singh
University of Malaya, Kuala Lumpur, Malaysia
e-mail: ramesh79@um.edu.my

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1.1 Introduction

Due to the complexity of engineering jobs brought about by increasing world interconnectedness and cultural exchanges (globalization), the Washington Accord (WA) was signed in 1989 to raise the bar of the engineers' preparedness to face the challenges of the twenty-first century (Karim, 2014; Sunthonkanokpong, 2011). It aims to ensure equivalency among accredited programmes of signatory member countries. Under the accord, an engineering graduate of an accredited programme has the educational qualification for licensure, registration, and practice in another signatory member country (Milligan, 2011). The WA also mandates the Institution of Higher Learning (IHL) to adopt outcome-based education (OBE) in engineering programmes and undergo accreditation guided by the accrediting agency assessment criteria. Under this criteria, future engineers are expected to possess attributes such as lifelong learners, critical thinkers, effective communicators, high ethical standards and professionalism, ingenuity and creativity, business and management skills, leadership skills, and dynamic and resilient, among others (National Academy of Engineering, 2004).

More than a decade ago since OBE implementation, employers are still struggling to find the right candidate for a specific engineering job. The survey conducted by ManpowerGroup (2015) revealed that in the Asia-Pacific region, the talent shortages range from 28 to 48% from 2006 to 2015, respectively. JobStreet.Com (2015) in its 2015 Job Outlook Report posted that up to 69% of the employers had difficulty in getting candidates with the right skills and 29% were unable to find candidates that match the job criteria. The Aspiring Minds (2014) of India in its 2014 Employability Report stated that only 7.47% of engineering graduates are employable. All these reports found out that the reasons for this difficulty are that candidates lack hard skills and soft skills, particularly communication skills. This means that the IHLs are not doing enough to prepare the graduates according to the needs of the industries. This could be a case of grade inflation in which Rojstaczer and Healy (2012) said that in a wide range of schools, A's represent about 43% of all letter grades for the last 70 years, an increase of 28% since 1960. Sadler (2015) noted that the student's grade awarded and his level of achievement are not comparable. Similarly, Roth (1996) found that reported grades in earlier decades of the twentieth century are a significantly better predictor of job performance than those grades reported in the later decades. This theory of grade inflation is believed to be still being practised by many IHLs to this date and had not done enough to assess the students' graduate attributes for him to be job ready. Assessment drives learning (Boud, 2010) and should show the extent to which the student achieved the needed skills. According to Lazlo Bock, a senior Vice-President of Google, "CGPAs doesn't matter"; instead, they are using "structured behavioural interviews" to assess candidates (Rice, 2013). Brown (2015) articulated that "CGPA isn't everything" and employers are looking at skills, qualities, and experiences that CGPA does not capture. A number of IHLs are currently doing some initiatives to address this concern by capturing the student's activities including involvements in

extracurricular activities that are not captured in the academic transcript. Among those initiatives are the "Shine Programme" (Taylor's University, 2015) and integrated CGPA for selected universities in Malaysia (Irsyad, 2015). However, these initiatives are still in their infant stage and no outcomes yet had been generated. Another alternative or supplement to CGPA is the PO attainment. This is the focus of OBE implementation with the objective of assessing the PO attainment of each student for the improvement of the teaching and learning activities in the programme. Figure 1.1 shows the OBE framework based on the Engineering Accreditation Council (EAC) Manual 2012 of Malaysia (Gamboa & Namasivayam, 2013).

As indicated in Fig. 1.1, the OBE framework adopts the top-down design and bottom-up implementation and assessment approach (Killen, 2000). It consists of three levels of outcomes assessment as follows:

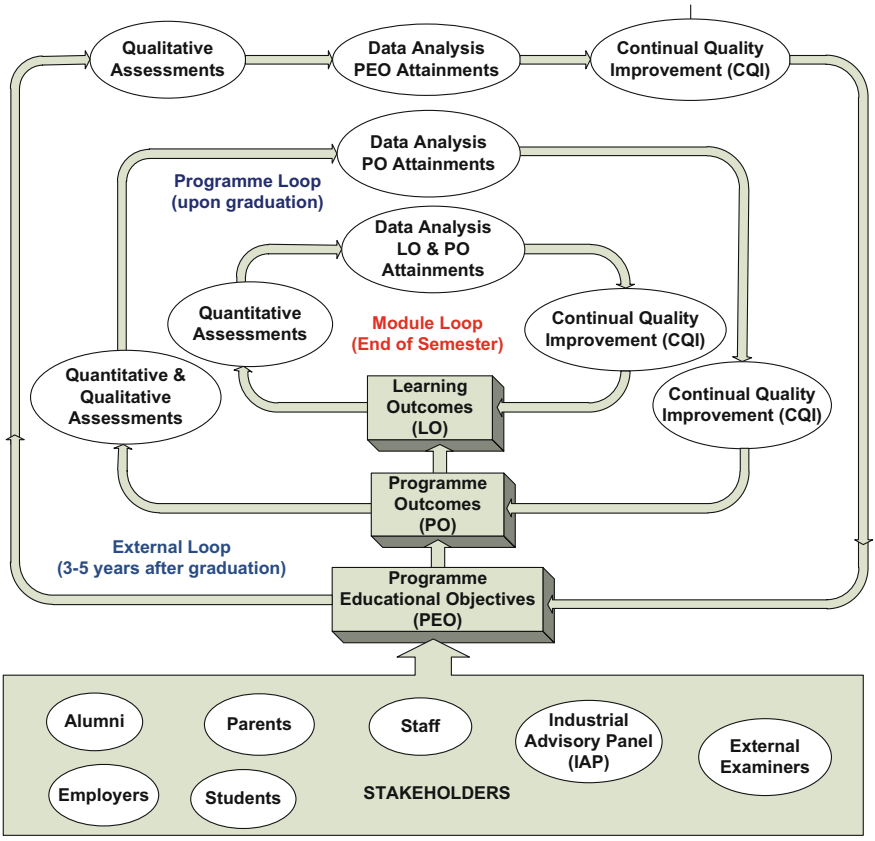

Fig. 1.1 OBE process model based on EAC manual

- **Inner Loop**—This is the LO assessment loop at the module level. The LO and PO attainments of the students in the module are conducted at the end of the semester. The LO and PO results are then analysed to determine the effectiveness of the implementation of the previous CQI plan in proving the student's performance. A new CQI plan is then developed for the succeeding semester to further improve the teaching and learning activities in the module. A direct assessment is usually employed.
- **Middle Loop**—This is the PO assessment loop at the programme level conducted for each cohort upon graduation. It also generates the PO attainment of each student and the PO attainment of the cohort. CQI plan is also developed to improve the programme and hence improve student's learning experiences to maximize their learning potential. Both direct and indirect assessments can be conducted.
- **Outer Loop**—This is the PEO assessment loop at the school level. It is conducted 3–5 years after graduation and usually done through indirect assessment.

The manual also adopted the WA 12 generic POs that each student is expected to achieve upon graduation:

1. **Engineering Knowledge**. Apply knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems;
2. **Problem Analysis**. Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences;
3. **Design/Development of Solutions**. Design solutions for complex engineering problems and design systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations;
4. **Investigation**. Conduct investigation into complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions;
5. **Modern Tool Usage**. Create, select, and apply appropriate techniques;
6. Resources, and modern engineering and IT tools, including prediction;
7. Modelling, to complex engineering activities, with an understanding of the limitations;
8. **The Engineer and Society**. Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to professional engineering practice;
9. **Environment and Sustainability**. Understand the impact of professional;
10. Engineering solutions in societal and environmental contexts demonstrate knowledge of and the need for sustainable development;
11. **Ethics**. Apply ethical principles and commit to professional ethics;

12. Responsibilities and norms of engineering practice;
13. **Communication**. Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions;
14. **Individual and Team Work**. Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings;
15. **Lifelong Learning**. Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change;
16. **Project Management and Finance**. Demonstrate knowledge; and
17. Understanding of engineering and management principles and applying these to one's own work, as a member and leader of a team, to manage projects and in multidisciplinary environments.

One of the objectives of OBE is to assess the level of students achievement of the POs—the graduate attributes and competencies. This paper would like to assess the relationship between CGPA and PO attainments to answer the following questions:

- Do graduates with high CGPA possess adequate skills to be job ready?
- Do graduates with low CGPA possess inadequate skills to be job ready?
- How is PO attainment related to CGPA?

1.2 Methodology

The Taylor's Mechanical Engineering programme was used to evaluate the relationship between CGPA and PO attainments. The programme adopted the 12 POs of EAC which were reworded to support the PEOs and the niche of the school. In particular, data from two graduate cohorts (August 2015 and March 2016 semesters) of the programme were used in this study. In a number of conferences and OBE workshops attended by the authors, OBE experts emphasized the use of culminating (modules taken in the final year) and significant modules in PO assessment. This is supported by Killen (2000) who stressed that assessment should reflect the knowledge and skills that are most important for students to learn. The University of Hawaii (2015) also expressed that students performed best if they are *introduced* to the PO and given more time and opportunities to *reinforce* their learning skills before being *assessed*. Similarly, the Engineering Accreditation Council (2012) manual listed the prescribed minimum significant modules that an OBE curriculum should offer. Thus, the PO model based on selected modules was used to generate the students' PO attainment for the above-mentioned cohorts. This is also endorsed by the Mechanical Engineering programme of the school. Inputs to this study are the modules assessments marks of each student in the cohort as well

as their respective CGPAs. The number of modules used in PO assessment is about 50% of the entire curriculum modules. Table 1.1 shows the PO mapping of selected modules used for PO assessment.

It can be observed in Table 1.1 that the selected modules are distributed in the various years with more modules included towards year 3 and year 4. The students' PO attainment was calculated using the End of Semester Assessment Tool (ESAT) developed at the module-level and programme-level assessments. Each student's PO scores were used to calculate the integrated CGPA (ICGPA) as illustrated in Fig. 1.2. In line with the experts' view on the importance of culminating and significant modules, the emphasis of these modules in PO assessment is deemed necessary for a more valid result. Due to the absence of literature on the quantifiable weight of each module, as they progressed over the years, the authors proposed the adoption of PO constants of 10, 20, 30, and 40% weight for year 1, year 2, year 3,

Table 1.1 Selected modules to PO mapping

Modules	Programme outcomes (PO)											
	1	2	3	4	5	6	7	8	9	10	11	12
Year 1												
ENG1223	x	x	x									
ENG1243	x	x	x									
ENG1233	x	x		x								
ENG1213	x	x		x								
Year 2												
ENG2313	x	x			x							
ENG2423						x				x		x
ENG2513		x	x				x			x		
MEC2213	x	x										
Year 3												
ENG3243		x										
MEC3913			x		x		x		x		x	x
ENG3723		x			x							
ENG3413			x			x				x		
MEC3923			x	x			x					x
MEC3313		x		x	x							
Year 4												
ENG4213		x										
MEC4713	x	x										
ENG4913	x	x	x	x	x	x	x		x		x	x
ENG4623						x	x	x				
ENG4926	x	x	x	x	x	x	x		x		x	x
ENG4213		x										
Snapshots	11	15	6	8	7	5	6	2	4	3	4	5

SEM.	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8
%Wt	5%	5%	10%	10%	15%	15%	20%	20%
Accu. PO								
IGPA								
ICGPA								
GPA								
CGPA								

80	100	A	4.00	Excellent
75	79	A-	3.67	Very Good
70	74	B+	3.33	Good
65	69	B	3.00	
60	64	B-	2.67	Acceptabl
55	59	C+	2.33	Pass
50	54	C	2.00	
47	49	D+	1.67	Marginal
44	46	D	1.33	Pass
40	43	D-	1.00	
0	39	F	0.00	Fail

Fig. 1.2 ICGPA calculation of PO attainment

and year 4 modules, respectively. The weights were distributed accordingly—say, 5% each for semesters 1 and 2, 10% each for semesters 3 and 4, 15% each for semesters 5 and 6, and 20% each for semesters 7 and 8, respectively. This is to give more emphasis to the higher year modules since they were believed to be where the students are expected to demonstrate the intended learning outcomes.

In Fig. 1.2, for each student and for each semester, the accumulated PO attainment was calculated (average of the 12 POs) and the corresponding ICGPA is computed according to Eqs. 1.1, 1.2 and 1.3.

For Sem 1,

$$\mathrm{ICGPA}_{1} = \mathrm{IGPA}_1 \times 100\% \tag{1.1}$$

For Sem 2,

$$\mathrm{ICGPA}_2 = \mathrm{IGPA}_1 \times 5\% + \mathrm{IGPA}_2 \times 95\% \tag{1.2}$$

…

For Sem n,

$$\mathrm{ICGPA}_n = \mathrm{IGPA}_{n-1} \times \sum_{j=1}^{n-1} \%\mathrm{Wt}_j + \mathrm{IGPA}_n \times \left(1 - \sum_{j=1}^{n-1} \%\mathrm{Wt}_j\right) \tag{1.3}$$

From Eq. 1.2, the ICGPA at semester 2 is calculated based on 5% of IGPA for semester 1 plus 95% of IGPA of semester 2. The IGPA is estimated based on the conventional grade table shown in Fig. 1.2. In general, for any semester n, the ICGPA is calculated based on Eq. 1.3.

1.3 Results and Discussion

With the implementation of Eq. 1.3 into ESAT for the graduates of August 2015 and March 2016 semesters, the 12 PO attainments were generated for each student using the selected modules listed in Table 1.1. From these results, the CGPA versus ICGPA result was generated as shown in Figs. 1.3 and 1.4 with 17 and 29 students, respectively. The students' name was made hidden to protect their identities. It can be observed from Figs. 1.3 and 1.4 that generally good students have good CGPA and ICGPA result and low-performing students have low CGPA and low ICGPA result.

Using the data in Fig. 1.3, a two-paired sample *t test* was conducted to determine the correlation between CGPA and ICGPA. The *p* value of a two-tailed test at 5% level of significance is 0.262661. This result means that there is no significant difference between CGPA and ICGPA which further concludes that there is no significant difference between CGPA ad PO attainments. The same test was conducted for the March 2016 semester graduates and yields a *p* value of 0.536293 at 5% level of significance. Again, this result means that there is no significant difference between CGPA and PO attainments. Figures 1.5, 1.6 and 1.7 show the snapshots of the comparison of CGPA and ICGPA for a good, average, and below average CGPA performance of a student in this study.

It can be observed from the web diagram of Figs. 1.5, 1.6 and 1.7 how the CGPA and ICGPA vary from semester 1 to semester 8. There are some spikes from both CGPA and ICGPA which might be due to some student's uncertainties, but generally, the results go hand in hand in the majority of the semesters.

MECHANICAL ENGINEERING				MAY-16	
NO.	STUD. ID	NAME OF STUDENTS	INTAKE	CGPA	ICGPA
1	1102B78174	AHMED SAEED ABOOD BAHAGARI	Feb-11	2.59	2.60
2	0907G73676	FAZRIN AZWAR BIN ABDUL KARIM	Feb-11	2.60	2.67
3	0301343	JANG KYUNG MOON	Feb-11	2.37	2.20
4	1003G78554	JOEL RYAN IMANUEL	Feb-11	2.41	2.67
5	1102B13037	MUHAMMAD FUAD ABRY	Feb-11	2.58	3.26
6	1007C79836	AMIR JAVAD KARIMI TABASSI	Sep-11	2.77	3.00
7	0300078	ADRIAN KHOO KAH WEI	Mar-12	2.60	3.26
8	1006Q79095	CASSANDRA LOW ZHIU YEE	Mar-12	3.02	3.33
9	0308857	GAVIN NEO HUNG MING	Mar-12	3.46	3.33
10	0308995	GOH KOK CHONG	Mar-12	3.44	3.74
11	0305292	LEE CHUN TAT	Mar-12	3.27	3.26
12	0309330	LOW HENG YANG	Mar-12	3.10	3.07
13	0310046	MARCUS LIM BO SHEN	Mar-12	2.71	2.74
14	0308001	MUHAMMAD HIDAYAT BIN HAMZA	Mar-12	3.33	3.60
15	1101Q13390	NAVID TOOSISAIDY	Mar-12	3.55	3.74
16	0310009	TAN WEI TAR	Mar-12	3.48	3.33
17	1001A76318	TEOH WY SEAN	Mar-12	2.85	2.00

Fig. 1.3 CGPA versus ICGPA result for August 2015 graduates

MECHANICAL ENGINEERING				NOV-16	
NO.	STUD. ID	NAME OF STUDENTS	INTAKE	CGPA	ICGPA
1	1010811362	PANG CHUAN YAO	Oct-10	2.49	2.74
2	1001Q75358	SUNDRRAKANNAN A/L ARUMUGAM	Feb-11	2.47	2.20
3	1007G10198	AISYAH HANIS BINTI ABDUL AZIZ	Mar-12	2.76	3.20
4	0309024	ALEXANDER LUKE LAIMON	Mar-12	2.92	2.40
5	0310328	BHAKTI A/LVENUGOPAL	Mar-12	2.75	2.13
6	0304559	GEORGE KENJI PUTRA	Mar-12	2.61	2.46
7	1101G12179	NG YI MING	Mar-12	2.88	3.00
8	0311666	AHMED FIRDAUS BIN AHMED FARID	Aug-12	2.66	2.26
9	0312741	AZZAM SYAFIQ BIN SAMSUDDIN	Aug-12	2.69	2.74
10	0312551	IZZAZ ISKANDAR BIN ISMAIL	Aug-12	2.49	2.87
11	0309027	JASON LAW SIE WEI	Aug-12	3.48	3.20
12	0304130	JOSHUA THEAH YOON KEAN	Aug-12	2.81	3.26
13	0303713	JUSTIN MOO XIAN YUEN	Aug-12	3.33	3.26
14	0302926	KONG YE KAI	Aug-12	3.50	3.87
15	1006A79606	LAM JIANG KAI	Aug-12	2.90	3.13
16	1101A13128	LEE DENG CHERNG	Aug-12	2.32	2.07
17	0311426	LEE KAR FAI	Aug-12	2.81	2.93
18	0303116	LEONG YOK BEN	Aug-12	2.99	3.26
19	0311893	LIM HAOCHUAN	Aug-12	2.89	2.93
20	0310663	MANISH KUMAR SING DOMUN	Aug-12	3.31	3.00
21	0312731	MUHAMMAD AKMAL BIN ZULKIFLI	Aug-12	2.48	2.13
22	0303585	NARESH A/L JEYAPALAN	Aug-12	3.42	3.54
23	0312150	OOI CHONG KIAT	Aug-12	3.04	2.74
24	0303581	SITI SARAH BINTI MOHD ARIFF	Aug-12	3.07	3.07
25	0303341	SOH ZHENG PEI	Aug-12	3.43	3.20
26	0302390	TENGKU MOHAMAD FARIS BIN TEN	Aug-12	3.35	3.60
27	0303017	THOMSON HEE CHIN SIONG	Aug-12	2.98	2.93
28	0311147	TOH KHAI LIANG	Aug-12	3.69	3.47
29	0312119	WAI WAI	Aug-12	2.80	2.74

Fig. 1.4 CGPA versus PO attainment for March 2016 graduates

(a)

INTEGRATED CGPA CALCULATION FOR SELECTED MODULES								
SEMESTER	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8
PO1	70.79	62.75	72.73	69.23			70.21	66.67
PO2	70.79	64.00	76.32	63.93	69.00		65.63	71.67
PO3	82.61		80.77		84.44	81.13	75.00	72.73
PO4		52.00				76.47	77.78	66.67
PO5			72.73		75.00		75.00	66.67
PO6				58.82		75.00	83.33	66.67
PO7			77.78		87.50	76.19	70.97	66.67
PO8							78.57	
PO9					80.00		73.68	71.43
PO10			77.27	65.22		71.43		
PO11					87.50		72.73	70.00
PO12				73.33	80.00	65.57	100.00	80.00
AVE. PO	75	60	76	66	80	74	77	70
IGPA	3.67	2.67	3.67	3.00	4.00	3.33	3.67	3.33
ICGPA	3.67	2.72	3.57	3.13	3.70	3.63	3.47	3.60
GPA	3.13	3.40	3.56	3.33	3.33	3.13	3.47	3.40
CGPA	3.13	3.27	3.37	3.36	3.36	3.32	3.34	3.35

(b)

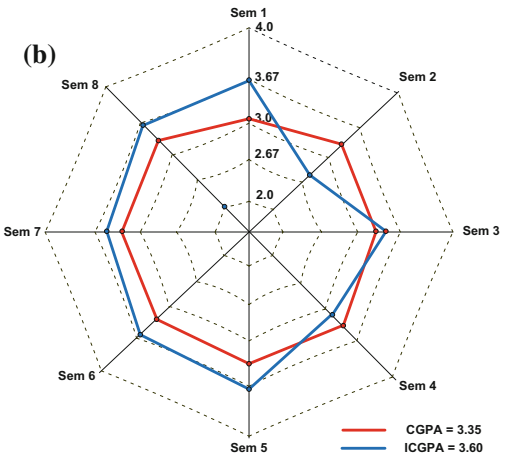

Fig. 1.5 Good student: **a** ICGPA calculation and **b** web diagram

(a)

INTEGRATED CGPA CALCULATION FOR SELECTED MODULES								
SEMESTER	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8
PO1	77.53	70.59	66.67	69.23			59.57	66.67
PO2	77.53	80.00	72.37	62.30	69.00		65.63	59.17
PO3	86.96		76.92		77.78	75.47	62.50	72.73
PO4		68.00				76.47	66.67	66.67
PO5			66.67		80.00		68.75	66.67
PO6				70.59		71.43	64.58	66.67
PO7			77.78		50.00	76.19	61.29	66.67
PO8							64.29	
PO9					80.00		63.16	71.43
PO10			72.73	56.52		61.90		
PO11					50.00		63.64	70.00
PO12				66.67	80.00	75.41	66.67	80.00
AVE. PO	81	73	72	65	70	73	64	69
IGPA	4.00	3.33	3.33	3.00	3.33	3.33	2.67	3.00
ICGPA	4.00	3.36	3.33	3.07	3.23	3.33	3.07	2.74
GPA	3.42	3.17	3.19	2.93	2.33	2.87	2.89	3.07
CGPA	3.42	3.29	3.29	3.16	2.99	2.96	3.04	3.04

(b)

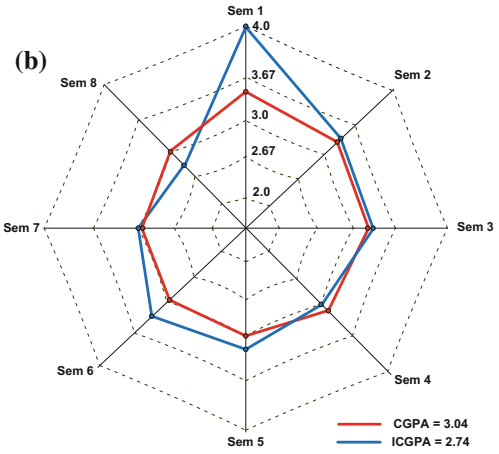

Fig. 1.6 Average student: **a** ICGPA calculation and **b** web diagram

(a)

INTEGRATED CGPA CALCULATION FOR SELECTED MODULES								
SEMESTER	SEM 1	SEM 2	SEM 3	SEM 4	SEM 5	SEM 6	SEM 7	SEM 8
PO1	65.17	50.98	72.73	75.00			44.68	66.67
PO2	65.17	48.00	69.74	57.14	48.00		40.63	55.83
PO3	69.57		65.38		68.89	49.06	62.50	63.64
PO4		44.00		61.76		58.82	44.44	66.67
PO5			72.73		50.00		56.25	66.67
PO6				52.94		78.57	60.42	66.67
PO7			66.67		62.50	66.67	64.52	66.67
PO8							57.14	
PO9					70.00		57.89	57.14
PO10			68.18	60.87		57.14		
PO11					62.50		54.55	60.00
PO12				58.33	70.00	73.77	33.33	60.00
AVE. PO	67	48	69	61	62	64	52	63
IGPA	3.00	1.67	3.00	2.67	2.67	2.67	2.00	2.67
ICGPA	3.00	1.74	2.87	2.74	2.67	2.67	2.40	2.13
GPA	2.67	2.84	2.52	1.67	2.33	2.50	2.27	2.33
CGPA	2.67	2.75	2.66	2.39	2.38	2.54	2.50	2.48

(b)

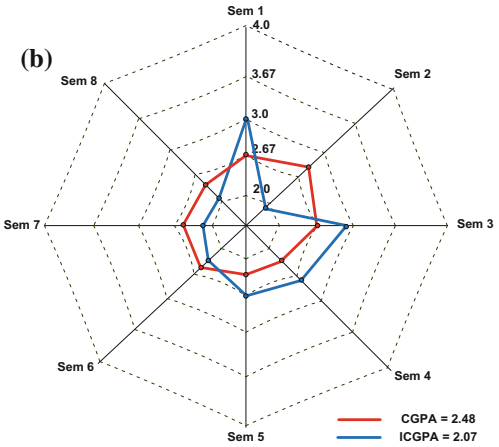

Fig. 1.7 Below average student: **a** ICGPA calculation and **b** web diagram

1.4 Conclusion

The relationship between CGPA and PO attainments was thoroughly studied using the PO model based on culminating and significant modules as suggested by OBE experts and implemented through ESAT. Two cohorts were used to give more valid results which both showed that there is no significant difference between CGPA and PO attainments. This is the case for Taylor's University; however, this result might vary from one IHL to another depending on how explicit the PO assessment process is and the IHL's practice of awarding student's grade. Since CGPA showed only the

academic performance and no direct indication of the achievement of graduate attributes, a PO certificate showing the skills attainment of the graduate is a good complement to CGPA.

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Chapter 2
Competency-Based Assessment of the Diploma in Phlebotomy Graduates: An Initial Evaluation

John Patrick B. Tadiosa

Abstract Outcomes-based education (OBE) has been recently implemented in the Philippine educational system which is aimed toward directing the focus of education into a more learner-centered approach through a set of competencies that a student must achieve by the end of the teaching–learning process. This allows better assessment of graduates and facilitates the process leading to better outcomes. This paper is designed to determine the level of achievement of the competencies of the diploma in Phlebotomy graduates as perceived by the graduates' themselves and as perceived by their training officers. From the initial evaluation made, the competencies expected from the graduates in terms of theoretical knowledge and technical skills (WM = 4.00), interpersonal skills (WM = 4.19), critical thinking and problem-solving skills (WM = 3.88), and the demonstration of professional and ethical behavior (WM = 4.09) were all achieved in general. Therefore, the curriculum program is said to be effective. On the other hand, the results of the responses of the graduates' self-assessment and the assessment made by training officers were found to be significantly different when computed statistically. Further studies should be conducted to help improve the assessment process of the curriculum program.

Keywords Phlebotomy · Outcomes-based education · Competency-based assessment

2.1 Introduction

Over the years, the Philippine educational system has adapted a variety of teaching and learning methodologies to equip graduates with the right amount of knowledge, skills, and attitudes to allow them to become productive members of the society. Recently, the country made a huge step in its educational system by adapting

J.P.B. Tadiosa (✉)
Lyceum of the Philippines University–Batangas, Batangas City, Philippines
e-mail: jptadiosa@gmail.com

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outcomes-based education (OBE), which is aimed toward directing the focus of the teaching–learning process into a more learner-centered approach (Inocian & Inocian, 2016). This output- and outcomes-driven approach has been proven to facilitate the learning process and to empower students for creating a sustainable future (De Guzman, 2016). Furthermore, this approach emphasizes that the center of the learning process is the learner itself and introduces strategic educational planning that is aimed at achieving results (Hejazi, 2011) and not simply a matter of replacing "objectives" with "outcomes" (Norman, 2006).

In the year 2013, the College of Allied Medical Professions (CAMP) at Lyceum of the Philippines University (LPU)—Batangas implemented a new curriculum program wherein the students who enrolled in the Medical Laboratory Science program should undergo a two (2)-year diploma in Phlebotomy program which is a preparatory program for the said Medical Laboratory Science program. However, a student may opt to exit the program after the initial two (2) years and obtain a diploma which they can present to their prospective future employers in securing and applying for their jobs. LPU—Batangas is the only university in the whole Philippines offering this framework of ladderized program of the Medical Laboratory Science curriculum. This program is a product of a benchmarking activity conducted wherein it has been recommended that a competency-based Medical Technology (Medical Laboratory Science) using the ladder concept may be formalized in such a way that the first two years would lead to an associate degree equivalent, hence, diploma in Phlebotomy (Valdez, 2012). A list of expected outcomes based from the curriculum map should be achieved by the graduates as they finish the two (2)-year program. Furthermore, in each phase of the curriculum, these educational outcomes should be used as the framework for assessment (Harden, Crosby, & Davis, 1999). The level of achievement of these expected outcomes as perceived by the graduates and their previous training officers should be established to determine whether the current instructional design for teaching Phlebotomy is sufficient to achieve the expected outcomes of the program.

This pilot study aims to initially establish the effectiveness of the outcomes-based instructional design utilized in the Diploma in Phlebotomy program by assessing the level of achievement of the listed competencies in the curriculum map that are expected from the graduates of Diploma in Phlebotomy based from their perception or self-assessment and from the assessment of their previous training officers. Likewise, the study aims to determine the differences in the perceptions of the graduates and training officers on the level of achievement of the expected competencies to determine if there is a gap between the school instruction and the needs of the industry. Studies show that in dentistry, the different evaluations including self-assessment and external assessment which could be done through professors' assessment may help students to improve their understanding of certain principles and improve the teaching effectiveness of education (Kirov, Kazakova, & Kirilova, 2014).

2.2 Literature Review

2.2.1 Outcomes-Based Education

Outcomes-based education (OBE) involves a complex combination of restructuring the curriculum, assessment, and reporting practices to emphasize the achievement of high-order learning and mastery. Thus, it is aimed at facilitating desired changes in the students, through the increase in knowledge, skill development, and/or positively influencing attitudes, values and judgment within the context (Mamat, 2014).

Aside from three of the most important determinants of quality education namely—effectiveness, efficiency, and sustainability, it is also important that the relevance of education is taken into consideration. This means that not only the needs of the students are addressed in the education process, but also the needs of the employers and in the industry, for that matter, should also be addressed. This will also provide the future graduates an educational experience that can be paralleled with the rest of the world (Commission on Higher Education, 2012). However, the full implementation of the said OBE curriculum remains to be a challenge since it offers fresh pedagogical approaches and therefore will also require shifting to output-oriented teaching and learning environment (Limon, 2016). As compared to conventional teaching methods, OBE provides higher grades in terms of academic performance especially when applied to sciences (Akir, Eng, & Malie, 2012) and English (Anh & Thanh, 2014).

In outcomes-based education, it is important that the competencies or performance indicators are well defined. This insures that the assessment made to students is coherent and consistent based on real-life criteria, providing opportunities to demonstrate proficiency in a specific competency and outcomes level, and therefore improving the quality of assessment (Boateng, Bass, Blaszak, & Farrar, 2009). Therefore, teachers applying OBE in their daily teaching should be well prepared which will allow them to provide students with appropriate and purposeful learning experiences so that they can maximize the fruits of learning (Killen, 2000).

2.2.2 Phlebotomy

Phlebotomy is considered as the art of drawing blood, and for many centuries, it is still considered one of the most common invasive procedures in the healthcare setting (Lavery & Ingram, 2005). However, the practice varies considerably between and among healthcare workers and may also vary among countries (Shahangian et al., 2005). These differences may include variations in blood sampling techniques, training, safety protocols and procedures, disposal system, and the availability of ample protection to healthcare workers. However, despite these differences, the phlebotomy practices must all be geared toward providing

quality care to patients by performing proper collection techniques which has an overall effect of the quality of sample being produced for laboratory testing. Therefore, it is imperative that blood collectors (phlebotomists) are well versed of the fundamentals of phlebotomy to avoid leading to inaccurate test results, leading to misdiagnosis and mistreatment of the patient (Nayal et al., 2011). Furthermore, if not performed correctly, errors resulting from phlebotomy may cause serious harm to patients be it death or a major disability. Establishing and implementing quality-control mechanisms in the process which are composed of materials and methods to promote better outcomes (Grable & Gill, 2005).

As stipulated in the writing made by Graham Ford, the fundamental principle in medical practice was greatly based on the fact that there are four body fluids or humors which are blood, phlegm, yellow bile, and black bile. It was believed that an excess of these substances results to a disease so therefore, procedures such as purging, starving, vomiting, and bloodletting (phlebotomy) are the reasonable and logical form of treatment to reverse the disease process. Even before the time of Hippocrates in 460 B.C, the art of bloodletting was already a practice. Furthermore, there were people who already specialized in this art and were known as barber surgeons during the middle ages. During the eighteenth and nineteenth centuries, the art of bloodletting became a very common practice but was declared quackery by the end of nineteenth century after an incident involving George Washington, the first US President, who died after letting nine pints of blood within 24 h (The Phlebotomy Pioneer, 2012).

According to the manual of Montgomery County Community College (2015), a phlebotomist is a member of the healthcare delivery team whose primary responsibility is collecting blood specimens from patients. These specimens are used for clinical laboratory analysis and thereby provide physicians with vital information used in making diagnoses, following progress, and treating patients. Phlebotomists are in great demand for employment in hospitals, physicians' offices or clinics, or by commercial reference laboratories. Phlebotomists must be able to collect blood competently, safely, and in a professional manner.

The art of Phlebotomy might sometimes be erroneously considered as a relatively easy task to perform, and it may bridge the gap between the patient and the laboratory. In order to attain a good grasp of the phlebotomy practice, a year of training may be necessary as this amount of training corresponds to an equivalent of close to 99% accuracy during the first attempt of blood collection. However, a phlebotomist's success is not only depicted by the number of actual performance of the procedure (Vuk, Cipek, & Jukic, 2015). With the continuous development of technology in the field of Phlebotomy, many useful devices are being developed to help in doing the process and therefore will reflect better quality of specimens collected and improve the welfare and safety of the patients. However, there is no perfect protocol that can specifically contain the right information and the right conditions in order to a phlebotomist to achieve a perfect blood draw. The efforts made in prioritizing the safety of the patients and the quality of service provided are the primary instrument which will allow the

practice of phlebotomy to serve as a link between the patients and the laboratory (Ialongo & Bernardini, 2015).

2.3 Methodology

2.3.1 Research Design

This research study utilized descriptive research design and quantitative methodology in its analysis to initially establish the level of achievement of the competencies that are expected from the graduates of Diploma in Phlebotomy based from the graduates' perception or self-assessment and from the assessment of their previous training officers during the graduates' Phlebotomy clinical practicum.

2.3.2 Respondents

The study involved 105 Diploma in Phlebotomy graduates batch 2015–2016 at Lyceum of the Philippines University. There were a total of 121 graduates for batch 2015–2016 constituting a retrieval rate of 86.78% or 105 out of 121 graduates.

2.3.3 Instrument

The study utilized the survey questionnaire method. The questionnaire was validated and approved by the dean of the program. The graduates were given a list of the expected competencies declared in the curriculum map through a survey questionnaire and were asked to rate themselves using a five-point rating scale on the level of achievement of the said competencies. Likewise, the same set of graduates was also assessed by their respective previous training officers during the graduates' Phlebotomy clinical practicum using the same list of expected competencies.

2.3.4 Statistical Analysis

The data were processed and analyzed to determine the means and were also examined to determine the differences between the responses of the graduates' self-assessment and the assessment from the training officers using independent T-test analysis.

2.4 Results and Discussion

There are four major areas to which the graduates were assessed based on the expected competencies—theoretical knowledge and technical skills, interpersonal skills, critical thinking and problem-solving skills, and the demonstration of professional and ethical behavior. All of these four (4) major areas consist of specific competencies to help both the graduates and the training officers to facilitate the overall evaluation process.

Table 2.1 shows the mean ratings of the assessment on the level of achievement of theoretical knowledge and technical skills of graduates. For the self-assessment, the graduates' ability to independently take examinations which is either written, practical, or computer was deemed highly achieved and ranked first with a weighted mean of 4.63. Likewise, the graduates' ability to safely collect, handle, and process biological specimens for testing ranked second with a weighted mean of 4.59 and therefore deemed as highly achieved. The graduates' ability to adhere to all laboratory safety rules and regulations ranked third and was also deemed as highly achieved. However, the graduates' abilities to interpret laboratory test data ranked last with a weighted mean of 3.90 and were deemed as achieved. The composite mean of 4.29 signifies that the graduates' self-assessment on their theoretical knowledge and technical skills is achieved.

From the training officers' viewpoint, the graduates' ability to independently take examinations ranked first with a weighted mean of 3.95 and was deemed as achieved. This is followed by the graduates' ability to safely collect, handle, and process biological specimens for testing with a weighted mean of 3.91. Furthermore, the graduates' ability to accurately perform laboratory testing was achieved as represented by a weighted mean of 3.80 and ranked third. On the other hand, the graduates' ability to analyze and interpret laboratory test data and their ability to carry out evaluation of new procedures and instruments ranked eighth and ninth with a weighted mean of 3.60 and 3.56, respectively, but were still both deemed as achieved. Moreover, the training officers' assessment of the graduates' theoretical knowledge and technical skills was achieved in general as indicated by a weighted mean of 3.71.

In the overall assessment of the theoretical knowledge and technical skills of the graduates, their ability to take examinations independently, their ability to safely collect, handle, and process biological specimens for testing, and their ability to adhere to all laboratory safety rules and regulations are the top three (3) competencies as indicated by the mean ratings of 4.29, 4.25, and 4.18, respectively, all of which were deemed as achieved. On the other hand, the graduates' ability to use computers and laboratory software effectively, their ability to carry out evaluation of new procedures and instruments, and their ability to analyze and interpret laboratory test data ranked the bottom three (3) with mean ratings of 3.91, 3.83, and 3.75, respectively, all of which were also deemed as achieved. Overall, the composite mean of 4.00 indicates that the level of achievement of graduates' theoretical knowledge and technical skills was achieved. However, it is noteworthy that

Table 2.1 Mean ratings of the assessment on the level of achievement of theoretical knowledge and technical skills of graduates

Competencies	Self			Training officer			Overall		
	WM	VI	R	WM	VI	R	WM	VI	R
Independently take examinations (written, practical, computer)	4.63	HA	1	3.95	A	1	4.29	A	1
Safely collect, handle, and process biological specimens for testing	4.59	HA	2	3.91	A	2	4.25	A	2
Accurately perform laboratory testing	4.29	A	4	3.80	A	4	4.04	A	4
Analyze and interpret laboratory test data	3.90	A	9	3.60	A	8	3.75	A	9
Monitor testing procedures, equipment and professional/technical competency using quality-assurance methodologies	4.25	A	6	3.61	A	7	3.93	A	6
Operate instrumentation properly and perform appropriate preventive and corrective maintenance	4.26	A	5	3.67	A	6	3.96	A	5
Adhere to all laboratory safety rules and regulations	4.50	HA	3	3.86	A	3	4.18	A	3
Use computers and laboratory software effectively	4.10	A	7.5	3.72	A	5	3.91	A	7
Carry out the evaluation of new procedures and instruments	4.10	A	7.5	3.56	A	9	3.83	A	8
Composite mean	4.29	A		3.71	A		4.00	A	

Legend 4.50–5.00 = Highly Achieved (HA); 3.50–4.49 = Achieved (A); 2.50–3.49 = Moderately achieved (MA); 1.50–2.49 = Slightly achieved; and 1.00–1.49 = Not achieved

evidence suggests that evaluating students' knowledge through practice alone may not provide an accurate assessment of their understanding and skills (Fordham, 2005).

Table 2.2 shows the mean ratings of the assessment on the level of achievement of the expected interpersonal skills of graduates. From the graduates' self-assessment, their ability to instruct patients clearly prior to specimen collection ranked first with a weighted mean of 4.57 and was deemed as highly achieved. This is followed by graduates' ability to follow verbal and written instructions with a weighted mean of 4.53 and was deemed as highly achieved. Furthermore, the graduates' ability to communicate with other professionals both verbally and in writing with a weighted mean of 4. 37 ranked last and was deemed as achieved. The

Table 2.2 Mean ratings of the assessment on the level of achievement of interpersonal skills of graduates

Competencies	Self			Training officer			Overall		
	WM	VI	R	WM	VI	R	WM	VI	R
Follow verbal and written instructions	4.53	HA	2	3.96	A	1	4.25	A	1
Communicate with faculty members, fellow students, laboratory staff, and other healthcare professionals both verbally and in writing	4.37	A	3	3.84	A	2.5	4.10	A	3
Instruct patients clearly prior to specimen collection	4.57	HA	1	3.84	A	2.5	4.20	A	2
Composite mean	4.49	A		3.90	A		4.19	A	

Legend 4.50–5.00 = Highly Achieved (HA); 3.50–4.49 = Achieved (A); 2.50–3.49 = Moderately achieved (MA); 1.50–2.49 = Slightly achieved; and 1.00–1.49 = Not achieved

level of achievement of the interpersonal skills from the graduates' own point of view is achieved in general as represented by a weighted mean of 4.49.

On the other hand, according to the training officers, the graduates' ability to follow verbal and written instructions ranked first as represented by a weighted mean of 3.96 and was deemed as achieved. Both the graduates' ability to communicate with other professionals and the ability to instruct patients clearly prior to specimen collection obtained a weighted mean of 3.84 and were both deemed as achieved. The composite mean of 3.90 indicates that the graduates' interpersonal skills were achieved as perceived by the training officers.

In the summative assessment of the level of achievement of interpersonal skills of graduates, their ability to follow verbal and written instructions ranked first with a mean rating of 4.25 and was deemed as achieved. The graduates' ability to instruct patients clearly prior to specimen collection ranked second with a mean rating of 4.20. Lastly, the graduates' ability to communicate with other professionals ranked last with a mean rating of 4.10. Overall, the level of achievement of the interpersonal skills of graduates, as indicated by a weighted composite mean of 4.19, was achieved. Therefore, the graduates are able to communicate effectively with the hospital staff, their colleagues, and especially to their patients. Therefore, the graduates were able to recognize problems inside the laboratory and be able to solve them efficiently while applying the basic principles and techniques used in various laboratory processes.

The mean ratings of the assessment on the level of achievement of critical thinking and problem-solving skills are shown in Table 2.3. For the self-assessment, the graduates' ability to generate and evaluate the validity of the data and assure its reliability in patient care ranked first with a weighted mean of 4.28 and deemed as achieved. This is followed by the graduates' ability to

Table 2.3 Mean ratings of the assessment on the level of achievement of critical thinking and problem-solving skills of graduates

Competencies	Self			Training officer			Overall		
	WM	VI	R	WM	VI	R	WM	VI	R
Generate and evaluate the validity of the data and assure its reliability in patient care	4.28	A	1	3.57	A	1	3.92	A	1
Recognize errors and the ability to integrate and interpret analytical data and establish a course of action to solve problems	4.13	A	4	3.56	A	2	3.85	A	2
Recognize and identify problems then take appropriate corrective action	4.14	A	3	3.49	MA	3	3.81	A	4
Demonstrate administrative skills consistent with philosophies of quality assurance, continuous quality improvement, laboratory education, fiscal resource management, and appropriate composure under stressful conditions	4.18	A	2	3.47	MA	4	3.82	A	3
Composite mean	4.18	A		3.57	A		3.88	A	

Legend 4.50–5.00 = Highly Achieved (HA); 3.50–4.49 = Achieved (A); 2.50–3.49 = Moderately achieved (MA); 1.50–2.49 = Slightly achieved; and 1.00–1.49 = Not achieved

demonstrate administrative skills with a weighted mean of 4.18 and deemed as achieved. Moreover, the graduates' ability to recognize errors and ability to integrate and interpret analytical data and establish a course of action to solve problems ranked last with a weighted mean of 4.13 but was still deemed as achieved. Furthermore, from their own perception, a composite mean of 4.18 indicates that the graduates' critical thinking and problem-solving skills were achieved.

With regard to the training officers, the graduates' ability to generate and evaluate the validity of the data and assure its reliability in patient care ranked first with a weighted mean of 3.57 and deemed as achieved. This is followed by the graduates' ability to recognize errors and the ability to integrate and interpret analytical data and establish a course of action to solve problem as represented by a weighted mean of 3.56 and was also deemed as achieved. However, the graduates' ability to recognize and identify problems then take appropriate corrective action and the demonstration of administrative skills were moderately achieved as represented by the means 3.49 and 3.47, respectively. A composite mean of 3.57 indicates that from the training officers' point of view, the graduates' critical thinking and problem-solving skills were achieved.

Overall, in terms of the level of achievement of the graduates' critical thinking and problem-solving skills, their ability to generate and evaluate the validity of the data and assure its reliability in patient care ranked first with a weighted mean of 3.92 and was deemed as achieved. This is followed by the graduates' ability to recognize errors and the ability to integrate and interpret analytical data and establish a course of action to solve problems with a weighted mean of 3.85 and was also deemed as achieved. The graduates' ability to recognize and identify problems then take appropriate corrective action ranked last with a weighted mean of 3.81. The resulting composite mean of 3.88 indicates that the graduates' ability to think critically and exhibit problem-solving skills was achieved.

Table 2.4 presents the mean ratings of the assessment on the level of achievement of the demonstration of professional and ethical behavior of graduates. The graduates' ability to maintain confidentiality of patient's test results ranked first with a weighted mean of 4.60 which is followed by the graduates' ability to apply principles of educational methodology with a weighted mean of 4.50, both of which were deemed as highly achieved. Finally, the ability of the graduates to apply principles of management ranked last with a weighted mean of 4.41 and was deemed as achieved. A composite mean of 4.50 indicates that the graduates' self-assessment on the demonstration of professional and ethical behavior was highly achieved in general.

From the training officers' assessment, the maintenance of confidentiality of patients test results by graduates ranked first with a weighted mean of 3.78 and was deemed as achieved. This is followed by the graduates' ability to apply principles of management and ability to apply principles of management with a weighted mean of 3.69 and 3.54, respectively, and both of which are deemed as achieved. The resulting composite mean of 3.68 indicates that the training officers' assessment on the demonstration of professional and ethical behavior of graduates was achieved.

In the overall assessment of the graduates' level of achievement of the demonstration of professional and ethical behavior, their ability to maintain confidentiality of patients' test results ranked first with a weighted mean 4.19 and

Table 2.4 Mean ratings of the assessment on the level of achievement of demonstration of professional and ethical behavior of graduates

Competencies	Self			Training officer			Overall		
	WM	VI	R	WM	VI	R	WM	VI	R
Maintain confidentiality of patients test results	4.60	HA	1	3.78	A	1	4.19	A	1
Apply principles of educational methodology	4.50	HA	2	3.69	A	2	4.10	A	2
Apply principles of management	4.41	A	3	3.54	A	3	3.98	A	3
Composite mean	4.50	HA		3.68	A		4.09	A	

Legend 4.50–5.00 = Highly Achieved (HA); 3.50–4.49 = Achieved (A); 2.50–3.49 = Moderately achieved (MA); 1.50–2.49 = Slightly achieved; and 1.00–1.49 = Not achieved

deemed as achieved. The graduates' ability to apply principles of educational methodology ranked second with a weighted mean of 4.10 and deemed as achieved. Furthermore, the graduates' ability to apply principles of management ranked last with a weighted mean of 3.98. The overall composite mean of 4.09 corresponds to the fact that the overall demonstration of the graduates' professional and ethical behavior was achieved.

The differences in the responses of the graduates' self-assessment and the training officers' assessment on the expected competencies are shown in Table 2.5. In terms of the theoretical knowledge and technical skills, interpersonal skills, critical thinking and problem-solving skills, and the demonstration of professional and ethical behavior, there was a highly significant difference (as indicated by the p value of 0.000 which is less than the cutoff value of 0.05) observed in the responses between the graduates' self-assessment and the assessment made by the training officers among all the competencies.

There are many factors that can be attributed to the resulting difference in the responses. The assessment process may at least partially be dependent on the reviewer's expertise and familiarity with an individual's work and role expectations (Gopee, 2001). It is important that the industry are well versed of the expected competencies since competency-based education Training (CBET) aims to prepare students more effectively for real workplaces, which means that the requirements of companies and industry should be taken into account (Ayonmike, Okwelle, & Okeke, 2014).

There may be a need to do the actual assessment of the graduates after undergoing a postgraduate training program since fresh graduates maybe given the notion of not having enough working experience and the industry has reasonably higher standards than educational institutions although studies may need to be conducted to prove its truthfulness. However, the competency-based approach has stimulated beneficial changes in many postgraduate clinical training programs. Competency-based programs have a strong focus on outcomes and at the same time recognize and emphasize the relevance of the workplace with respect to both learning and assessment. (Mook, Bion, Vleuten, & Schuwirth, 2010).

In a research study conducted on Master of Public Administration (MPA) graduates, based from the initial competency data, not all students are demonstrating the needed competencies as public-service leaders as defined by the program. Therefore, while putting in mind that 100% of the competencies may not

Table 2.5 Difference in the mean ratings of the self-assessment of graduates and the assessment by training officers on the expected competencies

Competencies	F-value	p value	Interpretation
Theoretical knowledge and technical skills	7.837	0.000	Highly significant
Interpersonal skills	7.621	0.000	Highly significant
Critical thinking and problem-solving skills	8.009	0.000	Highly significant
Professional and ethical behavior	30.754	0.000	Highly significant

Legend Significant at p value <0.05

really become attainable, the initial competency data have raised concerns and excitement among the faculty members to make considerable changes in the course content in order to provide higher probability of attainment and become successful in meeting the competencies. These natural tensions serve as guide to institutionalize competency-based learning (Rivenbark & Jacobson, 2015). Likewise, these existing essential tensions between the goals of the academic institutions and the service providing sectors must be recognized and be taken into consideration in creating, developing, and updating the curricula and the assessment criteria. If not, this will make the professional competencies be deemed as both unrecognizable and meaningless (Jefferies, Chen, & Conway, 2012).

Therefore, the industry sector recognizes the need to collaborate with the educational institutions to improve the development of man power. The industries want the academe to reach out and build partnerships with them to enhance the overall teaching and learning environment. They are interested to explore other mutually beneficial partnerships through faculty immersion, designing relevant curriculum and instruction, research projects, resource sharing, and other avenues that ultimately enhance acquired knowledge and skills of students, aside from simple creating tie-ups for on-the-job training (OJT). Furthermore, industry–university interaction must be deemed a main stream activity by both partners. As in the case of the engineering profession, the fast-paced technological development entails engineering education paradigm shift that should capture the many intersections between the spheres of activity of industry and university. It is also emphasized that a structured and institutionalized relationship between the two entities is not only desirable, but is also essential for the overall success of the teaching–learning process (Roque, 2015).

2.5 Conclusions

The research aimed to determine the level of achievement of the competencies of the diploma in phlebotomy graduates as perceived by the graduates' themselves and as perceived by their training officers. From the initial evaluation made, the competencies expected from the graduates in terms of theoretical knowledge and technical skills, interpersonal skills, critical thinking and problem-solving skills, and the demonstration of professional and ethical behavior were all achieved in general. Therefore, the curriculum program was found to be effective. In a study conducted in a Medical Laboratory Science program in the Philippines, the objectives of the six-month training program embedded in the curriculum were realized to a moderate extent only (Valdez et al., 2012).

On the other hand, the results of the responses of the graduates' self-assessment and the assessment made by training officers were found to be significantly different when computed statistically. On the other hand, the results of the responses of the graduates' self-assessment and the assessment made by training officers were found to be significantly different when computed statistically. These results are attributed

to a variety of factors and may not necessarily reflect a gap in the school instruction since the competencies across all four (4) major areas were verbally interpreted as achieved based from either the students or training officers' perspective.

Further studies should be conducted which could be in the form of needs analysis and training officer's expectations from trainees to further narrow the gap between the school instructional design and the needs of the industry. Likewise, further studies should also be conducted on the literacy on assessment of training officers to determine their suitability in providing assessments to graduates and emphasize the possibility of using industrial-based assessment tools aside from typical educational tools. It may be necessary to improve assessor performance by increasing essential communication and training and develop multiple strategies for the collection and recording of competency assessment rather than "one-time" assessments.

Likewise, it is also important to develop a variety of feedback mechanisms designed to measure the level of achievement of the program competencies that may exist in various forms and may also be used in different levels of competency achievement and to greatly obtain a comprehensive evaluation of the graduates. The results from which may be analyzed to identify areas and sectors of the curriculum and instructional design that could be improved.

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Chapter 3
Redesigning Massive Open Online Courses (MOOCs) Based on Lecturers' Perception

Sukhminder Kaur, Wei Wei Goh and Pei Gee Kng

Abstract The emergence of Massive Open Online Courses (MOOCs) has created a significant interest from the higher education institutions. The purpose of this study is to explore the lecturers' perceptions toward using MOOCs as their teaching method based on Technology Acceptance Model (TAM). This research explores how the perceived usefulness and perceived ease of use affect the actual use of MOOCs for teaching. Qualitative research has been conducted to investigate the perception of lecturers in using MOOCs. Findings have revealed the main concern of lecturers toward using MOOCs as a teaching tool and how MOOCs can be redesigned to achieve greater social impact. The study has laid a valuable foundation of knowledge on the current state of MOOCs in higher education, especially in the MOOC design and implementation.

Keywords Technology Acceptance Model · MOOC

3.1 Introduction

Massive Open Online Courses (MOOCs) are a free Web-based distance learning program that is designed for the participation of large numbers of geographically dispersed students (Barnes, 2013). The background of this research is on the perception of lecturers toward Massive Open Online Courses (MOOCs) in education nowadays. Today, blended learning is commonly adopted compared to traditional face-to-face methods. MOOCs present a new option for blended course

S. Kaur (✉) · W.W. Goh · P.G. Kng
Taylor's University, Subang Jaya, Malaysia
e-mail: Sukhminder.Kaur@taylors.edu.my

W.W. Goh
e-mail: weiwei.goh@taylors.edu.my

P.G. Kng
e-mail: kngpeigee@gmail.com

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design. Instead of "flipping" one's course by producing online lecture videos or leveraging textbooks, instructors can "wrap" their courses around existing MOOCs (Caulfield, 2012).

3.1.1 Background

There are a lot of challenges in MOOCs. Hence, this research will look into the lecturers' perception in using MOOCs as the learning method by using Technology Acceptance Model. In this research, it will gather all the information about Technology Acceptance Model (TAM) that will be used as the theoretical framework to investigate the response of the lecturers in using MOOCs as a teaching tool.

3.1.2 Objective

The main objective of this study is as follows:

1. Explore the lecturers' perception toward Massive Online Open Courses (MOOCs) as a teaching tool.
2. Investigate issues faced by the lecturers when using MOOCs.
3. Recommend how to improve the design and implementation of MOOCs.

The next section explains the literature review on MOOCs and TAM. This is followed by the explanation of data collection and data analysis in this study. The preliminary findings of this research are presented followed by discussion and recommendation.

3.2 Literature Review

3.2.1 Massive Open Online Courses (MOOCs)

Massive Open Online Courses (MOOCs) are defined as taking a course anytime and anywhere around the globe (Peterson, 2014). There is no limit in the number of students in the course. The concept of openness in education has been evolving rapidly since 2000, although it has its origins in the early twentieth century (Peters, 2008). Two institutions represented in the ongoing development of the open education movement, namely Massachusetts Institute of Technology (MIT) and Open University. MIT established the OpenCourseWare in 2002 and the Open University set up OpenLearn in 2006. This online course was initially designed for a group of 25 students but was opened up to be registered worldwide. The original aim of

MOOCs was to provide free access to many students as possible (Yuan & Powell, 2013). There are two key features in MOOCs: (1) open access—anyone can participate in an online course for free; (2) scalability—courses are designed to support an indefinite number of participants (DeSantis, 2012).

Commonly, MOOCs planned to achieve modest and measured forms in education. Students are required to have a computer or mobile device to access the course. There are no charges in fees and no entry requirements required. Students are learning from each other and grading each other's work (Baggaley, 2013).

Massive Open Online Courses (MOOCs) have an open registration online course with a publicly shared curriculum. MOOCs integrate social networking, accessible online resources and is facilitated by a group of leading practitioners in the field of study. Most significantly, the fundamental rule of MOOCs is the engagement of learners who self-organize their participation according to learning goals, existing knowledge, skills, and common interest. MOOCs have attracted a diverse group of learners from all age groups from over hundreds of countries around the world (Downes, 2012).

Different learning theories have driven MOOCs into two distinct pedagogical directions: the connectivity MOOCs (cMOOCs) which are based on a connectives theory of learning with networks developed informally; and content-based MOOCs (xMOOCs), which follow a more behaviorist approach (Talbert, 2003). cMOOCs emphasize connected, collaborative learning, and the courses are built around a group of like-minded "individuals" who are relatively free from institutional constraints. cMOOCs provide a platform to explore new pedagogies beyond the traditional classroom. On the other hand, the instructional model (xMOOCs) is essentially an extension of the pedagogical models practiced within the institutions themselves, which is arguably dominated by the "drill and grill" instructional methods with video presentations, short quizzes and testing. A further division of xMOOCs into two models can be identified: profit and nonprofit to serve different purposes (edX, 2013).

In Malaysia, the higher education institutions and the government plans to attract more international students to Malaysia in making it a regional educational hub. Several MOOCs have been introduced in Taylor's University. More than hundred students have registered for the Entrepreneurship course offered to engineering students in their second year of the undergraduate program. The program offered is over a 14-week semester and include a series of lectures. The course also features a variety of assessment. This module is offered as MOOC and started on March 27, 2013 (Mushtak, 2014). According to Goh et al. (2015), students agree that MOOCs are useful in their learning and have helped them to improve their learning. They are satisfied with MOOCs.

OpenLearning platform is the MOOC platform used by the lecturers in this study. OpenLearning provides many social-media-like features such as forums to enable students to comment and encourage interaction while learning (Vardi, 2012). OpenLearning has other interesting features such as karma points, which are gained via obtaining positive comments from peers and badges that can be issued either automatically or when a certain learning goal is achieved.

3.2.2 *Technology Acceptance Model (TAM)*

TAM, acronym of Technology Acceptance Model, is a model introduced by Davis (1989) and its successors (Venkatesh, Morris, Davis, & Davis, 2003). It focuses on psychological and attitudinal antecedents in the usage of technologies. The Technology Acceptance Model influences the behavioral outcome and individual choice to use the technology. It focuses largely on the decision to adopt a technology and subsequently use it. With growing technology needs and increasing failures of system adoption in organizations, predicting system use became an area of interest for many researchers. However, most of the studies carried out failed to produce a reliable measure that could explain system acceptance or rejection (Davis, 1989). In 1985, Fred Davis proposed the Technology Acceptance Model (TAM) in his doctoral thesis at the MIT Sloan School of Management (Davis, 1986). David suggested in his proposal that users' motivation can be divided into three factors: Perceived Ease of use, Perceived Usefulness, and Assertiveness toward using the system. He hypothesized that the assertiveness was a major determinant whether to use or reject the system. The assertiveness is to be influenced by two major beliefs: perceived usefulness and perceived ease of use, with perceived ease of use having a direct incline by the system design characteristics.

In general, Perceived Usefulness (PU) has been defined as the degree to which a person believes that using a particular system would enhance his or her job performance; while Perceived Ease of Use (PEOU) has been defined as the degree to which a person believes that using a particular system would be free from effort (Davis, 1989).

David (1989) suggested the initial prediction, perceived usefulness could have direct influence on the actual system use. At the same instance, found that system characteristics could directly influence the attitude of a person toward using the system as shown in Fig. 3.1.

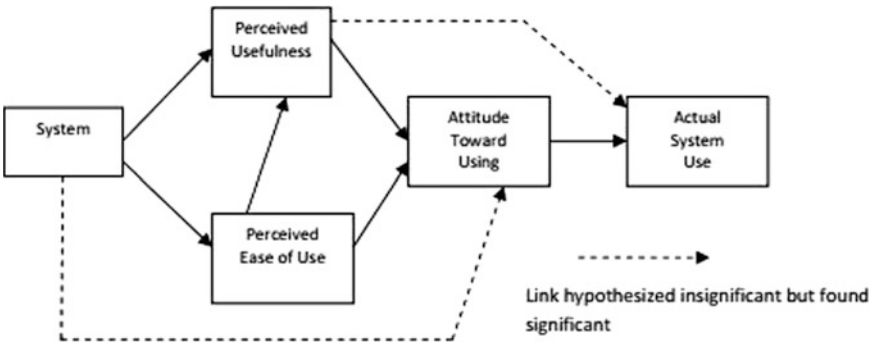

Fig. 3.1 Technology acceptance model

3.3 Research Methodology

3.3.1 Data Collection and Data Analysis

Qualitative approach was conducted to explore the perception of lecturers in using MOOCs for teaching. Semi-structured interview questions were designed based on Technology Acceptance Model (TAM). The benchmarks for choosing the participants were based on their experience in using MOOCs for teaching. Semi-structured interview was conducted with five lecturers in this study. Before an interview, an e-mail was being sent to the targeted lecturers to request for the permission for interview and arrange the available time slot for them to be interviewed. When they reply indicating that they agree to participate in this interview, the time and venue will be agreed by both parties, the lecturers and the author to ensure no issue of miscommunication. During the interview, permission was obtained by letting the interviewees to sign the consent form. Besides the permission to conduct the interview, their permission to use a recorder was obtained.

The interview questions were broadly divided into two categories:

(1) identify the perception of lecturers in using MOOCs;
(2) investigate the issues arising when lecturers use MOOCs.

Questions like years of teaching experience, teaching method used will be asked before the real in-depth question begins. If the lecturers answer yes, there will be a section of questions regarding MOOCs while if the lecturers answer no, question like why not will be asked to get the opinion of the lecturers. The interview lasts around 20–30 min.

As for data analysis, the research data comprised transcripts of interviews with five lecturers. The data were analyzed simultaneously during data collection and interpretation. Thematic analysis was performed on all the transcripts to analyze the perception of lecturers in using MOOCs. Results of the interviews can be seen clearly and will be elaborated in the next section.

3.3.2 Results

A total of five lecturers were interviewed who are the users of OpenLearning platform. Three lecturers have over 10 years of teaching experience. They used MOOC for learning and are currently using MOOC as the teaching platform. One of the lecturers commented that he had used MOOC for learning when he was a student two years ago. He spends 5–6 months to design his own course in MOOC. There were three lecturers who have just started using MOOC within this year. These lecturers design MOOC based on their module learning structure and learning objectives. E-learning academic (eLA) of the university helps them with the content design and recording.

3.3.2.1 Perceived Usefulness (PU)

The lecturers find that MOOC is a good teaching platform. When asked about the usefulness of MOOC, they think that MOOC provides a platform to upload lecturer's videos. Students can pause the videos and watch them repeatedly. One lecturer mentioned that the quality of the videos and the interactive features of the videos are very important. One lecturer says, "I plan the course, read the script and record it as an MP3 voice file. I use a software called Sparkol to do lecture videos, to record my own voice." However, for some topics, the students still prefer to attend face-to-face class.

When the lecturers were asked about this question, "Do you think that the explanation or solution given in MOOC is more useful than the explanation which you give in class?" One of the lecturers thinks that either the explanation in MOOC or the explanation in class can exist independently, he says, "Maybe hybrid learning is better. I will suggest a 12-week module and I will meet students for 5 weeks." Some students are shy to ask in class, so they can ask in the MOOC, and for those students who have not got full understanding of the explanation, they can ask in class. Some lecturers think that the discussion in MOOC is more useful than the actual discussion group in class. One of the lecturers expressed that, "Yes, the discussion in MOOC is useful. For certain MOOC which has hundreds of comments made by both lecturers and students, it seldom happens in class. The discussion group has a very interactive comment session, so I think it is useful for students." Furthermore, one lecturer mentioned that the discussion in MOOC is useful because it has overcome the barriers of the time zone and not only the lecturer himself can provide answers to the questions. All people who are in the MOOC can learn from the answers. The quality of the answers in MOOC is even better than the answers given in class. This is because MOOC has many students from all over the world, and there are many global students with different backgrounds, some of them are from Australia, some of them are professionals, so diverse answers are actually better than what they have in class. When they were asked about the reliability of the answers provided on MOOC, one of the lecturers indicated that, "We discuss on the discussion forum. We post the question, and the facilitator will also give the answer, so as long as the facilitator is there, I think the answer will be reliable."

In terms of perceived usefulness, MOOC is useful for students as it is open to everyone. MOOC can reach out to people who are not able to study because of financial or time constraints. MOOC has overcome the barriers of time zone too.

The usefulness of MOOC was experienced by those students who had completed their course and have interest in MOOC. According to one of the lecturers, there might be only 4% of students who had completed the course. The main reason is because MOOC has no attendance system, and it is completely open to anyone who has interest in a certain course. As long as it is free, no one will take it seriously, and only those who have interest in the course will complete the course. As such, MOOC is useful for students who have interest in studying on their own and engage

with the course content well. There are students who actually have 100% of completion rate in the course, depending on the interest of students. If the session has met with their expectations, the productivity will be consistent.

3.3.2.2 Perceived Ease of Use

The lecturers were asked about their perception on the ease of use of MOOC. Out of the five lecturers, one of the lecturers actually thinks that the OpenLearning platform is not user-friendly where his students were confused and did not know where to start when using MOOC. The rest of the lecturers think that the OpenLearning platform is user-friendly. One lecturer expressed that, "OpenLearning is the best; it allows you to build the community. Students can form groups in OpenLearning." One of the lecturers stated that MOOC is very easy to use and he understood the whole MOOC structure within 1 week.

The question then led to "Do you think MOOC requires a lot of mental effort from the students before engaging with it? One lecturer indicates that, "For the younger generation, who have been exposed to social media for a long time, will find it easy, but for those who never access to social media like this, they might need some guidance, but the most I see, the tools are very intuitive, so I think the students don't really need that much of mental effort while using."

Another lecturer said that he actually has students who felt very confused when they first approached this MOOC, and he would suggest them to chat online with him after they have created the account and enrolled in his course. He will instruct his students on what to do. He indicates, "I think MOOC requires some mental effort from students before they start engaging with it but they still consider it very easy." One lecturer responded that it actually depends on the designer of the course. They must give complete and clear instructions to students before they start to use it. One of the lecturers expressed that, "For the length of the videos, research has shown that that people can only concentrate for 6–12 min, so I think the length of the videos in lecture should not exceed that." Another lecturer commented that his video is around 15–20 min which was actually the concise version of his one-hour lecture.

The last question asked to the interviewees is whether they think that the discussion is more effective in MOOC rather than in class. One lecturer responded, "Yes, because students can share their ideas, especially when the MOOC has students from different backgrounds, but in terms of effectiveness, face-to-face will be better." According to another lecturer, "My way is, my discussion is on my twitter, I switch on my account from 9 pm to 10 pm for students to ask questions, and then I will go to YouTube streaming to answer the questions. It is almost like face-to-face. But the only problem is the students must be available at that time." Another lecturer expressed that his students prefer MOOC which has a chat room system that can allow five or six students in the same group to discuss.

Students find MOOC easy to use, especially for those who are familiar with the social media or who have experience in using MOOC. Most of the lecturers do not require a lot of mental effort to understand how MOOC works. In conclusion, the lecturers' perceptions show that MOOC shows a positive sign in terms of both the usefulness and the ease of use.

3.4 Discussions and Recommendations

In this study, the lecturers' perception toward using MOOC as their teaching tool has been discussed. The problem with MOOC now is there is no constant participation in MOOC. The attrition rate is high. Hence, students get terminated in the program if he/she does not fulfill the requirements to meet the due date, and he/she cannot participate anymore. But on the other hand, if the system does not terminate their account, once they stop for 5 weeks and come back at 6th week, they are not able to catch up with others' work. It is recommended to have a collaboration between the university and MOOC. The facilitator should mark the assignments for the students so that the participation can be consistent and students will take it seriously.

The design of MOOC should show a brief idea of the course content so that the students have some idea what is the course about before they enroll. Subscription and un-subscription function can be added for each course to allow students to quit the course if the course does not meet their expectations. This will lower the failure rate of MOOC. Another suggestion is to have more social interactive activity for students. Chatroom feature can be created for students to have live chat and have their own discussion rather than discussing in public. The administrator can encourage more students to collaborate among their peers and work in groups.

3.5 Conclusion

Based on the results obtained, although there are some minor problems faced by the lecturers when using MOOC, the problems will not directly affect the teaching experience of lecturers. Administrators may need to put some effort into the improvements of the platform in order to provide a better learning environment for the students.

Overall, the lecturers find that MOOC is useful for teaching. The limitation of this research was mainly time constraint. More lecturers from different courses could have been interviewed to gather more comprehensive and detailed findings. The future research can also focus on the introduction of MOOC in primary school and secondary school which may benefit the students in a good way too. In addition, MOOC not only can be used as the platform for education, but can also be used in different industries such as business, engineering, and so on.

In conclusion, the authors have successfully gathered the perceptions of the lecturers toward using MOOC for teaching through interviews. Furthermore, issues arise and recommendations have been discussed in this study. The study has laid a valuable foundation of knowledge on the current state of MOOCs. This research project has fulfilled the objectives, and the authors think that the result of this research may contribute to the future implementation of MOOC in higher education institutions.

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Chapter 4
Service Quality of Higher Education Institution Among Its International Students: Inputs to Competitive University Image

Reynalda B. Garcia, Norma L. Menez, Bella Luz Dinglasan and Bernardo Hornilla

Abstract The Lyceum of the Philippines University—Batangas, an autonomous university in the Philippines seeks to examine its competitive and strategic advantage through evaluating its services to International students in order to determine its university position in the competitive educational market. Using the descriptive method of research employing both the qualitative and quantitative approaches, this study seeks to achieve the following objectives: To measure how satisfied are the International students to the services provided by the university's executive, finance, institutional division, student services, and outsourced services. Findings revealed that international students are generally very highly satisfied with majority of the services offered. The researchers draw inputs based on the results of the study to strategically position the university in the academic business environment and continuously offer quality services toward optimum customer satisfaction of international students to insure sustainability and competitive advantage.

Keywords Service quality · Strategic position · Competitive advantage · Sustainability · Academic business environment

4.1 Introduction

Based on the records of the Bureau of Immigration Statistics, international students in the Philippines have doubled its number from 26,000 in 2011 to more than 61,000 in 2012. Such remarkable growth could be partly credited to the number of accredited institutions authorized to admit foreign students thus from 104 schools and learning institutions in 2011 it became 2145 in 2012.

R.B. Garcia (✉) · N.L. Menez · B.L. Dinglasan · B. Hornilla
Subang Jaya, Malaysia

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Higher education institutions (HEIs) sector is now considered as important as other sectors of the economy. Competition is now increasing within the educational sector thus as researchers and academicians, there are new challenges set by the stakeholders emphasizing their attention toward a competitive university positioning. Quality of service of educational institutions is a key determinant for customers before purchasing a product or availing any type of service that plays significant role in measuring the performance of product/service and the organization which is parallel to education sectors (Archambault, 2008).

However, to achieve university position among other higher education institutions, they are required to focus on service quality specifically due to the ballooning number of international students. Therefore, universities to examine its competitive and strategic advantage through evaluating its services to International students in order to determine its position in the competitive educational market. In the words of Nadiri, Kandampully, and Hussain (2009, p. 525), "if service quality is to be improved, it must be reliably assessed and measured"; therefore, a reliable and valid instrument for measuring service quality of higher education from the students' perspective is indispensable.

Lyceum of the Philippines University in Batangas City in its vision to be an academically excellent provider of higher learning believes that quality of service is a parameter of student's satisfaction. The service quality is not only essential and important, but it is also an important parameter of educational excellence.

4.1.1 Objectives of the Study

The purpose of the study was to draw inputs from the results of the study to strategically position the university in the academic business environment and continuously offer quality services toward optimum customer satisfaction.

4.2 Methods

Descriptive method was used to determine the service quality provided by Lyceum of the Philippines University in Batangas. As an exploratory research, it has its objective of gathering preliminary information among 37 International students enrolled during second semester of 2015–2016. This represents 100% international students as British 2, Eritrean (East Africa) 5, US Citizen 2, Somalian 1, Indian 2, Nigerian 19, Angolan 3, Papua New Guinean 1, and Zimbabwean 2. Irrespective of course and country of origin, they are all required to submit themselves to this institutional survey.

Instead of using the generic SERVQUAL framework, the researchers used the higher educational service quality (HESQUAL) dimensions patterned to the quality attributes developed by Teeroovengadum, Kamalanabhan, and Seebaluck (2016)

Table 4.1 Summary table for satisfaction level of international students

Services by division	Weighted mean	Verbal interpretation	Rank
1. Academics and research division	4.67	VH satisfied	1
2. Facilities services division	4.54	VH satisfied	3
3. Finance division	4.57	VH satisfied	2
4. Student services division	4.56	VH satisfied	4
5. Outsourced services	4.46	VH satisfied	5
Composite mean	4.56	Very highly satisfied	

Legend 3.5–4.00 = Very highly satisfied/much satisfied; 2.50–3.49 = Satisfied; 1.50–2.49 = Dissatisfied/less satisfied; 1.00–1.49 = Need to improve the services

specifically for the Mauritian higher education sector. This higher educational service quality (HESQUAL) has five main themes divided into functional and technical aspect of higher educational service quality. The functional service quality aspect consists of administrative quality, physical environment quality, core educational quality, and support facilities quality. The technical aspect of service quality is conceptualized as transformative quality (Harvey and Green, 1993) and consists of a unidimensional construct.

To suit the present Locale University, this was modified based on the inputs of the EVP, AVP, Dean, department heads, Research and Statistics Office, and Quality Assurance and Planning Office as such that dimensions on the services delivered by each division are being accounted for.

This questionnaire is an automated customer service measurement survey program which is confidential which can only be accessed by bona fide students of LPU. As to answering of questionnaire, the International students were scheduled for an online survey for the services offered to them. This was facilitated by the Quality Assurance Office after which results were generated from the Management Information System (MIS) and then tabulated by the office of the Center for Research and Development. The data was gathered, analyzed, and subjected to statistical tools as frequency and weighted mean (Table 3.1).

4.3 Results and Discussions

The International students of Lyceum of the Philippines University are very highly satisfied on the services rendered to them by the Academics and Research Division (4.67), Facilities/Services Division (4.54), Finance Division (4.57), Student services (4.56), and Outsourced services. They claimed they are generally contented and happy with the services provided by these offices.

On the other hand, there are still offices which need to improve their services with respect to indicators on areas as attitude of the dean, department chair, faculty adviser and office staff, enrollment processing, accuracy and timeliness in the release of grades, and responsiveness to customer feedbacks, complaints, and

concerns. There is a different results for Mauritian students that this core educational quality theme, namely attitude and behavior of academics and competence of academics, are those obtaining the best rating from students (Teeroovengadum et al., 2016).

For Outsourced, there are still rooms for improvement on the rating for Canteen, Security Services—LIMA Campus and School Uniform services for the main campus. Just the same with other researches conducted in three different countries, UK, Australia, and Sweden. In Lyceum of the Philippines University, international students just like customers of institutions are very much concerned with how services are delivered and most importantly the impact on curriculum improvement initiatives, subjects' responsiveness to the needs of the industry, safe working facilities, information dissemination about formulation and implementation of relevant policies rules and regulations and on the efficiency and effectiveness of services producing desired results.

Being one of the Autonomous Universities in the Philippines, this result may affirm the claimed that positive perceptions of service quality has significant influence on student satisfaction (Alves & Raposo, 2010). In the study conducted in three different countries, UK, Australia, and Sweden, Lagrosen et al. (2004) identified factors on service quality dimensions as corporate collaboration, information and responsiveness, courses offered, campus facilities, teaching practices, internal evaluations, external evaluations, computer facilities, collaboration, and comparisons.

The contended and satisfied international students served as an inspiration from both academic performance as well as the administrative efficiency of the university. As posted by Ahmed et al. (2010), service quality is a key performance measure in educational excellence and is a main strategic variable for universities to create a strong impact perception and university competitiveness. The efforts of the university to meet the needs of international students even exceed social impact as they claimed LPU as their second home. Positioning Lyceum as a university is also promoting its reputation of excellence in the academic community. As it provides and delivers the highest quality product and service among international students is indeed creating a position in which their academic products and services are delivered to its excellent expectation of the customers.

While higher learning institutions like LPU needs to strategically position in academic business environment; service quality toward satisfying international students require them to continuously improve their present services and ensure its sustainability in attracting more foreign enrollees and international tie-ups. Based on the results of this research, it is an inspiration that quality services provided by higher education institutions are paralleled with the kind of satisfaction level and the learning experiences provided during their stay in the university.

For International students, their positive campus experiences to various offices reflect the institutional quality provided by their present university, Lyceum of the Philippines in Batangas City. Therefore, this is the same thought of Elliot and Healy (2001) that higher education institutions must not only deal with students' social values, capabilities, and skills but also their campus life experiences which can be

best expressed from the kind of caring academic and nonacademic staff, comfortable environment, adequate facilities, and resources that students whether international and local deserved in competitive university.

4.3.1 Inputs to Competitive University Image

- The contended and satisfied international students served as an inspiration from both academic performance as well as the administrative efficiency of the university. As posted by Ahmed et al. (2010) service quality is a key performance measure in educational excellence and is a main strategic variable for universities to create a strong impact perception and university competitiveness.
- The efforts of the university to meet the needs of international students even exceed social impact as International students claimed LPU as their second home.
- Positioning Lyceum as a university is also promoting its reputation of excellence in the academic community. As it provides and delivers the highest quality product and service among international students is indeed creating a position in which their academic products and services are delivered to its excellent expectation of the customers.
- LPU needs to strategically position in academic business environment; service quality toward satisfying international students require them to continuously improve their present services and ensure its sustainability in attracting more foreign enrollees and international tie-ups.

4.4 Conclusions

- Based on the results of this research, it is an inspiration that quality education is paralleled with the level of satisfaction on the learning experiences provided during International students stay in LPU.
- For International students, their positive campus experiences to various offices reflect the institutional quality provided by their present university, Lyceum of the Philippines in Batangas City. For Elliot and Healy (2001), higher education institutions not only emphasize on students' social values, capabilities, and skills but also their campus experience.
- The experiences of International students maybe be viewed from the perspectives of caring academic and nonacademic staff, comfortable environment, adequate facilities, and resources.

4.5 Recommendation

- The Office of the International Affairs and Linkages may provide an avenue to meet the Deans of all colleges in order to address problems and concerns irrespective of International student's courses.
- During departmental meetings, officers of International students society maybe invited in order to have a feel of their presence in the university and discuss issues on students learning and cultural and social adjustments.
- Reinstalling Feedback survey may also be done to continuously improve all the services of LPU.
- Student services of the university may also provide exclusive programs for International students specific in an atmosphere of a customer-friendly environment and relationships among Filipino students.

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Chapter 5
An Exploratory Study of Sociocultural Adaptation Among International Students in Malaysia

Bessie Ong and K.C. Cheong

Abstract International students who come to Malaysia for higher education encounter additional challenges compared to the domestic students. In particular, the internationals also experience acculturative stress, or culture shock, arising from studying abroad. This study aims to identify the adjustment challenges experienced by international students in an American degree transfer program at a private tertiary institution in Malaysia. A cross-sectional quantitative research design is employed. The results show that acculturation in the program is impacted by five factors. These are labeled as social skills, cultural empathy, interpersonal communication, survival, and involvement in campus activities. Most of the internationals demonstrated moderate to low involvement in social and recreational activities on campus. Those from Pakistan and Bangladesh perceive more cultural difficulties than those from other nations. They are also the least involved in campus activities. The difficulties to "fit in" could have made students from these two countries withdraw into their own ethnic groups, thus reducing opportunities for them to make connections with the other campus communities.

Keywords Acculturation · International students · Sociocultural adaptation · Fitting in

5.1 Introduction

International students come from other countries to pursue higher education in Malaysian institutions (hereby known as college) on a student visa. Their sojourn is transient so they have to quickly adapt socially and culturally to these new situations, as well as adapting to discourses in academic disciplines. Hence, international students encounter more challenges than the domestic students in their transition to college.

B. Ong (✉) · K.C. Cheong
School of Liberal Arts and Science, Taylor's University, Subang Jaya, Malaysia

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Culture shock is normally experienced by anyone relocating to a new country (Oberg, 1960). Such anxieties result from the loss of social support from one's own culture while establishing a new one in the host culture (Adler, 1975; Kenneth, 1971). The culture shock theory has since been extensively researched and several associated concepts and models have emerged. A notable one by Berry (1970) proposed the concept of acculturative stress to refer to conflicts arising from living abroad. He considers acculturation as a transitional process that can have both positive and negative experiences. Eventually these issues will disappear because the sojourner can adapt, albeit at different rates, depending on individual characteristics.

Cross-cultural adaptation is distinguished by Searle and Ward (1990) into two domains—psychological and sociocultural adaptations. Psychological adaptation comes about from employing coping strategies in order to achieve emotional well-being. Those who experienced psychological distress are more likely to become lonely, homesick, and depressed, or display some psychosomatic disorders (Ward & Rana-Deuba, 1999). Sociocultural adaptation, on the other hand, is a behavioral adjustment to "fit in" by acquiring appropriate cognitive skills to interact in the host environment.

Searle and Ward (1990) developed the Sociocultural Adaptation Scale (SCAS) to measure the outcome of sociocultural adaptation among international students. The earlier version assessed intercultural competence with emphasis on behavioral domains. Later, Ward and Kennedy (1999) expanded the SCAS to consist of 40 items with the addition of more cognitive domains. The instrument allowed these items to be modified and selected to suit the characteristics of the sample. Various versions of the SCAS have been found to be reliable and psychometrically robust across a wide range of culturally diverse sojourning groups, including students and adults (Ward & Kennedy, 1999).

This analysis is a preliminary case study of the sociocultural adaptation of international students at an American degree transfer program (ADP) in a private Malaysian university. Specifically we will be looking at the ability of these students to survive and adapt to the Malaysian culture and to interact effectively with the local and other ethnic students. The SCAS by Ward and Kennedy (1999) is selected as the instrument of our survey due to its ease of use and flexibility as a preliminary survey. Our objectives are to determine (i) how well are international students interacting and adapting socially and culturally in this program; (ii) how is socio-cultural adaptation affected by selected demographic characteristics, particularly, length of time in country, country of origin, and the type of residence.

The ADP enrolls students for a period of five semesters for credit transfer to North American four-year institutions to complete an undergraduate degree. The student population is approximately 700 of which 12% are internationals. Being a private university, tuition fees are much higher than the national ones. Scholarships are limited, so students who enroll in this private university are from middle- and upper-middle-income groups. ADP serves as a bridging program to prepare students for the American tertiary curriculum and also as a cost-saving measure for many. Their stay in the program, and in Malaysia, is very transient, that is, not more

than two years before they transfer their study credits to North American universities. Hence, the acculturation process of this group of students in ADP has to be swift. Recognizing the issues that impact their adaptation would be the first step to facilitate an easier "fitting in" for these international students.

5.2 Literature Review

Sociocultural adaptation is a process associated with how well an international student is able to "fit in" the new environment. It is dependent on his or her social skills and competency in managing the day-to-day tasks required for surviving and integrating in this new culture (Ward & Kennedy, 1999). Some of the many factors that have been identified to impact sociocultural adaptation include language fluency, length of time in the country and cultural distance.

The lack of comprehension of English and differences in accent can impact the understanding of the lectures (Nasirudeen, Koh, Lau, Lim, & How, 2014), besides difficulties in oral and written communication (Abraim-Yago, Yoder, & Kataoka-Yahiro, 1999). English language proficiency is especially a major barrier for students from non-English-speaking countries who study in countries in which English is the first language such as the USA, Canada, UK, and Australia; or in countries where courses are conducted in English (Poyrazli, Thukral, & Duru, 2010; Sandhu & Asrabadi, 1994). For instance, non-English-speaking Asian students in Singapore where courses are conducted in English experience a higher level of acculturative stress (Nasirudeen et al., 2014).

While English proficiency is important in the classroom, awareness of the linguistic diversity in which English is spoken in a multicultural country like Malaysia is equally important for cross-cultural interaction outside the classroom (Khojastehrad & Sattarova, 2015). Malaysians from different educational, ethnic, and geographical backgrounds speak English at different levels of proficiency. An international student who just arrived in Malaysia often think that someone who is speaking English actually sounds like speaking Chinese or Malay.

Length of stay in a new country is another predictor of acculturative difficulties. Normally, culture shock becomes diminished after a longer period in the country. Ward and Kennedy (1999) found Malaysian and Singaporean students encountered the greatest social difficulty during the first month of stay in New Zealand, but were able to adapt and cope better after six to twelve months in the country. In the study by Nasirudeen et al. (2014) international students who stayed longer in Singapore also reported lower levels of homesickness.

Cultural distance refers to the similarities in cultural norms, language, and economy between the host and the home country. The more similar in cultural/social norms and communication patterns, the less discrimination will be perceived by the internationals. They would feel more easily accepted and socially

connected instead of being isolated and lonely. Thus compared to Europeans, Asian students, whose culture is typically collectivistic, found it harder to adapt to the Western type of culture in the USA which emphasizes individualism and assertiveness (Fritz, Chin, & DeMarinis, 2008; Yeh & Inose, 2003). But Malaysian students studying in Singapore experienced lower acculturative stress than those from China and Myanmar since Malaysia and Singapore are regional neighbors and both countries share the same multicultural norms and language (Nasirudeen et al., 2014).

5.3 Method

5.3.1 Instrument

The instrument that we used consisted of two sections. Section I gathers some demographic data of the participants such as the country of origin, the time when they first arrived in Malaysia, and where they are staying while in Malaysia. The second part is a modified version of the Sociocultural Adaptation Scale (SCAS) developed by Ward and Kennedy (1999). The original SCAS had 40 items and was designed to measure the degree to which international students perceived difficulties in understanding the local values and cultures, interacting with the hosts, meeting the demands of daily life, and behaving in a culturally appropriate manner. We selected 26 items that are relevant to our sample. Participants respond to all the 26 items in the questionnaire using a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The statement for each item in the scale was in the first person (e.g., I have no problems in understanding the local jokes).

5.3.2 Participants

We distributed the questionnaire to all the 83 international students in the program. Sixty-four completed questionnaires were returned after two weeks, making a sampling success of 77%. There were 61% male and 39% female, originating from 18 different countries. The majority of them are from East Asia (e.g., Korea 31%, China 3%, Kazakhstan 3%, Japan 3%, Hong Kong 2%), the Indian continent (e.g., Pakistan 11%, Bangladesh 8%, Sri Lanka 6%, India 2%), Southeast Asia (e.g., Indonesia 11%, Singapore 3%, Myanmar 3%) while other countries are less represented (e.g., 3% from Canada, Iran and Yemen; 2% each from France, Morocco, and Maldives). Since the students from Pakistan, Bangladesh, Korea, and Indonesia make up the majority of the international student population in the ADP, our data analysis will focus on these nationals only.

5.3.3 Data Analysis

Kaiser-Meyer-Olkin (KMO) test of sampling adequacy (KMO = 0.845) and the Bartlett test of sphericity (p = 0.000) indicated that factor analysis can be applied on the responses to produce reliable constructs or dimensions. In order to identify the underlying constructs or dimensions, responses from participants were analyzed using principal component factor analysis (SPSS version 21). Preliminary examination of the emerging factors indicated low interfactor correlations. Therefore, the factors were considered unrelated and an orthogonal (varimax) rotation was employed. Examinations of the Scree Plot of the variance associated with each factor and changes in eigenvalues across factors were used to determine the number of factors to retain.

One-way analysis of variance (ANOVA) was run on the extracted factors to determine whether there are any significant differences among the international students with respect to (i) length of stay which we categorized as being in Malaysia for less than six months, from 7 to 12 months and exceeding 12 months; (ii) country of origin where we used only the countries that are more represented, i.e., Korea, Indonesia, and Pakistan and Bangladesh, the latter two are in one group that represented nationals from the Indian continent; and (iii) type of residence in Malaysia, which includes staying at the university dormitory, other residences outside the campus, and staying with their family in Malaysia.

After the ANOVA, a post hoc procedure using Scheffe's subtest was done to verify mean differences among groups of equal variances and of different sample size while Tamhane's T2 subtest was used for groups of unequal variances and of different sample size. Levene's test was used to verify homogeneity of variances among the groups.

5.4 Results

Descriptive statistics in Table 5.1 indicate that most students are staying off campus with other students or with their family. Only about 28% of them are staying in the campus dormitory of which the majority is staying alone instead of sharing the room. These students are from Pakistan/Bangladesh and Korea. A large proportion of Indonesian and Korea are actually staying with their family who are working as expatriates in Malaysia for more than 12 months. The Pakistani and Bangladesh, however, are mainly new arrivals commencing their sojourn to Malaysia in the first semester at this university.

Examination of the Scree Plot and eigenvalues indicated that five factors are reasonable and conceptually meaningful. These five factors accounted for 68.02% of the total variance. All factor loadings above 0.50 are presented in Table 5.2.

We labeled Factor 1 as social skills. This factor consists of seven items relating to interaction with the local students, other ethnic groups, gender differences, and

Table 5.1 Percent distribution of length of stay and type of residence by country of origin

	Pakistan and Bangladesh (n = 12)	Indonesia (n = 7)	Korea (n = 20)	Total
Type of residence				
In campus—alone	7.7	0	17.9	25.6
In campus— with a roommate	2.6	0	0	2.6
Off campus with others	15.4	5.1	20.5	41.0
Living with family	5.1	12.8	12.8	30.8
Length of stay				
<6 months	10.3	0	5.1	15.4
7–12 months	10.3	0	2.6	12.8
>12 months	10.3	17.9	43.5	71.8

dealing with unsatisfactory service. Students who score high in this factor (mean ± standard deviation = 3.83 ± 0.91) perceive themselves as having good social skills.

Factor 2 which we label as cultural empathy consists of four items that indicates adjustments to the local customs, food, and academic pace. High score in this factor (3.72 ± 0.99) indicates students perceive themselves to be accepting and culturally tolerant of the local customs and norms.

Factor 3 or interpersonal communication is represented by five items that focus on openness to cross-cultural communication at various levels and perspectives. High score in this factor (3.99 ± 0.83) refers to self-perception of good communication skills.

Factor 4 refers to survival. It is made up of four items that describe ability to find their way around and to attend to daily basic needs such as food and transport. A high score in this factor (4.17 ± 0.73) indicates little problem in taking care of their day-to-day essential needs.

Factor 5 or campus involvement is formed from two items relating to involvement with social and recreational activities on campus. Although there are only two items in this factor, we regard it as a conceptually distinct factor. This is the only factor that shows low students perception (2.86 ± 1.23), i.e., the lack of involvement in campus activities.

The one-way ANOVA was conducted to examine whether some demographic characteristics affect each of the above extracted factors. The results showed that length of stay has no significant effect ($p > 0.05$, Table 5.3) on any of the extracted five factors. However, the country of origin and the type of residence each showed a significant difference ($p < 0.05$) with regard to cultural empathy (Factor 2). Further analysis with Scheffe's test indicated that students from Pakistan and Bangladesh are significantly less culturally adapted ($p < 0.05$) than the Koreans and Indonesians. Also, students living in the university dormitory have more difficulty

Table 5.2 Exploratory factor analysis of the SCAS of international students in ADP

Items	Factor loading				
	1	2	3	4	5
I have no problems in understanding the local jokes	0.582				
I easily make friends with different ethnic groups	0.822				
I easily make friends with other Malaysian students	0.772				
I can easily relate to members of the opposite sex	0.726				
I am confident to deal with someone unpleasant/angry/aggressive	0.551				
I am adjusting well to living in the local accommodation/residence	0.502				
I can confidently deal with unsatisfactory service	0.548				
I enjoy the local food		0.825			
I can understand the local accent/language		0.782			
I can adapt to the local etiquette/customs/communication style		0.783			
I am adapting well to the pace (speed) at which lessons are taught		0.503			
I am confident to talk about myself to others			0.558		
I can accept the perception of me from fellow students			0.646		
I am confident to deal with people in authority (dean/lecturer)			0.550		
I am confident to deal with bureaucracy (administration/office staff)			0.647		
I am confident to communicate in English in class and with others			0.723		
I have no problems to use the local transport system				0.779	
I can easily make myself understood				0.753	
I have no problems following rules and regulations on campus				0.622	
I have no problems going shopping				0.510	
I regularly go to social events/gatherings/functions on campus					0.786

(continued)

Table 5.2 (continued)

Items	Factor loading				
	1	2	3	4	5
I actively participate in recreational activities and sports on campus					0.815
Internal consistency (Cronbach's α)	0.913	0.855	0.823	0.735	0.875
Cumulative % of total variance	18.99	34.44	48.56	60.10	68.02
Total mean ± standard deviation	3.83 ± 0.91	3.72 ± 0.99	3.99 ± 0.83	4.17 ± 0.73	2.86 ± 1.23

Factor 1 Social skills; *Factor 2* Cultural empathy; *Factor 3* Interpersonal communication; *Factor 4* Survival; and *Factor 5* Campus involvement

to adapt to the local culture and customs than those living outside the campus and those staying with their family.

Table 5.3 also showed that students are most active in campus activities during their first six months in Malaysia, but their involvement waned as the length of stay increases. Those from Pakistan and Bangladesh are the least involved among all the nationalities. Surprisingly those staying in the campus dormitories are less engaged in campus activities than those living outside or with their family despite living within the vicinity of the campus.

Since the country of origin and the type of residence are found to significantly affect cultural empathy (Factor 2), we calculated the mean values for each of the variables in this factor to examine for specific item that has been impacted by the mentioned demographic variables. As shown in Table 5.4, students from Pakistan and Bangladesh, unlike the others, did not quite like the food in Malaysia. Neither do they find it easy to understand the local language, accent, communication style, and the customs. Likewise, those living in the campus dormitory are less accepting of the local food, language, accent, communication style, and the customs compared to those living in other types of residence (Table 5.5).

5.5 Discussion

This study has enabled us to understand some of the sociocultural challenges encountered by international students in their acculturative process at ADP in Malaysia. Five factors are found to impact the acculturation process, namely social skills, cultural empathy, interpersonal communication, survival, and involvement in campus activities. We consider these factors as subscales that split off from the original two main factors extracted by Ward and Kennedy (1999), i.e., cultural empathy and relations, and impersonal endeavors and perils. These differences are probably due to the differences in the sociocultural context of our study and theirs. Nonetheless, the instrument has illustrated some adjustment issues encountered by our international students.

Students from Pakistan and Bangladesh stand out as a group that is the least engaged with campus activities and also less culturally adjusted compared to the Indonesians and Koreans. With regard to the latter, their perception toward the local food, custom, language, and communication style is less favorable. Both these countries are from the North Indian continent which is culturally more different from Malaysia in many aspects. For instance, the Pakistani Urdu and the Bengali languages have different communication patterns, signs, and symbols from the Malay and Mandarin languages that are commonly used among Malaysian students for communication outside the classroom other than English. These differences in communication variables, especially linguistic variety of spoken English and proficiency in the host cultural language, have been found to be an important mediating factor for making contact with the host culture in Malaysia (Khojastehrad & Sattarova, 2015; Mustaffa & Ilias, 2013). A large proportion of the local student

Table 5.3 ANOVA between length of stay, country of origin, type of residence, and the extracted sociocultural factors

		Mean ± SD				
		Social skills	Cultural empathy	Interpersonal comm.	Survival	Campus involvement
Length of stay	≤6 months (n = 12)	3.76 ± 1.18	3.46 ± 1.09	4.25 ± 0.83	3.98 ± 0.71	3.04 ± 1.18
	7–12 months (n = 10)	3.81 ± 0.54	3.45 ± 0.78	4.20 ± 0.54	4.10 ± 0.52	3.00 ± 0.78
	≥12 months (n = 42)	3.86 ± 0.92	3.88 ± 0.99	3.88 ± 0.87	4.24 ± 0.78	2.77 ± 1.34
Country of origin	Pakistan and Bangladesh[#] (n = 12)	3.55 ± 1.07	3.13 ± 1.04[a]	4.33 ± 0.51	4.04 ± 0.63	2.50 ± 1.11
	Indonesia (n = 7)	4.43 ± 0.58	4.46 ± 0.51[a]	4.20 ± 0.58	4.32 ± 0.70	2.71 ± 0.91
	Korea (n = 20)	3.92 ± 0.84	4.09 ± 0.74[a]	3.72 ± 0.94	4.23 ± 0.67	2.83 ± 1.44
Residence	In-Campus ** (n = 17)	3.56 ± 0.94	3.34 ± 0.89[b]	3.82 ± 0.84	4.07 ± 0.69	2.71 ± 1.12
	Off-campus (n = 33)	3.81 ± 0.91	3.70 ± 1.01[b]	4.00 ± 0.89	4.14 ± 0.79	2.97 ± 1.21
	Family (n = 14)	4.22 ± 0.83	4.30 ± 0.83[b]	4.20 ± 0.61	4.34 ± 0.68	2.79 ± 1.46

One-way ANOVA (sig. at the 0.05 level); Mean difference is sig. at the 0.05 level (Scheffe's subtest: p value)

[a]ANOVA: $p = 0.002 < 0.05$; [#]Between Pakistan/Bangladesh and Indonesia: $p = 0.006$; and Between Pakistan/Bangladesh and Korea: $p = 0.010$

[b]ANOVA: $p = 0.022 < 0.05$ **Between in-campus and family: $p = 0.023$

Table 5.4 Mean values for items in cultural empathy (Factor 2) according to country of origin

	Mean ± SD		
	Pakistan and Bangladesh	Indonesia	Korea
I like the local food (q14)	2.83 ± 1.467	4.71 ± 0.49	4.40 ± 0.82
I can understand the local accent/language (q21)	2.67 ± 1.435	4.14 ± 1.1	3.85 ± 0.88
I can adapt to the local etiquette/customs/communication style (q22)	3.25 ± 1.435	4.57 ± 0.54	3.90 ± 1.02
I am adapting well to the pace at which lessons are taught (q26)	3.75 ± 1.055	4.43 ± 0.79	4.20 ± 0.89

Table 5.5 Mean values for items in cultural empathy (Factor 2) according to type of residence

	Mean ± SD		
	Staying in campus dormitory	Staying with other students outside campus	Staying with family
I like the local food (q14)	3.29 ± 1.40	3.91 ± 1.40	4.29 ± 1.14
I can understand the local accent/language (q21)	3.18 ± 1.02	3.18 ± 1.31	4.07 ± 1.14
I can adapt to the local etiquette/customs/communication style (q22)	3.41 ± 1.00	3.55 ± 1.18	4.43 ± 0.85
I am adapting well to the pace at which lessons are taught (q26)	3.47 ± 1.07	4.15 ± 0.87	4.43 ± 0.76

population in this private university is Chinese by race. The Chinese are culturally and religiously different from the Pakistani and Bangladeshi, but are more cultural similar to the Koreans. Indonesian students generally feel at home in Malaysia since we are regional neighbors. Besides, Malaysia and Indonesia have nearly similar cultural norms and language. Also, the Korean and Indonesian students have been in Malaysia for more than a year and many are staying with their family. Thus, both the Koreans and Indonesians can blend more easily into the Malaysian society, while those from Pakistan and Bangladesh are more awkward in their social interactions. This finding is similar to other studies in which adaptation is found to be negatively associated with cultural distance (Demes & Geeraert, 2013; Fritz et al., 2008; Yeh & Inose, 2003; Ward & Kennedy, 1999).

Because students from Pakistan and Bangladesh face difficulties to fit in, they would more likely form cliques among their own ethnic group for social support and emotional comfort. Retreat into the same ethnic group can make international students less eager to make contact with the host community and to enlarge their social circle (O'Reilly, Ryan, & Hickey, 2010). Similar observations are made by Ee (2013) and Kusek (2015) in which cultural differences led international students to gather with those from similar cultural backgrounds, and resulting in low level of

engagement with the local community. However, a study by Wu, Garza, and Guzman (2015) showed that international students studying in the USA experienced social isolation in class and social event because their American peers do not understand their background and tend to exclude them from their activities. Since the scope of our study is exploratory, we are unable to ascertain whether the lack of engagement in campus activities by students from Pakistan and Bangladesh is due to their reluctance to broaden their social networking or because they felt marginalized.

The next issue relates to the low cultural empathy of students living in the campus dormitory. The place of residence can be considered as a container in Aneshensel's (2010) "person–environment fit" model and it can affect an individual's social interactions leading to acculturative distress depending on individual characteristics. This observation is affirmed by Nair (2014) who shows students in Singapore who are staying in international student hostel experienced more acculturative stress because they are living in an enclave that reduces contact with the host community. Living within campus dormitory, and especially if they are not sharing the room with other nationals, can reduce opportunities to connect and interact with others in order to promote cross-cultural interaction. Hence, the disinterest gets to involve with the campus social and recreational activities because they have no friends to relate to. We would like to suggest that internationals who are allocated residence in the campus hostel must share the room with either the host national or other ethnic groups, instead of living alone. The social support arising from this arrangement can also help reduce feelings of loneliness and homesickness (O'Reilly et al., 2010), thus improving not only their psychological but also sociocultural adaptation, as both are interrelated. Pairing of an international freshman with a senior buddy could be another way to improve their adaptation.

Overall engagement in campus activities was found to be most active during the sojourners' first six months in the program. This can be attributed to the various first-year experience (FYE) activities that are organized as part of the orientation endeavor in ADP. In the subsequent semesters, the international students become less involved as the orientation activities are focused on freshmen in the first semester. The reduced engagement after six months in the program could also imply that they have found their own social groups and they are associating with them on a private basis.

The findings of the present study should be carefully interpreted because we focused on a small group of international students at a specific program. Thus, generalizability of the findings beyond this group of international students as well as to the institution at large is limited. Also, the flexibility of the SCAS across cultural contexts may in itself be a limitation as applications across different contexts and acculturating individuals may not be comparable.

Acculturation is a complex process. Each culture has its own peculiarity and needs. This study has revealed only certain engagement behaviors and perceptions exhibited by international students at ADP. Their social networking pattern is worth further exploration since community interactions are essential for building cross-cultural relations (Rienties, Johan, & Jindal-Snape, 2015). So establishment

of specific efforts aimed at making international students to be more involved/engaged in the campus throughout their stay here could encourage more intercultural friendships.

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Chapter 6
First-Year Experience (FYE) Curriculum Review for Academic, Social, and Emotional Connect

Prema Ponnudurai and Rajalakshmi Ganesan

Abstract As Asia focuses on becoming a global educational hub, first-year experience (FYE) is commanding center stage. Studies have indicated that success in HE lies in its curriculum being academically, socially, and emotionally engaging. Therefore, a curricular review of the American Degree Transfer Program (ADTP) was conducted focusing on FYE practices in addressing the needs of first semester, transitioning students. This paper synthesizes two governing FYE theories, Kift (The next, great first year challenge: Sustaining, coordinating and embedding coherent institution-wide approaches to enact the FYE as 'everybody's business'. Keynote. 11th Pacific Rim first year in higher education conference: an apple for the lecturer, 2008) and Tinto (Int J First Year High Educ 3(1):1–8, 2012) in analyzing and reviewing the curricula. The key components of transitional skills, academic, and social initiatives were analyzed in a quantitative and qualitative mode. A *t* test analysis indicated that the current practice was significantly different ($t = -7.31$, $p < 0.05$) from the ideal practice with a large effect size (Cohen's $d = 1.3$). The qualitative evaluation of the current practice revealed that the strengths of the program were in its academic and social initiatives, however, weak in its transitional skills support. Simplified, it is imperative that efforts are continuous in refining the curriculum to meet students' needs, engage students academically, socially, and emotionally for first-year student's success.

Keywords First-year experience · Curriculum review · Academic · Social and emotional connect

P. Ponnudurai (✉) · R. Ganesan
Taylor's University, Subang Jaya, Malaysia
e-mail: Prema.Ponnudurai@Taylors.edu.my

R. Ganesan
e-mail: Rajalakshmi.Ganesan@Taylors.edu.my

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6.1 Introduction

Higher Education (HE) is becoming a dominant component of many economies globally. With the main initiative to establish a knowledge-driven economy, Malaysia has also placed the education sector in the forefront of its development. With these new developments alongside other initiatives to promote Malaysia as an educational center, there has been an escalation of students entering higher education. By 2025, the Malaysian Educational Ministry aims to increase access to higher education by increasing tertiary enrollment rates from 36 to 53% (Chapman, Rebecca, Ann-Marie, & Stephanie, 2015).

Nevertheless, with all these initiatives although there seem to be an increase of students, keeping the students for 3–4 year undergraduate courses and postgraduate is easily becoming a challenge. The scenario faced by public and private universities is similar whereby, it is the general trend that every year the attrition rate increases, due to high competition between colleges and institutions and escalating cost of student recruitment (Govindarajo & Kumar, 2012).

Concurrently, there are extensive studies which support the notion that first-year student experience (FYE) and regard it as a critical transition period for new students in helping them settle into university life and emphasize its importance in relation to successful learning and retention (Tinto, 2002; Thomas, 2012; Morgan, 2012). Additionally, Hughes (2002) elaborates that attrition rates are a reflection of problems with the course, mainly in areas of the delivery mode, content, or design.

This study is reviewing the American Degree Transfer Program (ADTP) conducted by a private university which is a 2 + 2 year program, whereby students enrolling into the program are mainly school leavers having either completed the Malaysian High School Certificate (SPM), the International General Certificate of Secondary Education (IGCSE), or O-levels. The student will complete the freshman and sophomore years in Malaysia, spending approximately 3–6 semesters (≤ 2 years) while accumulating 40–60 credits, before transferring their credits to American, Australian, or Canadian universities to continue their final two years and graduating. Therefore, all first-year initiatives are implemented in the first semester due to the constraints and nature of this program; since some students transfer to USA within a year, the first-year experience and first semester terms are used interchangeably throughout the paper. Therefore, this issue is very much in the vanguard of problems faced by local institution as well as worldwide.

As a result, this investigative study is focused on evaluating the subscribed FYE initiatives in the current ADTP curriculum, while identifying the strengths and weakness in the curriculum in the effort to reduce attrition rates among its students, which will ultimately provide some direction in identifying effective transitional pedagogies to be incorporated for student retention.

6.1.1 Contributing Causes of Attrition in HE

From the empirical studies on the area of FYE and Student Success, many researches have indicated a host of attributes of student attrition. In general, these contributing factors are the main causes of attrition faced by the universities:

1. Transition from secondary school to university
   The learning outcomes of secondary school are not similar to the focuses of a university, as both have vastly different intentions. Draper (2008) argues the business of schools is to make the lessons interesting and useful for the students and not to prepare them for higher education. As such, due to this disconnect, the student becomes the victim of this transition process, as there are vast changes from teaching to learning pedagogies, environments, quantity of knowledge, from the two stages of their educational process (Krause, Hartley, James & McInnis, 2005; Yorke & Longden, 2007).
2. External university factors
   Draper (2008) who adapted Tinto's (1975) model indicated that external factors include family background and attributes, financial stability, social standing, individual attributes, and prior qualification. Universities have very little power over the influence of these external factors.
3. Lack of knowledge of student's needs
   Bovill, Bulley, and Morss (2011) point out that students were consulted less often than employers and other stakeholders with regards to designing the curriculum to meet student's needs and wants. As such, the focus of most university-level courses is to develop individuals to contribute to the workforce of the country (Dathan, 2013). Further, the latest Malaysian Education Blueprint for higher education (HE) 2015–2025 launched by the Malaysian prime minister clearly indicates the focal point of HE is in molding the future workforce of the country and to change the mindset of graduates from being 'job seekers' to 'job creators' (Chapman et al., 2015). This societal need is put far above the student's individual need and contributes to student attrition, as it furthers the gap between high school and university and causes the transition process to be even more daunting.

6.1.2 Importance of Examining the Curriculum

On a basic level, curriculum can simply be defined as 'an interactive process developed among learners, teachers, materials and the environment' (Chen, 2007, p. 120). Nevertheless, in today's educational climate the term curriculum extends far beyond teachers, classrooms, and content, but needs to place students/learners in the center thus broadening this term. Kift (2004) has coined the term 'transitional pedagogy' when relating to the review of curriculum and should be primarily used

to scaffold and mediate the first-year learning experience for existing cohorts. When reviewing the curriculum, it is also imperative that there is a 'focus on articulating, implementing, and sustaining first-year curriculum design that is engaging, supportive, intentional, relevant, and social' (STAR, 2005). The first step in combatting the issue of attrition is by reexamining the curriculum in accordance to the three main thrust areas identified: transitional skills, academic initiatives, and social aspects.

The term 'Transitional skills' or 'Induction to Study' is also commonly used and refers to the 'activity of learning how to study at university' (Morgan, 2013, p. 1449). These skills are imperative to student's success at university.

Frankola (2001) and Potter and Bye (2014) list the main reasons for student dropout rates were due to weak time management skills, specific learning styles, lack of motivation, lack of preparedness for university, poor study strategies, and inefficient technological knowledge. Additionally, Morgan (2013) states that it is this 'element that is lacking and which can create problems when settling into university and study' (p. 1147). Therefore, it is important that the curriculum reflects components that include course-specific skills and general academic skills for students such as time management, ICT skills, language skills in the areas of proficiency, and academic writing, in order to ease the transition from secondary school to university.

6.2 Methodology

Studies on curriculum design focus on the two main components of the curriculum: lecturers and students (Bovill et al., 2011). However, this study will be focused on reviewing the systems and practices embedded in the current curriculum of this program and fulfilling the syllabus and simultaneously addressing first-year experience and elements in the program which address student integration. Therefore, to achieve these objectives, data were collected from various sources; analyses of course syllabus, informal interview with academic leaders and Associate Dean of Clubs and Associate Dean of Teaching and Learning, Academic Success mentors (ASM), and informal ICT usage data which were all ethically obtained.

Collected data were analyzed using the qualitative and quantitative methods. A content analysis was first conducted to align and evaluate the current practice to the ideal practice. The ideal practice that the current curriculum was evaluated against incorporates two main theories which govern first-year experiences, namely Tinto's model of student retention (1975) adapted by Draper (2008) and Kift's (2008) first-year curriculum model, focusing on the three main pinnacles of first-year experience: academic skill, academic integration, and social integration. Table 6.1 shows the conceptual framework used for the FYE curriculum review. As there has been an amalgamation of two main FYE frameworks, in order to investigate and evaluate the program curriculum, the theoretical framework which aptly guides this study is of Vygotsky's (1978) social constructivist theory. This study

Table 6.1 Conceptual framework for FYE curriculum review

First-year framework	Recommended FYE practices	Current practices
Traditional soft skills integration (Developmental programs—Soft skills to help bridge high schools to university preparation)	Tinto (2012):	
	– Basic academic writing course	Not offered
Freshman seminars	Keup (2005); Potter and Swing (2006):	
	– Freshman seminar focusing on skills	Not offered
Pre-enrollment programs	Kift (2008), six principles of curriculum design:	
	– Time management	Not offered
	– Academic skills	Not offered
	– Test taking skills	Not offered
	– Library literacy skills	Provided to freshman
	– College level- reading skills	Not offered
	– Working in groups	Not offered
	– Decision-making skills	Not offered
	Raab and Adam (2005):	
	– Remedial core course-prior to enrollment	Not offered
Academic integration	Kift (2008) and Keup (2005) first-year curriculum design:	
	Diversity	
	– Blended teaching and learning approaches	Highly practiced—all classes include blended learning pedagogies at various degrees
	– Peer-Assisted Student Support (PASS)	Averagely practiced—PASS programs are available for 12 out of the 48 subjects offered in total
	– Self-reflection activities	Averagely practiced
	Design	
	– E-portfolio	Not practiced
	– Career and employability programs	Not practiced
	– Industry and alumni linkages	Not practiced
	Engagement	
	– Active learning pedagogies—Team/group work	Highly practiced across all courses
	– Small class sizes	Highly practiced
	– Cumulative assessments	Averagely practiced

(continued)

Table 6.1 (continued)

First-year framework	Recommended FYE practices	Current practices
	– Academic mentors	Highly practiced
	Assessment	
	– Early feedback	Averagely practiced
	– Provide samples of 'poor,' 'average,' and 'good' pieces of work	Not practiced
	– Develop individual study	Averagely practiced
	Evaluation and monitoring	
	– Early alert systems	Highly practiced
	– Attendance and participation	Highly practiced
Social and emotional integration	Closson and Nelson (2009); Draper (2008)	
	– Incorporation of experiential learning opportunities—community service	Averagely practiced
	– Peer/buddy program, mentor/mentee programs	Highly practiced
	– Extracurricular activities (ECA)	Highly practiced
	– Orientation programs	Highly practiced

aligns with the constructivist theory as it places the student in the center, focusing on the students' needs to transition into a different educational setting and given the opportunity to be actively engaged in their new environments both academically, socially and eventually emotionally. A one-sample *t* test was also performed to identify if the current curriculum at the ADTP differs significantly from the ideal practice.

6.3 Results

As this study sets out to review the current practices of the ADTP and the recommended practices of first-year experience initiative, both of these elements are listed in Table 6.1 and matched toward each other for alignment and to identify the strengths and areas of weakness with the program and to identify the areas which would require improvements.

Table 6.2 Overall review findings

FYE framework	Implemented FYE practices (%)	Evaluation
Traditional soft skills integration	11	Weakness
Academic integration	73	Strength
Social and emotional integration	100	Strength

Table 6.3 One-sample statistic

	N	Mean	Std. deviation
Current practice	30	1.83	0.87

Table 6.4 One-sample test

	Test value = 3			
	t	df	Sig. (2-tailed)	Mean difference
Current practice	−7.31	29	0.000	−1.17

To sum up, from the comprehensive and in-depth review of the program curriculum, it is clear that there are certain strengths in the programs and areas of weakness which need to be addressed, as depicted in Table 6.2. Overall, it was found that there is serious weakness when analyzed quantitatively in the area of academic support for transitional soft skills integration which has only 11% of the suggested practices being accomplished. There lacks any form of transitional soft skills programs to help high school students transition smoothly into university, as it is assumed that they will learn these skills along the way. Academic initiatives and teaching learning strategies are the strengths of the program, where 100% of the recommended FYE practices is implemented and monitored consistently. All of the above, done in a collaborative manner is seen to the backbone for engaging first-year students, providing experiential learning and creating a meaningful learning experience (Tsang, 2011).

From Tables 6.3 and 6.4, the one-sample t test revealed that there is a significant difference between current practices and the ideal practice, as $t = -7.31$ had $p = 0.00$ ($p < 0.05$). The average difference between the current practice ($M = 1.83$, standard deviation = 0.87) and the ideal practice ($M = 3$) is −1.17. This difference is considered quite large as the effect size (Cohen's d) is 1.3. This clearly and empirically shows that the current practice at the ADTP still needs to work on improving the FYE initiatives to facilitate optimal experience and performance from students. Although the ADTP's academic integration, social, and emotional integration practices have come out as strengths, on the whole the current practice does not measure up to the ideal FYE practices.

6.4 Discussion

The goal of many first-year experience programs is to enable a smooth transition for high school leavers into university in the hope that this would provide students with a strong foundation year to support them throughout their university days and in turn reduce university attrition rates. Although past studies have been carried out by universities on a large scale, first-year curricular reviews need to be conducted on a micro-level within each program in the university, to include or exclude first-year initiatives specific to that particular program structure, in order to wield positive results on the whole. Despite the limitations of this study, the curricular strengths and weakness have been identified. Nevertheless, more comprehensive quantitative and qualitative studies need to be undertaken to further improve the areas of shortcomings in the program. Academics too need to be sensitive to their current student's needs, whereby they demonstrate and value individual student's strengths (Zepke, 2013) and importantly the right type of trainings need to be identified to equip academics with the skills and know-how to conduct and monitor FYE initiatives effectively.

As with the success of building learning communities, academics should further develop "teaching communities" to enhance and share success teaching strategies to increase student success. With the first-year concept still lagging in Asia, the program needs to further progress in stage 3 and 4 of first-year experience, which should be pursued purposefully in a multilayered, partnership approach that encourages and is supported at a variety of levels of organizational engagement (Kift, 2008). It is undeniable that an institution-wide framework would be beneficial and is the 'essential structure for sustainability' (Kinniburgh, 2013). Once there are significant opportunities or students to experience sound transition skills programs, efficient and wholesome academic, social and emotional environments from all levels, will they truly experience a holistic education system with clear interdisciplinary outcomes, will we have an impactful first-year experience program.

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Chapter 7
Social Media Dependency: The Implications of Technological Communication Use Among University Students

Malissa Maria Mahmud, Chandra Reka Ramachandiran and Othman Ismail

Abstract With the prevalent technological advancements, social media are ubiquitous. Such phenomenon has notably shifted and redefined the paradigms of communication. In the last decades, numerous studies have documented an increased number of social detachment attributed to the uprising utilization of social media and have linked it to the deterioration and mitigation of face to face interactions. In this paper, we postulated that computer-mediated communications, predominantly social media, are the widely preferred means of communication among students in which they have become too reliant on social media; thus, it influences and compromises the quality of face to face interactions. The data was collected via an administered online survey to probe on the postulated variables. Besides the survey, a field observation was conducted to facilitate the validation of the collected data through different means of sources. Findings from the online survey suggest that students prefer face to face interaction. However, students rely on social media because they can be portrayed differently and be less shy. When it comes to distant relationships, social media increases the quality of face to face interactions. As for the observation, the findings show that students were inclined to resort to social media when situated in social contexts.

Keywords Social media · Reliance · Deterioration · Face to face interactions

M.M. Mahmud (✉)
Centre for American Education, Sunway University, Bandar Sunway, Malaysia
e-mail: malissam@sunway.edu.my

C.R. Ramachandiran
School of Liberal Arts and Sciences, Taylor's University, Subang Jaya, Malaysia
e-mail: ChandraReka.Ramachandiran@taylors.edu.my

O. Ismail
APB, MARA University of Technology, Shah Alam, Malaysia
e-mail: othmani@salam.uitm.edu.my

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7.1 Introduction

In the recent decade, many individuals tend to rely more on technology to the point where if it ceased to exist, the efficacy of many tasks which are highly dependent on technology would be compromised. Today's teenagers, or more known as the millennials, are exposed to different types of technology in many aspects of their lives (Browning, Gerlich, & Westermann, 2011). In this context, the pervasive routine to always be connected has fashioned social media to be an essential relational context for the young adults. Evidently, they actively engage in social networking, text messaging, blogging, content sharing, online learning, and many more on a daily basis (Cassidy, Britsch, Griffin, Manolovitz, Shen, & Turney, 2011). This is largely due to the widespread employment of social media among university students. In a study conducted by Pempek, Yermolayeva and Calvert (2009), 92 college students used Facebook for about 30 min a day, frequently posting content to a wide audience. They not only update their Facebook status, but more often note the posted content by others rather than producing it. Furthermore, Lenhart mentioned in her article that:

> Aided by the convenience and constant access of mobile devices, especially smartphones, 92% of teens report going online daily—including 24% who say they go online "almost constantly," according to a new study from Pew Research Center. More than half (56%) of teens—defined in this report as those ages 13 to 17—go online several times a day, and 12% report once-a-day use. Just 6% of teens report going online weekly, and 2% go online less often. (2015a, p. 1)

At a glance, the ramification and corollary of social media would seem innocuous, since the features offered by social media promote utilitarian communication, all of which have been extensively deliberated and discussed across a variety of different researches; however, the potential pitfall of social media could possibly lead to the deterioration of face to face communication. Thus, this research examines preferred means of communication among students, and how students are becoming too reliant on social media, in turn influencing and compromising the quality of face to face interactions. The first research question focused on the students' preference of interaction. The second research question probed on the causes that contributed to why they tend to depend on social media. Lastly, the third research question examined how social media contributes to the quality of face to face interactions.

7.2 Literature Review

The following section provides a brief overview of the literature review done for this paper. Firstly, the literature review studies the preferences of social media or face to face interactions among teenagers, whether teenagers today are avid users of social media or advocates of good old fashioned face to face interactions. Besides

that, the many reasons as to why teenagers tend to rely on social media over face to face interactions were also examined. Lastly, the literature review covers how social media contributes to the deterioration of face to face interaction for the current generation.

7.2.1 *The Preference of Interacting Through Social Media or Face to Face Among Students*

The pervasiveness of social media such as Twitter, Instagram, and Snapchat offers remarkable opportunities for individuals to communicate through social networks (Junco, 2013; Nadkarni & Hofmann, 2012). Given the ubiquity of smartphones among society nowadays, accessing social media has become that much easier. This is supported by the results obtained from the Adobe 2013 Mobile Consumer Survey (2013), stating that accessing social media is the number one mobile activity today. According to an article by Suliveres (2014), human face to face interactions are becoming less important following the emergence of social media among society nowadays. Even so, the preference of interacting through social media or face to face still varies among every student. Based on the research done by Kujath in 2011, social media have become a more common method for interpersonal communications to occur among college students. This is corroborated by another research that stated how social media have attracted a large amount of users, especially from teenagers and university students alike. As suggested by this research, the amount of time spent on SM is more toward socializing rather than learning (Hamat, Embi, & Hassan, 2012). Instead of socializing through physical means, students are instead resorting to social media as the platform for interactions to occur. This obviously indicates the dying art of face to face interaction, which is a serious concern for the future generation.

Another research done by Ahn in (2011) shows that teenagers are among the most prolific users of social media (SM). A number of other researches also state that social media is, in fact, the most popular form of technology and the most common activity among teenagers today (O'Keeffe & Clarke-Pearson, 2011; Reich, Subrahmanyam, & Espinoza, 2012). As the research propounds, since the arrival of the Internet and various social media, students spend large amounts of time online with peers. It also suggested that teenagers use social media to strengthen their off-line relationships with others (Reich et al., 2012). This is well in accordance with a research conducted by Sheldon in (2013) which also states that social media are becoming another platform to initiate and maintain interpersonal relationships. Another research done by Newham in (2012) mentioned that even when face to face communications are happening, Facebook interrupts the communication because people tend to check for updates on Facebook during those interactions. This is consistent with survey results stating that 38% of respondents admitted to sometimes checking Facebook for updates even when they were with friends.

Moreover, 51.3% of the respondents agreed that they would spend more time interacting face to face with others if social media never came to existence. Despite so, most teenagers still insist face to face interaction is still their preferred way to communicate with others (Haris, 2015). In 2012, Common Sense Media report that about half of teenagers concur that their favorite method of communicating with friends is in person, the reason being face to face conversations is more fun, and they can understand what people really mean better in person.

7.2.2 *The Causes of Students' Reliance on Social Media Over Face to Face Interaction*

The use of social media has seen a significant increase in the past decade (Johnson, 2014). This can be illustrated by the amount of monthly active users on Facebook, the most popular social network worldwide. A huge number of 1.55 billion monthly active users on Facebook were recorded as of the third-quarter of 2015, which is more than 20% of the current-world population (Statista, 2016). Recently, social media has become an increasingly popular method for teenagers to communicate with each other (Hamat et al., 2012). Based on the research of Kujath in 2011, social media is a platform that helps in maintaining close interpersonal relationships, but not in creating new relationships. Many researches also show that social media is used as a way to connect with people of similar interests: classmates, peers, or people known from off-line contexts (O'Keeffe & Clarke-Pearson, 2011; Reich et al., 2012). As suggested by Kujath, prior face to face relationships are maintained through the usage of Facebook and MySpace. Apart from that, Kujath also suggests that it is an uncommon thing for a friendship to just happen on social media.

Moreover, another research by Lenhart in (2012) suggests that the easy Internet accessibility provided by mobile phones allows teenagers to be constantly online. In the same vein, another study suggests that social media is used as a filler during free time (Jacobsen & Forste, 2011). In a survey conducted by Pew Research Center, teenagers are frequent users of social media applications on mobile phones, backed by the fact that three-quarters (76%) of teenagers use social media. When asked about the usage of seven popular social media platforms, Facebook, Twitter, Instagram, Snapchat, Tumblr, Google+, and Vine, respectively, 89% of teenagers reported the usage of at least one of the sites, while 71% reported the usage of two or more sites. The social media platforms stated are all available on mobile phones in the form of applications and convenient for teenagers to access at any times especially during free time. With reference to a study by Drago in (2015), 18% of students reported always using their mobile phones or tablets when spending time with friends or family, 74% of students use their mobile phones sometimes when they are with family or friends, and only 8% of students rarely use their phones when with friends and family. The fact that zero respondents said that they never

use their mobile phones when spending time with family and friends indicates how social media is affecting social face to face interactions.

According to a recent study, social media platforms such as Facebook are mainly used as a "social glue" to help new students to settle in their university life (Hamat et al., 2012). This study can be related to another study that suggests about the tendency of teenagers to rely on their peer support more than family support; social media allows them to widen and strengthen their relationships with peers (Smahel, Brown, & Blinka, 2012). In the beginning of university life, things can get tough with assignments piling up and many other issues as well. However, if peer relationships are strong enough, teenagers who are facing problems can always seek their peers for mental support and such. On the other hand, Newham suggested in (2012) that social media usage is affected by an individual's self-esteem. The study shows that a person with high self-esteem tends to spend more time on social media, but communicate with others less through it when compared to a person with low self-esteem. Besides that, the study also shows that it is much more likely for people with low self-esteem to check for social media updates when they are with friends as compared to people with high self-esteem (Newham, 2012). Both findings relate closely due to the fact that a person with low self-esteem may feel more shy when it comes to face to face interactions, hence resorting to social media to avoid any form of awkwardness.

7.2.3 The Contributions of Social Media on the Quality of Face to Face Interaction

Social media has been constantly linked with the deterioration of face to face interaction among teenagers. In a study conducted by Strickland (2014), it was concluded that teenagers or young adults are the most active users of social media. Teenagers would then easily receive both the positive and negative repercussions from the usage of social media. Among the negative effects, one of them would be the deterioration of face to face interactions. For teenagers who already have poor social skills, this could result in them being unable to communicate face to face with anyone, which is a serious issue. Kujath (2011) proposes that whenever social media is used excessively, communication among family members within a household will decrease, and the size of one's social circle reduced. As teenagers constantly indulge in excessive use of social media, the chances of them being overly dependent on the platform are fairly high. Thus, teenagers would use their social media accounts wherever or whenever they can. A recent study by Newham (2012) has stated that plenty of individuals spend more time communicating on social media (SM), primarily on Facebook. Therefore, Newham (2012) concluded that Facebook has replaced face to face communication for many individuals. Therefore, plenty of individuals would find it hard to keep a conversation going when having a face to face conversation due to their dependency on social media, causing them to have poor social skills.

One research conducted by Hamat et al. (2012) states that Facebook is not mainly used for formal teaching purposes. Outside-the-classroom or afterschool programs are where Facebook or other SM are needed to act as a medium for lecturers to advise or educate their students. Unfortunately, some students use SM as a way to avoid face to face interactions with their peers and even their lecturers. These students would prefer to seek help from their lecturers through SM rather than communicating with them face to face, which indicates the deterioration of face to face communication. On the other hand, some students who are allowed to use social media in class become easily distracted (Jacobsen & Forste, 2011). Not only would students be distracted from whatever their lecturers are teaching, they tend to check their social media accounts even when there is no notification whatsoever. Furthermore, they will check their SM every few minutes or so just to keep themselves updated, potentially isolating them from most of the people around them. Based on a research by Smahel et al. (2012), teenagers frequently communicate with friends and strangers through SM. Although teenagers generally depend more on SM to communicate, there is still a minority which still prefers to communicate face to face. This was presented in a research by Sheldon in (2013) that suggests the existence of the SM exclusive type of relationship where communication is only done through SM. Nevertheless, there is also the face to face kind of relationship where only face to face communication took place. Teenagers who depend more on SM to communicate are more prone to speak less to anyone face to face; they use online contexts to strengthen off-line relationships (Reich et al., 2012).

7.3 Research Method

7.3.1 Participants

This study involved the Sunway University's American Degree Transfer Program (ADTP) students during the fall semester of 2015, with ages ranging from 16 to 23 years old. For the online survey, the number of students participated were 94; for the observation, 12 students were involved.

7.3.2 Procedure and Instruments

7.3.2.1 Online Survey

An online survey consisting of demographic section and 18 Likert scale statements constructed on the investigated variables were made using Google Forms. The link was subsequently posted on the Sunway University's American Degree Transfer

Program (ADTP) Facebook page. The online survey consisted of statements that were created for the purpose of this study and was validated through the relevant, existing studies. The statements were published on Google Forms in a form of a survey questionnaire to make it easier for the participants to access and rate the statements. The survey was separated into four sections: Section A, B, C, and D. Section A consisted of the respondent's demographic information such as gender, course, and age. Section B investigated on the students' preference: social media or face to face interaction. Meanwhile, Section C probed on the causes that contributed to why students tend to depend on social media, whereas Section D examined how social media contributes to the quality of face to face interactions.

7.3.2.2 Observation

The observation was conducted to obtain a cogent understanding of the students' behavior as well as gather evidence to validate the assertions made. In this research, the observation involved a group of 12 students, with 6 males and 6 females. During Stage 1 of the observation, the 12 participants were instructed to remain inside a designated classroom for 30 min. They were briefed on the aim of the study and requested to behave naturally in the given context. Throughout Stage 1, we kept track of the participants' behavioral changes, whether they engaged in face to face conversations or started using their mobile devices to access social media. Subsequently, during Stage 2 of the observation, the 12 participants were instructed to interact face to face, and then via social media. Throughout the process, their behaviors were noted to determine whether they deviated from the intended interaction activity. For instance, when the intended interaction was verbal interaction, we observed and recorded the number of participants who accessed social media through their handheld devices.

7.4 Results

7.4.1 Online Survey

This section discusses the results obtained from the survey by analyzing the responses of all the 94 participants. The survey was divided into 4 sections to investigate and probe the intended variables.

7.4.1.1 Section A: Demographic Information

See Tables 7.1 and 7.2.

Table 7.1 Gender

Male	Female
51.6%	48.4%

Table 7.2 Age

Age	Frequency
16	2
17	5
18	22
19	12
20	39
21	6
22	5
23	2
Others	1

7.4.1.2 Section B: Preference of Interacting Through Social Media or Face to Face Among Students

The statements in this section of the survey required the participants to state their preference of interaction between social media or face to face. The statement "I feel more confident talking to people through social media" shows that a majority of the participants feel that they are more confident talking to people through social media, with 55% of them selecting "Strongly Agree" and "Agree" for the statement. However, 63.7% of the participants disagreed when they were asked if they preferred to stay at home and chat online rather than having a face to face conversation. This indicates that face to face interaction is a more preferable method among the participants. The notion is supported by the statement "talking to someone face to face is much better than talking to someone through social media," as 81.4% of the participants showed agreement. At the same time, many participants also responded that they do not prefer to talk more on social media than in person, with 48.9% of the participants agreeing with the statement while only 16.3% of the participants disagreed. A majority of the participants, 46.2%, disagreed with the statement that they have more friends to talk to on social media than in person, which is 24.2% more than those who agree to the statement. When it came to the statement, "face to face interaction allows me to have a better relationship with people," an overwhelming 88.8% of participants agreed. To summarize this section, most of the participants felt more confident talking to people through social media, but still appreciate and prefer face to face interactions more (Tables 7.3 and 7.4).

Table 7.3 Preference of interaction: social media or face to face

Preference of interacting through social media or face to face among students	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
I am more confident talking to people through social media	15.4	39.6	28.6	15.4	1.1
I prefer to stay home and chat online than having a face to face conversation	2.2	6.6	27.5	50.5	13.2
Talking to someone in person is much better than talking to someone through social media	41.8	39.6	15.4	3.3	0.0
I prefer to talk more on social media than in person	1.1	15.2	34.8	39.1	9.8
I have more friends to talk to on social media than in person	4.4	17.6	31.9	34.1	12.1
Face to face interactions allow me to have a better relationship with people	52.8	36.0	7.9	2.2	1.1

Table 7.4 Statistics of response for Section B

	Percentage (%)	Mean	Standard deviation
Strongly agree	117.7	19.6	20.4
Agree	154.6	25.8	13.1
Neutral	146.1	24.4	9.5
Disagree	144.6	24.1	18.3
Strongly disagree	37.3	6.2	5.6

7.4.1.3 Section C: Causes of Students' Reliance on Social Media Over Face to Face Interaction

The statements in this section were devised to examine what causes students to rely on social media over face to face interactions. Firstly, 47.8% of the participants felt that social media allows them to portray themselves differently, whereas 19.5% felt otherwise. Despite that many participants do not feel that social media is more interesting than reality, with only 28.7% of the participants agreeing to the statement. Moreover, the percentage of participants who felt that they have more freedom of speech is only 8.8% more than those who do not, but 38.5% of them were indifferent, or "Neutral," to the notion. For the statement "social media makes me less shy," more than half the participants, 51.6%, agreed to it. However, when the participants were asked whether it is difficult for them to keep a conversation

Table 7.5 Causes of students' reliance on social media over face to face interaction

Causes of students' reliance on social media over face to face interaction	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Social media allows me to portray myself differently	13.0	34.8	32.6	15.2	4.3
I feel that social media is more interesting than reality	0.0	28.7	27.7	33.0	10.6
I have more freedom of speech on social media	6.6	28.6	38.5	20.9	5.5
Social media makes me less shy	9.7	41.9	29.0	16.1	3.2
It is difficult for me to keep a conversation going face to face	9.7	18.3	29.0	35.5	7.5
I feel like social media helps my self-esteem to be better	3.3	20.7	42.4	28.3	5.4

Table 7.6 Statistics of response for Section C

	Percentage (%)	Mean	Standard deviation
Strongly agree	42.3	7.1	4.4
Agree	173.0	28.8	8.0
Neutral	199.2	33.2	5.5
Disagree	149.0	24.8	7.9
Strongly disagree	36.5	6.2	2.6

going face to face, 43% of the participants disagreed to the statement as compared to only 28% who agreed. As for last statement, most of the participants, 42.4%, expressed neutrality to the statement that social media helps improve self-esteem. It can be summarized that most of the participants rely on social media because it allows them to portray themselves differently and makes them feel less shy (Tables 7.5 and 7.6).

7.4.1.4 Section D: The Contributions of Social Media on the Quality of Face to Face Interaction

The statements in this section target the contributions of social media on the quality of face to face interactions among students. First of all, participants were asked if they became more sociable during face to face after starting to use social media, to which most of the participants, 40.4%, were indifferent to the statement. Secondly, an astonishing 79.8% of the participants felt that their relationship with distant

friends becomes better after using social media. Furthermore, 33.3% of the participants disagreed that the usage of social media gave them more confidence in talking to strangers face to face as compared to a mere 19.3% that thought otherwise. As for the next statement, 76.6% of the participants felt disconnected when friends use their mobile phones around them. A statement which a majority of the participants were against was "I rarely go out to meet my friends because I can talk to them at home through social media," yielding a total of 69.9% which disagreed. Finally, 77.1% of the participants, which is more than half, did not start avoiding more face to face interactions with people ever since creating a social media profile. To summarize the section, social media contributes on the quality of face to face interaction by which the quality of relationship with distant friends among students is improved. However, students still feel disconnected with people that use mobile phones when being physically close. Nevertheless, students do not use social media as a means to avoid face to face interaction (Tables 7.7 and 7.8).

Table 7.7 Contributions of social media on the quality of face to face interaction

The contributions of social media on the quality of face to face interaction	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
I have become more sociable during face to face after starting to use social media	2.1	25.5	40.4	26.6	5.3
My relationship with my distant friends becomes better after using social media	30.9	48.9	17.0	3.2	0.0
I have more confidence talking to strangers face to face ever since I have started using social media	3.2	16.1	45.2	30.1	3.2
When I see my friends on their phones and I am around them, I feel disconnected even though we are only two feet apart	34.0	42.6	17.0	5.3	1.1
I rarely go out to meet my friends because I can talk to them at home through social media	0.0	11.8	18.3	46.2	23.7
I have started to avoid more face to face interaction with people ever since I've made a social media profile	1.1	7.6	14.1	47.8	29.3

Table 7.8 Statistics of response for Section D

	Percentage (%)	Mean	Standard deviation
Strongly agree	71.3	11.9	14.6
Agree	152.5	25.4	15.5
Neutral	152.0	25.3	12.5
Disagree	159.2	26.5	17.6
Strongly disagree	62.6	10.4	11.6

7.4.2 Observation

The observation was carried out with a group of 12 students (6 males and 6 females) with the aim of better understanding the students' behavior and validating the assertions made in the study. These volunteers were selected randomly from ADTP of Sunway University to participate in the 30-min observations. Throughout the process, observations were recorded at 5-min intervals.

7.4.2.1 Stage 1

During Stage 1 of the observation, the group of participants were instructed to perform their normal daily activities. Subsequently, we observed the number of people who were verbally interacting and the number of people who were using their handheld devices to access social media.

Table 7.9 shows the results of our observation on the group of 12 participants during Stage 1 where they were instructed to engage in usual daily activities. Readings were taken at 5-min intervals. During the first 5 min, students were mostly interacting with each other verbally, with 8 out of 12 students doing so, while only 1 student was using social media. For the following 5 min, the number of students accessing social media increased to 2. After 15 min of observation, the number of students that engaged in verbal interaction increased to 10, whereas the number of students on social media remained at 2. By the 20th minute, the number of students engaged in verbal interaction reduced to 8, while the number of students on social media increased by 1. Then, 25 min into the observation, we found an

Table 7.9 Number of students (out of 12) engaging in interaction activity

Duration	Social media	Verbal interaction
0–5 min	1	8
6–10 min	2	8
11–15 min	2	10
16–20 min	3	8
21–25 min	6	6
26–30 min	10	2

increase in number of students using social media to 6, whereas the number of students on verbal interaction further reduced to 6. By the end of the observation, 10 students were using social media, and only 2 remaining who were having verbal interaction. Thus, it should be noted that 83% of students were accessing social media by the 30th minute.

7.4.2.2 Stage 2

As for Stage 2 of the observation, we first instructed the 12 participants to interact verbally, then via social media, for 30 min, respectively. We observed the group to determine the number of people who deviated from the intended choice by engaging in the opposite activity.

Table 7.10 shows the results for Stage 2 of the observation where the intended interaction was verbal interaction. The observation was initiated with no student using social media. During the first 5 min, only 1 student stopped engaging in verbal interaction and spent time on social media. After 10 min, the number of students that switched from the intended interaction to social media increased to 2. The following 5 min, the number of students that stopped engaging verbally increased to 4. By the 20th minute, the number decreased to 2 as they started interacting verbally again. After 25 min, the number of students that deviated from intended interaction saw a slight increase of 1. At the end of the observation, 6 students were engaging on social media. It is noteworthy that at this point of the observation, 50% of students deviated from the intended verbal interaction to use social media.

Table 7.11 illustrates the results for Stage 2 of the observation where the intended interaction was social media. During the first 5 min, 1 student stopped using the intended means of interaction which was social media, and interacted verbally with others. The subsequent 5 min, 2 students deviated from social media to interact face to face. After 15 min, no student was interacting verbally. By the 20th minute, the number of students on verbal interaction increased to 3. After 25 min, the number decreased to 2 as 1 student stopped interacting verbally and resumed to using social media. At the end of the observation, no student was interacting verbally, making all 12 students engaging on social media. Herein, it should be noted that 100% of students were using social media after the observation.

Table 7.10 Number of students (out of 12) deviating from verbal interaction

Duration	Social media
0–5 min	1
6–10 min	2
11–15 min	4
16–20 min	2
21–25 min	3
26–30 min	6

Table 7.11 Number of students (out of 12) deviating from social media

Duration	Verbal interaction
0–5 min	1
6–10 min	2
11–15 min	0
16–20 min	3
21–25 min	2
26–30 min	0

Thus, it can be summarized that the findings from both Stage 1 and Stage 2 of the observation show that students inevitably resort to social media when situated in social contexts.

7.5 Discussion

The findings yielded from both the survey and the observation indicate that the students prefer face to face interaction over social media to some extent. For instance, the statement "I feel more confident talking to people through social media" tells us that teenagers spend a lot of time interacting through a screen rather than real life. Therefore, it affects their concentration and self-esteem and, in many cases, significantly impacts their personal relationship. Often times, they may lose the ability to be sympathetic and empathetic (Johnson, 2014). However, it is noteworthy to mention that the previous statement given contradicts the fact that teenagers prefer face to face interaction, as evident by the statement "face to face interactions allow me to have better relationships with people." Nevertheless, in some cases, teenagers actually prefer social media because it helps them to have better relationships with peers, and consequently encouraging more face to face interactions (Lenhart, 2015b).

Based on the findings, it can be deduced that teenagers tend to rely on social media due to a couple of reasons. For example, the statement "social media allows me to portray myself differently" indicates that teenagers project themselves differently from how they are in reality. In this context, teenagers manage different identities both online and off-line. According to Green (2013), an individual's identity online eliminates a part of an individual's real-life component. Furthermore, the statement "social media makes me less shy" suggests that social media has the ability to inhibit shyness among teenagers. For instance, social media would provide a platform for them to be socially comfortable before they begin engaging in real-life conversations. In addition, social media allow teenagers to observe and learn without contributing to the exchange of ideas happening online (Carducci & Kaiser, 2015). Henceforth, the findings clearly show that teenagers rely on social media due to these reasons.

Apart from the tendency to rely on social media, another variable probed in the study was how social media affects the quality of face to face interaction. The

statement "my relationship with my distant friends becomes better after using social media" indicates that social media actually improve the quality of face to face interaction. Moreover, one study stated that the more you communicate with people through social media on your devices, the more likely you are to communicate with them face to face (Adler, Proctor II, & Proctor, 2015). Therefore, this explains why most of the respondents disagreed to the statement "I have started to avoid more face to face interaction with people ever since I've made a social media profile."

Lastly, based on the results obtained from the observation, it can be concluded that teenagers have no problem engaging in face to face interactions. However, it can be postulated that as the duration of the observation progresses, the teenagers perhaps experience boredom or lack of mutual interest in conversation and therefore resorted to the use of social media. Leung (Leung 2006) remarks that bored individuals will seek out for entertainment or stimulation from Internet use, typically social media. At this juncture, the findings suggest that when placed in unfamiliar social contexts, teenagers invariably engage on social media rather than face to face interaction.

7.6 Recommendation

After conducting the study, we realized there are ways that we can improve the results. Firstly, having a larger number of respondents for the survey conducted would give us more accurate results. Our study was limited to only students of Sunway University's American Degree Transfer Program (ADTP), which is not the full representation of all students or teenagers alike. Therefore, conducting the survey on a greater population of students outside of Sunway University can provide us with better insights for the study. Secondly, briefing the participants the rules before conducting the observation would have prevented them from leaving the room during the period. This would have produced more reliable results as we cannot be certain what the participants are doing when they were not physically in the room. Thirdly, a longer period of observation would have provided a cogent understanding of the participants' behaviors and thus better results.

7.7 Conclusion

Beginning of the study, we hypothesized that social media contributes to the deterioration of face to face communication among students of Sunway University's American Degree Transfer Program (ADTP). Students typically have at least one social media account as technology progressively becomes easier to access. We started the study with three research questions in mind. The first research question focused on the students' preference when it comes to interacting. The second research question probed on the causes behind the students' dependency on social

media. Lastly, the third research question examined how social media contributes to the quality of face to face interaction. The results obtained indicate that the students prefer having face to face interaction over social media. Furthermore, we examined the causes as to why students rely on social media. A majority of survey respondents agreed that social media allow them to portray themselves differently and be less shy. On top of that, we examined how social media contributes to the quality of face to face interaction. The findings acquired indicate that social media contributes to the quality of face to face interaction especially in distant relationships. Finally, the findings yielded from the observation contradict with the overall notion obtained from the survey. This suggests that the students are more inclined to using social media when situated in social contexts.

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Chapter 8
The Mediating Role of Shadow Education (SE) Participation on Goal Orientation, Study Habits, Connectedness, and Academic Performance

Rosalina M. de Guzman, Socorro M. Rodriguez and Belinda V. de Castro

Abstract This study purports to determine the mediating role of SE participation on four variables, namely goal orientation, study habits, connectedness, and academic performance involving 267 elementary and high school student respondents, and simultaneous relationships between and among these variables were examined through structural equation modeling. Results revealed that the higher the student desire to improve his study habits and the less he is connected to his family and friends the more likely he will participate. However, the more he is connected to his family and friends and the higher his goal orientation the more likely his academic performance will improve Academic achievement in this study is not supported by participation in shadow education or private tutorial, but a more connected environment and a more positive goal orientation will lead to improvement in academic performance.

Keywords Tutoring · Academic performance · Study habits

8.1 Introduction

Shadow education (SE) is a global phenomenon wherein pervasiveness varies from 10 to over 80% (Southgate, 2009). In Turkey, SE is a widespread practice that has spawned a multibillion dollar industry helping students to pass highly competitive entrance examinations. About 1.3 million children in Turkey are enrolled in more than 3,800 tutorial colleges (Finkel, 2013). Asian Development Bank (ADB, 2012)

R.M. de Guzman · S.M. Rodriguez (✉)
Saint Michael's College of Laguna, Biñan, Laguna 4024, Philippines
e-mail: socmrod_gs@yahoo.com

B.V. de Castro
University of Santo Tomas, Manila, Philippines
e-mail: bvdecastro@ust.edu.ph

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noted that Japanese families spend an estimate of $12 billion on private tutoring annually while in Pakistan, expenditures on tutoring per child averaged an equivalent of $3.40 a month, a significant amount considering 60% of Pakistan's population reportedly lives on less than $2 per day. Notably, it was reported that around 58.8% of Grade 10 students in India and 32% of primary students in Vietnam was receiving tutoring. In Malaysia, a survey revealed around 20.1% of the households indicated expenditures on private tutoring. The same is true in the Philippines, Cambodia, and Myanmar.

Shadow education (SE) refers to "supplemental, privately funded academic lessons outside of school" (Southgate, 2009), the preparation for a forthcoming exam in a more rigid manner (Chou & Yuan, 2011; Bray, 2009). Shadow education also known as cram schools is specialized social institutes that prepare student for tests in a more efficient and marketable manner (Huang, 2004). It is not just remedial help, it is about "competition and creation of differentials" (ADB, 2012). In Istanbul, "shadow education is an academic jargon for the way ordinary people bypass the failings of the formal school system by enlisting their children in special programs" (Finkel, 2013).

While there had not been a plethora of studies that directly measure the effects of shadow education (SE) on its clientele, a number of completed studies on its impact suggest that private tutoring has positive effects on the academic achievement of the students. Sawada & Kobayashi (1986) posited that students attending juku (Japanese cram schools) incurred higher scores on problems that involved arithmetic calculations and algebra, but not in arithmetic applications and geometry. In Taiwan, SE participation tends to raise students' academic performance and test scores which created an enormous amount of pressure on parents to have their children avail of such services (Chou & Ching, 2012). It is considered as an educational investment as a way to attain upward social mobility, since it helps accumulate cultural and psychological capital for the student. Consequently, parents and students find legitimate reasons to spend money for SE participation (Ho Nga Hon, 2010).

There is no doubt that SE has made considerable contribution to supplementary education but its negative impact cannot be set aside. This may be brought about by the negative perceptions of traditional schooling and the belief that private tutoring is essential for academic success. However, some studies show that it is not always effective. In some schools, students commonly skip classes or sleep through their lessons because they are tired after tutorial sessions. This shows that the shadow system can make regular schooling less efficient (The Express Tribune, July 5, 2012). The growth of private tutoring in the formerly socialist countries, Lithuania, Mongolia, Poland, Slovakia, and Ukraine, may indicate inadequacies in the education systems. While in Asia, private tutoring seems to dominate the lives of young people and their families, creating inefficiencies in education systems and social inequalities, diverting needed household income into an unregulated industry.

Cambodia and Singapore may have different cultures and economic structures, but both of these countries are facing the SE phenomenon. On the one hand, Cambodia is a less-developed country in which teachers have low levels of

professional development where SE has become a common way for regular teachers to supplement their income. As in other low-income countries such as Azerbaijan and Bangladesh, it has become acceptable for teachers to demand payment for extra tutoring of pupils for whom those teachers already have responsibility in the mainstream classes. This raises "major challenges, including the possibility of a form of blackmail wherein teachers withhold parts of their regular lessons in order to increase the market for private tutoring" (Bray, 1999b, p. 61; Dawson, 2009, p. 65). On the other hand, teachers in Singapore are well remunerated, are more closely supervised, and have much higher standards of professionalism. Teachers are forbidden to tutor pupils from the schools in which those teachers are already employed, yet tutoring is still common in Singapore (Tan, 2009). The nature and providers of tutoring differ considerably from the dominant form in Cambodia. Singapore has many more commercial agencies which specialize in tutoring and makes use of the Internet and other technologies for this purpose to a much greater extent than in Cambodia. Similarly, proliferation and pervasiveness of SE in countries such as Hong Kong, Taiwan, Korea, and Japan, where diverse cultural norms and economic structures thrive, may be due to the influence of the Confucian culture which value learning, effort, and competition (Bray, 2012).

8.1.1 Shadow Education in the Philippines

To avail of tutorial services, particularly in the basic education level, for the purpose of improving academic performance is not a new phenomenon in the Philippines (de Castro & de Guzman, 2010). This scenario reflects the Filipinos' high regard for education as the primary means for social and economic mobility (NSO FIES, 2007). Pervasiveness and continued patronage of Filipinos of this service industry was apparently evident in three syndromes depicting its metamorphosis in the country: the *lean on,* the *pass on*, and the *ride on syndromes* of private tutoring (de Castro & de Guzman, 2012). Initially, it was intended to serve slow and low achieving students. Similar to other countries where this service industry is prevalent. (Baker and LeTendre, 2005; Ventura, 2008b) noted that SE is used to augment the students' capacities and satisfy the requirements of the formal school. Parents make use of this service industry to delegate their responsibility to the private tutors. "Parents may not be fully aware of the benefits their children get from availing SE, still they patronize private tutoring due to the social influence imbedded in the Filipino culture that plays a critical part in their decision" (de Castro & de Guzman, 2010).

This study intends to determine the status of SE in the Philippine setting. Since participation is more prevalent in basic education, it seeks to specifically determine the mediating role of SE participation on goal orientation, study habits, connectedness, and academic performance in a basic education institution in the country. Additionally, it seeks to identify the nature, reasons, and extent of participation of

the students during their turning points, in the Grades 5 and 6 levels for the elementary years and the third and fourth year high school levels.

8.1.2 Theoretical Framework

The study is anchored on Guttman's (1982) means-end chain theory. The theory explains how consumers make decisions in the selection of services and explain the ultimate goal by which they base their decisions. Its main assumption is that consumers do not avail of services only for the sake of the service but for the benefits that they can get out of it. This means that the consumer is more concerned on the functionality and psychological consequences of the service availed rather than its features. Consequently, the consumer will consider availing of the service as long as it will provide greater opportunity of realizing his goals.

In the context of shadow education, student clientele seems to be goal-oriented decision makers who will choose to avail of shadow education that will eventually lead to their desired outcomes, that is, to perform better academically. However, their goals vary depending on their socioeconomic status. The higher the social and economic status of the family, the higher the education expectations (Chou & Yuan, 2011). Families with high levels of cultural capital and high levels of social capital are more likely to purchase shadow education compared to families with lower levels of capital (Southgate, 2009). "Tutoring is a way of attaining upward social mobility, while the middle class families wish to remain as social elites" (Bray & Kwok's, 2003:616). Confucian traditions emphasize effort as a key to success, "more studying means more success" (Bray, 1999). Most students who avail of services of shadow education want to pass examinations in a more intensive way, or studying a subject hastily (Chou & Yuan, 2011).

8.1.3 Research Problem and Hypotheses

Shadow education clienteles' problems with academic performance and their perceived quality of education received from secondary school caused the efficacy-orientation attitude of its clientele (de Castro, 2014). The current study focuses on the mediating role of SE participation on goal orientation, study habits, connectedness, and academic performance. Specifically, the study tested the conceptual model that considers three factors, the study habits and goal as the personal factor and the connectedness as environmental factor for successful academic performance, and the SE participation as dependent variables (Fig. 8.1).

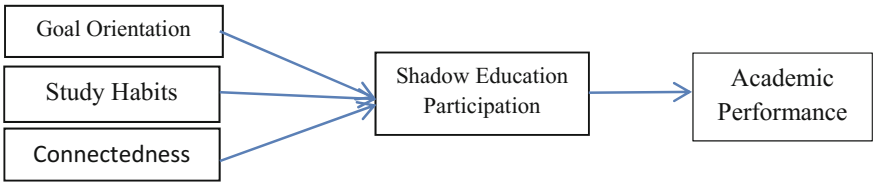

Fig. 8.1 Mediating role of shadow education participation in the academic performance of basic education students

8.1.3.1 Goal Orientation

The reasons for private tutoring vary from students/parents and private tutors. For students/parents, private tutoring is a way of competing to become social elites. It is an educational investment for future success, since it helps accumulate cultural and psychological capital for students. Students/parents in every family can, therefore, find legitimate reasons to spend money on private tutoring. As for private tutors, it is economic consideration (Southgate, 2009).

H_1: The higher the goal orientation of the student, the more he will participate in shadow education.

8.1.3.2 Study Habits

The study of Southgate (2009) revealed that shadow education is used for struggling students and not for high-performing students, and all nations employ a remediation strategy when considering tutoring apart from formal learning centers. It can be observed that while most tutoring is delivered by the private sector, there is also some public sector involvement through extracurricular activities offered by schools and community organizations (Ireson, 2004). Many schools provide extracurricular activities, some of which have a curriculum focus, such as math club. These activities are included in the government definition of "Study Support" (DfEE, 1997) together with other activities, such as sports, arts, and drama that support academic development indirectly.

Tutoring reduced test anxiety and increased learner motivation (Mischo & Haag, 2002). Additionally, it improved the students' attitudes in school and better attendance (MacBeath et al., 2001). In Year 11, drop-in sessions and subject-focused study support were associated with better attendance and achievement (Ireson et al., 2004). Extracurricular activities helped students to have a sense of belonging to school (Gerber, 1996).

H_2: The better the study habits of the student, the lesser is his participation in shadow education.

8.1.3.3 Connectedness

In West Indian supplementary schools, parents are also involved in their children's education, helping them with their homework and participate in educational activities both in school and in the community. They listen to their children reading schoolbooks at home and help with mathematics and spelling (West et al., 1998). Some parents interact in ways similar to the teachers "when listening to their children read (Greenhough & Hughes, 1998). In effect, many parents are able to tutor their children themselves and may not feel the need to employ tutors from outside the family. Parents who are teachers are likely be able to tutor, and the other members of the family or friends may also be able to tutor for free (Ireson, 2004).

H_3: The more the student is connected to his family, relatives, and peers, the lesser he will participate in the shadow education activities.

8.1.3.4 Academic Performance

The pervasiveness and proliferation of private tutoring can be attributed to its potential impact on the academic performance of the students. Lee et al. (2010) surmised its positive impact on the duration of SE participation. This professionally customized service characterized by coverage and repetition of subject matter learned in school (Kim, 2004) has prompted the students to make use of their time wisely. However, it does not necessarily imply that private tutoring contributed to the development of the critical thinking and self-directed learning capabilities of the students (Lee, 2005; Kim, 2003). Thus, it could be hypothesized that

H_4: The more a student participates in shadow education, the better is his academic performance.

8.2 Method

8.2.1 Subjects and Study Site

Out of 267 elementary and high school students who responded in the study, 28.4% is 12 years old and below and 54.8% is 13–14 years old. The respondents are enrolled during the school year 2014–2015 in Saint Michael's College of Laguna, a private higher education institution with a population of about 1,900 elementary and high school students.

8.2.2 Instrumentation and Data Collection

A three-part questionnaire was fielded to the respondents. The first part is about the demographic profile of the students, while the second part deals with the availing of private tutoring in terms of duration, frequency, mode of availing, type of service provider, amount spent for tutorial services, reasons, and improvement in terms of academic performance. The third part consisted of the four variables investigated which are study habits, goal orientation, connectedness, and academic achievement. After the questionnaire had been tested for reliability and validity, it was fielded during the months of February and March. A total of 300 questionnaires were fielded regardless of whether they availed of tutorial services or not.

8.2.3 Data Analysis

Data were analyzed using frequency, percentage, and factor analysis using the Statistical Package for Social Sciences (SPSS v 17) to determine the underlying dimensions of stress, goal orientation, and connectedness. Simultaneous relationships between and among latent and manifest variables were examined through structural equation modeling using AMOS 19 which combines confirmatory factor analysis and multinomial regression analysis. Maximum likelihood estimation was employed to determine parameters and fit indices that adjudge model fit and parsimony. Decision rule used to determine the acceptability of the model includes CMIN/df between 2 and 3, RMSEA $\leq$ 0.08, and NFI, CFI and GFI $\geq$ 0.80 (Ferron & Hess, 2007).

8.3 Results

Table 8.1 shows the demographic profile of the respondents. More than half of the respondents are 13–14 years of age (55.06%), female (51.69%) and belong to small family of 1–3 siblings (67.42%). A greater percentage of them is the eldest in the family (40.82%) whose parents are college graduates (father = 62.55%, mother = 56.18%) and working in the country (father = 72.66%, mother = 73.41%). More than half of the student respondents perceived to have a good (50.56%) to very good (22.47%) economic welfare of the family.

Table 8.2 shows details of the student respondents' participation in private tutoring. Only 26% is availing tutorial services during their first years in the elementary (8.6%) and secondary levels (10.1%) and as needed (16.4%) for the mathematics subject (9.3%) provided by teachers from their school (12.5%). Most of those who avail of tutorial services pay Php 100–Php 200 per hour or Php 1000–Php 2000 per month. The main reason for availment of tutorial services is for

Table 8.1 Demographic profile of student respondents (N = 267)

Profile	N	%	Profile	N	%
Age			Economic welfare of the family		
12 and below	76	28.46	Very good	60	22.47
13–14	147	55.06	Good	135	50.56
Gender			Medium	64	23.97
Male	128	47.94	Bad	2	0.75
Female	138	51.69	Very bad	0	0.00
Number of siblings			Family monthly income		
Only child	29	10.86	Php 10,000 and below	82	30.71
1–3	180	67.42	>Php 10,000 to Php 20,000	72	26.97
4–6	65	24.34	>Php 20,00 to Php 30,000	46	17.23
7 and above	7	2.62	>Php 30,000 to Php 40,000	24	8.99
Ordinal position			>Php 40,000 to Php50,000	13	4.87
Eldest	109	40.82	>Php 50,000 to Php 60,000	6	2.25
Youngest	51	19.10	>Php 60,000 to Php 70,000	5	1.87
Middle	77	28.84	>Php 70,000 to Php 80,000	3	1.12
Father's educational attainment			>Php 80,000 to Php 90,000	2	0.75
Elementary	6	2.25	>Php 90,000 to Php 100,000	2	0.75
Secondary	80	29.96	>Php 100,000	0	0.00
College	167	62.55	Mother's educational attainment		
MA/MS/PhD	10	3.75	Elementary	11	4.12
Father's professional occupation			Secondary	92	34.46
Non-academician professionals	59	22.10	College	150	56.18
Academicians	6	2.25	MA/MS/PhD	12	4.49
Clerical workers	47	17.60	Mother's professional occupation		

(continued)

Table 8.1 (continued)

Profile	N	%	Profile	N	%
Skilled/unskilled workers	105	39.33	Non-academician professionals	35	13.11
Unemployed	27	10.11	Academicians	18	6.74
Retired	15	5.62	Clerical workers	38	14.23
Father's place of work			Skilled/unskilled workers	40	14.98
In the Philippines	194	72.66	Unemployed	111	41.57
Abroad	58	21.72			
Mother's place of work					
In the Philippines	196	73.41			
Abroad	26	9.74			

Table 8.2 Descriptive statistics of the respondents' availment of tutorial services

Response	N	%	Response	N	%
Avail of tutorial services			Tutorial service provider		
Yes	170	26.1	Teacher in school	33	12.3
No	187	69.8	Teacher outside	16	6
Grade or year of availment			Teacher in tutorial center	4	1.5
Grade 1	23	8.6	College	3	1.1
Grade 2	16	6	High school	4	1.5
Grade 3	11	4.1	Amount spent for tutorial services		
Grade 4	6	2.2	Php 100 to Php 200 per hour	22	8.2
Grade 5	6	2.2	Php 200 to Php 300 per hour	8	3
Grade 6	11	4.1	Php 400 to Php 500 per hour	7	2.6
Year 1	27	10.1	Php 1000 to Php 2000 per month	16	6.7
Mode of availment			Php 2000 to Php3000 per month	3	1.1
Continuous	21	7.8	Php 4000 to Php 5000 per month	1	0.4
As need arises	44	16.4	Reasons for availment		
Frequency (per week)			Assignment, projects, reports	24	9
Daily	17	6.3	Prepare for examinations	21	7.8
Twice	9	3.4	Do not understand what teacher	2	0.7
Four	16	6	teach		
Once	9	3.4	To have friends outside school	2	0.7
Others	4	1.5	Limited knowledge of family members	1	0.4
Subject for tutoring					
Elementary			Improvement in academic performance		
Math	25	9.3	Yes	62	23.1
Science	5	1.9	No	8	3
English	5	1,9			
Secondary					
Math	17	6.3			
Science	5	1.9			
English	4	1.5			

assignments/reports/projects (9%) and for the improvement of their academic performance (23.1%).

Underlying dimension of social and economic factors offered by private tutoring.

Exploratory factor analysis using the principal component method with varimax rotation was applied to the 39 study habit indicators (Table 8.3) and 29 connectedness indicators (Table 8.4) to identify their underlying dimensions for the

Table 8.3 Factor analysis results of study habits

Study habits factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
Factor 1: goal-oriented		5.13	12.87	0.924
I memorize key words to remind of important concept in this class	0.738			
I try to understand the material in this class by making connections between the readings and the concepts from the lectures	0.716			
I try to identify students in this class whom I can ask for help if necessary	0.688			
When I cannot understand the material in a subject, I ask another student in this class for help	0.688			
When reading for this class, I try to relate the material to what I already know	0.678			
Even when lessons are dull and uninteresting, I manage to keep working until I finish	0.657			
I ask the instructor to clarify concepts I do not understand well	0.639			
When I become confused about something I'm reading for a subject, I go back and try to figure it out	0.597			
Whenever I read or hear an assertion or conclusion in this class, I think about possible alternatives	0.563			
I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for a subject	0.553			
I memorize key words to remind of important concept in this class	0.540			
I make lists of important items for this course and memorize the lists	0.478			
I try to change the way I study in order to fit the subject requirements and the instructor's teaching style	0.408			
I often find that I do not spend very much time on my studies because of other activities	0.404			
Factor 2: organization-oriented		2.75	12.62	0.878
I make simple charts, diagrams, or tables to help me organize course material	0.789			

(continued)

Table 8.3 (continued)

Study habits factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
When reading a lesson, I make up questions to help locus my reading	0.688			
Before I study new lesson thoroughly, I often skim it to see how it is organized	0.651			
I ask myself questions to make sure I understand the material I have been studying in this class	0.627			
I treat the subject material as a starting point and try to develop my own ideas about it	0.575			
If I get confused taking notes in class, I make sure I sort it out afterward	0.544			
When studying for a subject, I often set aside time to discuss the topic with a group of students from the class	0.94			
Factor 3: assistance-oriented		1.73	11.14	0.809
I have a regular place set aside for studying where I can concentrate on my course work	0.647			
I rarely find time to review my notes or readings before an exam	0.545			
When a theory, interpretation, or conclusion is presented in class or in the readings, I try to decide if there is good supporting evidence	0.529			
When I study the readings for a subject I write brief summaries of the main ideas from the readings and my class notes, to help me organize my thoughts	0.515			
When studying for a subject, I often try to explain the material to a classmate or a friend	0.513			
I often find myself questioning things I hear or read in a subject to decide if I find them convincing	0.457			
Factor 4: difficulty-oriented		2.06	10.90	0.772
When course work is difficult, I either give up or only study the easy parts.	0.733			
When studying for a subject, I try to determine which concepts I do not understand well	0.696			
I often find that I have been reading for this class but do not know what it was all about	0.617			

(continued)

Table 8.3 (continued)

Study habits factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
I find it hard to stick to a study schedule	0.587			
I often feel so lazy or bored when I study for a subject that I quit before I finish what I planned to do	0.562			

Kasier Meyer Olkin measure of sampling adequacy = .931; *Bartlett's test of sphericity* = 4275.825

purpose of data reduction. Prior to factor analysis, the Kasier Meyer Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were applied to test fitness of data. KMO values (0.931 and 0.881, respectively) proved adequacy of the sample and Bartlett's test of sphericity (4275.825 and 3241.339, respectively), with a significance level of 0.001 likewise supported the use of factor analysis.

Reliability coefficient (Cronbach Alpha) was computed for each factor dimension to determine the internal consistency of the items in each scale. All factors with 60% and above reliability coefficients were considered acceptable in the study. Final reduction in the number of items was done by discarding all items the factor loadings and communalities of which are less than 0.40.

Study habits indicators (Table 8.3). Factor 1 labeled as goal-oriented habits refers to the students use of specific goals/objectives as motivations to learn lessons well. Factor 2, organization-oriented habits, refers to student's ability to employ a more organized and systematic approach effective system in their studies. Factor 3, assistance-oriented habits, describes a student's dependence to external help coming from people around him or from certain study techniques which can make him learn better. Factor 4, difficulty-oriented, describes a laissez-faire orientation in their studies, that is, their attitude of choosing an easier way for them to study no matter what the result is.

For the connectedness dimension (Table 8.4), Factor 1, trust-oriented dimension, refers to judgment or faith of students on their parents, family members, and other people close to them. Factor 2, family-oriented dimension, refers to fun with the family. Factor 3, friendship-oriented dimension, refers to close friends. Factor 4, value-oriented dimension, refers to importance given to certain people, things, and action. Factor 5, distraction-oriented dimension, refers to things that divert your attention.

Goal orientation revealed two dimensions. Factor 1, the competitiveness dimension, refers to the student respondents desire to be at par with the other students since they do not want to be left behind. Factor 2, the success dimension, is more focused on improving one's self as part of their self-actualization (Fig. 8.2; Table 8.5).

The hypothesized model consists of four hypotheses involving three latent variables: study habits (H1), goal orientation (H2), and connectedness (H3) as

Table 8.4 Factor analysis results of connectedness

Connectedness factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
Factor 1: trust-oriented		2.52	12.87	0.928
My parents and I get along well	0.800			
My family has fun together	0.707			
It is important that my parents trust me	0.705			
Always try hard to earn my teachers' trust	0.592			
My parents and I disagree about many things	0.514			
I try to get along with my teachers	0.514			
Factor 2: fun with family/family-oriented		2.89	12.62	0.909
I have a lot of fun with my brother(s) or sister(s)	0.880			
Feel close to my brother(s) or sister(s)	0.870			
I care about my parents very much	0.840			
I enjoy spending time with my brothers/sisters	0.808			
Factor 3: friendship-oriented		2.14	11.14	0.864
My friends and I talk openly with each other about personal things	0.796			
Spending time with my friends is a big part of my life	0.769			
I spend as much time as I can with my friends	0.760			
I rarely fight or argue with the other kids at school	0.580			
Factor 4: value-oriented		2.77	10.90	0.676
I care what my teachers think of me	0.744			
I try to spend time with my brothers/sisters when I can	0.739			
I usually like my teachers	0.711			
I enjoy spending time with my parents	0.706			
I am liked by my classmates	0.581			
My friends and I spend a lot of time talking about things	0.566			
Factor 5: distraction		1.83	9.87	0.843
My classmates often bother me	0.708			
I try to avoid being around my brother/sister(s)	0.636			
Spending time with friends is not so important to me	0.586			

(continued)

Table 8.4 (continued)

Connectedness factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
I like pretty much all of the other kids in my grade	0.548			
I do not get along with some of my teachers	0.526			

Kasier Meyer Olkin measure of sampling adequacy = .881*; Bartlett's test of sphericity* = 3241.339

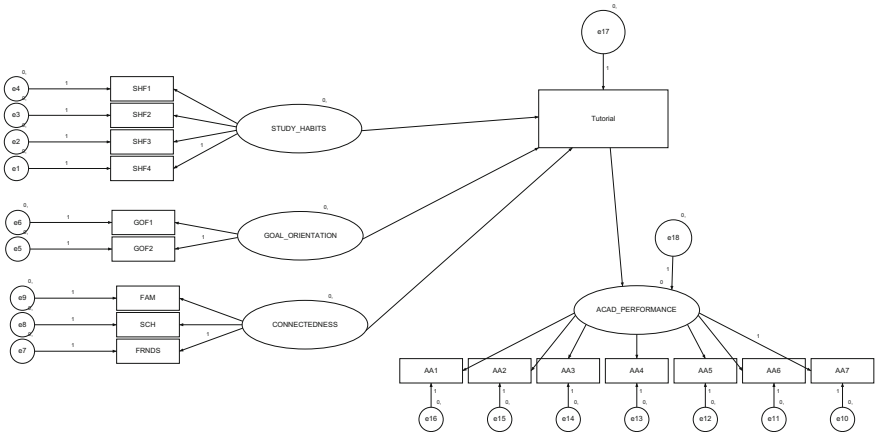

Fig. 8.2 Hypothesized model

exogenous variables, representing the factors that shape students' decision to avail of tutorial services. Additionally, the latter variable, which serves as the mediating variable is assumed to have a positive effect on the students' academic performance (H4) (Fig. 8.3).

8.3.1 The Emerging Model

The use of structural equation modeling supported two out of the four hypotheses and emerged two causal and three noncausal relationships. Among the latent exogenous variables, study habits (H1) proved to have a positive effect (β = 0.196), while connectedness (H2) proved to have a negative effect (−0.203) on the students' decision to avail of tutorial services. This indicates that the more the students want to improve his study habits and the less he is connected to his family, school, and friends, then the more likely he will avail of tutorial services. Students goal orientation did not prove to be mediated by private tutoring (H3) but proved to be

Table 8.5 Factor analysis results of goal orientation

Goal orientation factor dimensions	Factor loading	Eigenvalues	% Variance	Reliability
Component 1: competitiveness		5.13	35.09	0.928
I would feel really good if I were the only one who could answer the teacher's questions in class	0.814			
It is important to me that other students in my class think I am good at my class work	0.787			
I'd like to show my teacher that I'm smarter than the other students in my class	0.776			
I do my class work because I'm interested in it	0.740			
One of my goals is to show others that class work is easy for me	0.711			
I would feel successful in class if I did better than most of the other students	0.704			
An important reason why I do my class work is because I enjoy it	0.694			
An important reason why I do my class work is because I like to learn new things	0.662			
It is important to me that I thoroughly understand my class work	0.639			
It is important to me that I look smart compared to others in my class	0.607			
Component 2: success		3.76	31.45	0.909
It is important to me that I improve my skills	0.898			
An important reason why I do my work in class is because I want to get better at it	0.847			
It is important to me that I learn a lot of new concepts	0.806			
One of my goals is to show others that I'm good at my class work	0.800			
One of my goals in class is to learn as much as I can	0.731			
I like class work best when it really makes me think	0.703			

Kasier Meyer Olkin measure of sampling adequacy = 0.938*; Bartlett's test of sphericity* = 2705.796

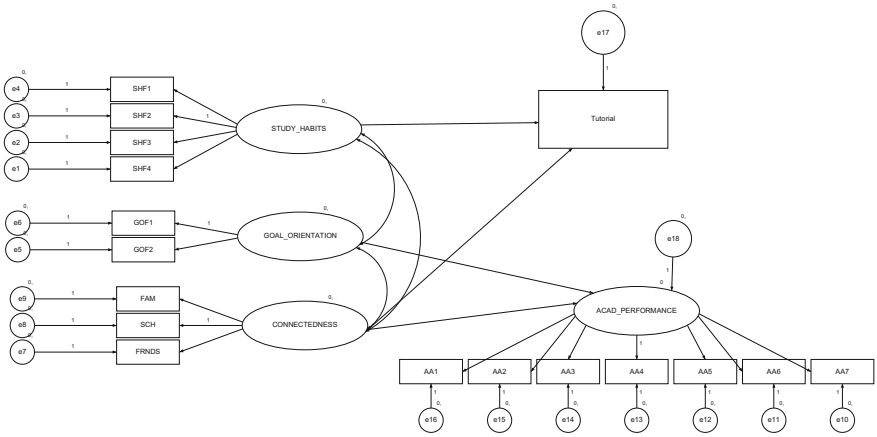

Fig. 8.3 Emerging model

Table 8.6 Model fit statistics of emerging model

Statistics	Model
CMIN/df	2.93
RMSEA	0.08
Parsimony	0.84
Comparative fit index (CFI)	0.91
Normed fit index (NFI)	0.87
Incremental fit index (IFI)	0.91

directly affecting academic performance (0.426). In the same manner, connectedness likewise affected academic performance positively (0.311). Notably, these new causal relationships proved further that students' academic performance did not improve through their availing of tutorial services, as H4 is not supported, but a more connected environment and a more positive goal orientation will lead to improvement in academic performance. Additionally, positive noncausal relationships emerged among the three latent exogenous variables (SH ←→ CON = 0.674, GO ←→ CON = 0.794), with goal orientation and study habits having the strongest relationship (r = 0.905).

Among the dimensions of study habits, SH1 (0.903) proved to be most manifested and SH4 (0.477) the least manifested by the student respondents. Both dimensions of goal orientation showed strong positive manifestations (GO1 = 0.89, GO2 = 0.75). Similarly, all dimensions of connectedness indicated strong positive manifestations, with friends having the strongest connection (0.80). Notably, all indicators of academic performance were positively evident among the students, with AA2 (0.88) as the most evident and AA7 (0.58) as the least evident.

The emerging model proved to have acceptable model fit statistics as shown in the table (Table 8.6).

8.4 Discussion

The study intends to determine the nature of shadow education and its effect on the academic and social profile of basic education students. The study shows that among those who availed tutorial services majority are eldest and come from small families of 1–3 siblings having good economic welfare whose parents are college graduates working in the Philippines. Noticeably, they availed tutorial services during early years in elementary and secondary levels usually to help them do their assignments, reports, and projects in mathematics and only as need arises for a fee of Php 100–Php 200 per hour or Php 1000–Php 2000 per month. Most of them experienced improvement in their academic.

The prevalent study habits among the students in the study concerns goals, organization, assistance, and difficulty, while for the connectedness dimension the dominant factors are family, school, and friends.

The hypothesized model consists of the following four hypotheses involving three latent variables: study habits (H1), goal orientation (H2), and connectedness (H3) as exogenous variables, representing the factors that shape students' decision to avail of tutorial services. Additionally, the latter variable, which serves as the mediating variable is assumed to have a positive effect on the students' academic performance (H4).

H1: The more positive the goal orientation of the student the more he will participate in shadow education.
H2: The better the study habits of the student the lesser is his participation in the shadow education.
H3: The more the student is connected to his family, relatives, and peers the lesser he will participate in the shadow education activities.
H4: The more the student participates in the shadow education the better is his academic performance.

The emerging model in the study shows that among the latent exogenous variables, study habits (H1) proved to have a positive effect while connectedness (H3) proved to have a negative effect on the students' decision to avail of tutorial services. This indicates that the more the students want to improve his study habits and the less he is connected to his family, school, and friends, then the more likely he will avail of tutorial services. Students goal orientation did not prove to be mediated by private tutoring (H3) but proved to be directly affecting academic performance. In the same manner, connectedness likewise affected academic performance positively De Castro, Torres, Alarcon (2015) has similar finding that connectedness has positive effect on achievement; however, continuity and duration have an indirect impact on the academic achievement and goal orientation of the students. Additionally, the continuous participation in private tutoring enhances good study habits, better goal orientation, and higher achievement level. Chad (2012) likewise reported shadow education affects competitiveness and academic achievement.

In summary, the higher the student desire to improve his study habits and the less he is connected to his family and friends the more likely he will participate. However, the more he is connected to his family and friends and the higher his goal orientation the more likely his academic performance will improve. Academic achievement in this study is not supported by participation in shadow education or private tutorial, but a more connected environment and a more positive goal orientation will lead to improvement in academic performance. Additionally, positive noncausal relationships emerged among the three latent exogenous variables.

Among the items in the study habits, dimension "organizing thoughts/ideas from readings proved to be most manifested, while "regular place for studying "is least manifested. Similarly, all components of connectedness dimension indicated strong positive manifestations, with friends having the strongest connection. Notably, all indicators of academic performance were positively evident among the students, with" answering assignment correctly" as the most evident and representing school during competitions "as the least evident.

8.5 Conclusion

The objective of this study is to determine the effect of shadow education on the academic and social profile of basic education students. The study found that the higher the student desire to improve his study habits and the less he is connected to his family and friends the more likely he will participate. However, the more he is connected to his family and friends and the higher his goal orientation the more likely to improve his academic performance. Academic achievement in this study is not supported by participation in shadow education or private tutorial, but a more connected environment and a more positive goal orientation will lead to improvement in academic performance.

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Part II
Culture of Teaching and Learning

Chapter 9
Blended Learning: Uncovering Challenges in Implementing Online Videos in Higher Education

Karim Hajhashemi and Nerina Caltabiano

Abstract Integrating different types of media to deliver subject materials to students is becoming ubiquitous in higher education due to the explosion of Web 2.0 tools and digital technologies that are now available. Among these computer and Internet-based innovations, educational digital video clips have become prominent due to their capabilities for providing stimulus for deeper thought processes, communication and interaction among users. These benefits occur when digital videos are combined with effective pedagogy. Traditional delivery of videos through television and analogue recorders has long been part of higher education, but the rise of cloud-based digital video has made a significant impact on the blended learning landscape. This paper reports on interview data involving lecturer participants at a rural and tropical university in Australia. The results provide evidence of the challenges that they face in implementing online videos in their teaching.

Keywords Blended learning · ICT · Online videos · Web 2.0

9.1 Introduction

With increasingly rapid and continued growth and advancement, Web 2.0 technologies have become one of the most important means in learning environments and higher education institutes in particular. Web 2.0 technologies are gaining intense interest in all educational sectors as they are supporting students' demands and are facilitating the changes of learning through extending learner-centered experiences (Dabbagh & Kitsantas, 2012; Rahimi, van den Berg, & Veen, 2015). For instance, specific features and benefits of Web 2.0 tools, particularly, collab-

K. Hajhashemi (✉) · N. Caltabiano
James Cook University, Cairns, Australia
e-mail: karim.hajhashemi@my.jcu.edu.au

N. Caltabiano
e-mail: nerina.caltabiano@jcu.edu.au

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orative and interactive aspects of knowledge and information acquisition, are fostering teaching and the learning process (Soomro, Zai, & Jafri, 2015). According to some researchers (e.g., Yeen-Ju, Mai, & Selvaretnam, 2015), Web 2.0 technology has opened the doors to a wide repository of information fostering communication and collaboration practices among learners. According to Soomro et al. (2015), teaching-friendly characteristics of Web 2.0 technologies have brought some advantages such as "easy accessibility, usability, and flexibility", supporting various pedagogical and instructional approaches (p. 285). Moreover, Nazatul Aini (2014) addresses more advantages for higher education institutes including "easier and faster access to information, when and where it is needed; sharing accumulated experiences and resources; and compatibility with the elements of the educational field and the existing contextual dynamics" (p. 88).

The emergence of the Web 2.0 social networking technologies has provided new opportunities for education, such as facilitating collaboration, creativity and innovation for students in groups or individually (Lee & Markey, 2014; Moyle, 2010). For instance, Lee and Markey (2014) appoint that Web 2.0 technologies allow students to create and share content with their peers through social networking "in a dynamic and instantaneous manner" that enhances interaction, collaboration and networking among students (p. 284). Web 2.0 technologies have allowed for an expansion of activities and user contributions. Newland and Byles (2014) address the capability of Web 2.0 technologies by providing a different pedagogical approach through collaborative knowledge construction.

As a response to the call for a technology-enhanced approach fostering a more student-centered experience and to actively engage students, many universities are encouraging their educators to rethink and reframe their teaching approaches and delivery method in conjunction with the arrival of Web 2.0 technologies. However, as Moyle (2010) states, the advantages of implementing Web 2.0 networking technologies in the learning environment "depend upon the teaching and learning approaches used, and this shifts the emphasis to the skills and the role of the teacher" (p. 39). As such, some researchers (Harris & Rea, 2009; Karvounidis, Chimos, Bersimis, & Douligeris, 2014) recommend incorporating such technologies so as to not obstruct pedagogy. Also recommended is the use of these technologies in a way to create a balance between the needs and demands of both students and educators (Cole, 2009). Further, the rapidly increasing number and type of Web 2.0 technologies and tools provide a barrier for educators "to keep pace and understand the opportunities for their use in teaching and learning" (Cain & Fox, 2009, p. 1). Consequently, Cole (2009) argues that the outcomes of integrating technology into the classroom should be clear by the higher education institutes. They must not confuse technological interactivity with interactive learning.

There are many different types of online tools that can be categorized as Web 2.0. These include social networks (e.g., Facebook, LinkedIn, MySpace), Wikis (e.g., Wikipedia), blogs (e.g., Wordpress, Academia), microblogs (e.g., Twitter,

Blogger), media sharing (e.g., YouTube, Flickr), and social bookmarking services (CiteULike, Delicious, iKeepBookmarks), and creative works (e.g., podcasts, videocasts). All these share the same core idea of constructing knowledge and enhancing users' interactivity (Bower, 2015; Morgan, 2014b; Rahimi et al., 2015; Soomro et al., 2015). In a like manner, Rahimi et al. (2015) state that Web 2.0 tools provide students "with 'just-in-time' and 'at-your-fingertips' learning opportunities, and can support a wide range of teaching and learning activities" (p. 781). Among the above-mentioned Web 2.0 technologies, videos and media sharing has become more ubiquitous. Although the introduction of this technology started in 1960s with the arrival of analogue videos, it has played an important role in education and has proven its effective role as a learning medium in providing more user access opportunities to a wide audience worldwide and enhancing their understanding (June, Yaacob, & Kheng, 2014; Ritzhaupt, Pastore, & Davis, 2015). In other words, the integration of technology into the classroom and its advances has enhanced the way of creating videos to facilitate and improve learning and teaching. For this reason, technology integration has become a vital part of lecturers' professional learning and teaching toolbox to actively engage and motivate students in various modes of learning. This study focuses on the lecturers' perceptions of the obstacles that they have experienced while utilizing videos in their teaching. For this reason, the following interview question was formulated: *What are the different challenges and obstacles for online videos?*

9.2 Method

9.2.1 Participants

The qualitative study involved 10 lecturers in a rural and tropical university in Australia. All participants were from the discipline of Education and they were aged 35 and over.

9.2.2 Procedure

After obtaining ethical clearance for the study, the willing lecturers were invited to participate in interviews to share their experiences about challenges of online videos through their teaching. The interviews were held at a mutually agreed time and place. All sessions were recorded and transcribed by the first author. The study uses pseudonyms to keep the participants' identity confidential.

9.3 Results and Discussion

The findings of the study revealed distinctive similarities between lecturers' tech-literacy and the extent of video integration and types of videos that they use. The most visible similarity between lecturers was in terms of incorporating different kinds of short YouTube videos. Besides the short YouTube videos and other online resources, all lecturers reported that they could create their own videos by using Camtasia, and not having a reliance on the available online sources. Camtasia is a screen capture tool implemented into the classroom to capture lectures, activities and PowerPoint presentations. It provides lecturers the opportunity to record a video via Webcam while they are orally presenting or reading an article, or a PowerPoint on a computer screen. Thus, the video can capture and record movement on the screen, and both the voice and the lecturers' presentation. While creating Camtasia videos can be time-consuming and costly, the findings revealed that it has been embraced by the academic participants and several researchers (Bull, 2013; Ng'ambi, 2013; Silva, 2012; Thiele, Mai, & Post, 2014) have recommended its use.

As a variant of blended learning and an innovative pedagogical approach, some participants ($n = 5$) have also made their own flipped videos that is a video for students to be watched at home, and it has garnered a lot of attention among academics and the media. As such, they could use Camtasia Studio as a tool for creating flipped videos and content reviews. According to Bull (2013), "Camtasia digital interactive files promote flipping the classroom through use of video files that students watch as homework and apply concepts in the classroom" (p. 614). Thus, videos can support teaching and developing the curriculum in a flipped classroom model (Dong & Goh, 2015).

Considering the aim of the question, the study revealed some challenges that lecturers have found in their teaching. According to the data gathered from interviews, it seems that the challenges are around the use of Camtasia, rigidity (clunky platforms), technology access and funding, technology mastery, upskilling in latest technological change and innovation, the structure and the pedagogy and the types of activities that they implement. Being aware of the university's attention and funding in this current climate taps into what is happening culturally. For instance, Brian asserts that a lecturer just gets used to one operating platform or one software system and then it is updated and outmoded and overloaded by something else. Therefore, he thinks that in a lot of the software and hardware development, there is a lot of planned obsolescence. To Julia, another educator, the challenges are around the structure. It is communicating the structure to the students and being explicit about what the demands are of the student.

In fact, digital technologies can only be effective in combination with sound pedagogical approaches. For instance, some researchers complain that the flipped method has neglected the important aspects of good teaching (Morgan, 2014a). Some other highlighted issues are around creating a big gap between high- and low-income students, Internet access problem especially in the rural areas, limited

budget of educational institutes and the costly required software access, the required training sessions for teachers on how to use the software and to structure a flipped classroom, and the required self-learning reliance and motivation from students in this non-traditional method (Findlay-Thompson & Mombourquette, 2014). As stated by Ash (2012) and Raths (2014), the principle of this method may look simple, but there are a multitude of ways of flipping the classroom based on the subject and educational philosophy differences. Moreover, the classroom environment has become as generational challenge for both students and lecturers based on their various levels of proficiency and reliance on technology. For this reason, Berrett (2012) states, "content is not going to be the thing we do. We're going to help unpack that content" (p. 38).

In addition to the above-mentioned challenges, lecturers need to find out whether students are engaged with the material. Indeed, students must have the motivation to follow the educational material provided through the videos. Obviously students have the reading materials and the lecture notes, but giving them a flipped video, for instance, to watch before coming to class, might give them a sense of what the content of the discussion in the class will be. In short, as Kleber (2015) states, today's students' diverse needs have provided a continuous challenge to modern educators as they need to meet their students' diversity in the fast-paced world of the technology learning environment. Such challenges may seem endless due to the lack of time, money and staff. Blended learning may not be the only solution. However, as Kleber (2015) appoints, blended learning and its variants (e.g., flipped classroom approach) provide "a dynamic, evolving tool that can unite students, teachers and administrators through technology with the goal of increasing learning and engagement" (p. 24). These increases in learning and engagement empower students with measurable growth in the required skills they need to compete in the ongoing challenges in higher education.

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Chapter 10
Conceptualising Humour to Enhance Learning Among Engineering Undergraduates

Siow Chun Lim and Swi Ee Cheah

Abstract One of the challenges faced by engineering educators in the twenty-first century is delivering content heavy and discipline-specific modules to students with ever-shortening attention span. This paper argues that incorporating humour in teaching may be more effective than the traditionally didactic nature of teaching and learning in the engineering discipline. Yet, instructional humour in engineering education is a field that is still relatively unexplored compared to other fields of education. In this study, a review on the theories supporting the foundation of humour will be outlined. Types of humour deemed applicable in the context of delivery for engineering courses are then identified and discussed in relation to issues concerning humour in teaching. This paper will also discuss the preliminary findings from a study conducted to understand engineering lecturers' perceptions towards application of humour in their instructional delivery. It is concluded that a basic humour engagement scale could be adopted to enable lecturers in conducting self-assessments on the incorporation of humour in their instructional delivery.

Keywords Humour · Engineering education · Instructional humour

10.1 Introduction

Engineering is traditionally known as a didactic subject with a strong emphasis on transmitting discipline-specific concepts and principles (Becher, 1994). While engineering may seem a didactic subject, it also requires that students are able to apply the knowledge they learn to solve practical problems and create something

S.C. Lim (✉)
Multimedia University, Cyberjaya, Malaysia
e-mail: chunlim87@gmail.com

S.E. Cheah
Taylor's University, Subang Jaya, Malaysia
e-mail: SwiEe.Cheah@taylors.edu.my

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new (Sharp, 1991). As advocated by the Engineering Accreditation Council and the Board of Engineers Malaysia, the engineering curriculum must be tailored towards the concept of outcome-based education. An accredited engineering curriculum in Malaysia typically comprises of 12 programme outcomes, which the graduates should attain upon graduation. Unsurprisingly, the problem-solving component is captured in at least one of the 12 programme outcomes. Hence, the challenge lies in how problem-solving skill can be taught holistically to students. Problem solving requires students to master the ability to evaluate and create solution, which occupy the two highest cognitive levels in Bloom's Taxonomy. Moreover, problem-solving skill is more than the mastery of cognitive skill at the individual level. The process of problem solving often requires collaborative and social skills and as emphasised in the work of practising engineers, teamwork and communication are crucial. Problem solving in engineering education should ideally cover the aspects of (i) cognition where the abilities to evaluate and create are valued, and (ii) social and emotion where the process involves collaboration, teamwork and communication. Humour used or teaching or instructional humour is therefore considered to be essential in promoting problem-solving skill as well as elevating the efficiency of delivery of engineering knowledge.

Humour is generally associated with being sociable. It is not wrong to assume that with humour in instructions, there will be increased teamwork and communication that facilitate problem solving. Research done on schools, colleges and university also concur that appropriate use of instructional humour tends to result in enhancement of students' creativity (Boyle & Stack, 2014; Katrina & Paivi, 2011). However, there has not been a systematic study done on how instructional humour can be used to enhance the teaching and learning process for engineering programmes at the university level. The study is motivated to explore instructional humour for engineering education by conceptualising humour through an extensive literature towards a perception study among the academics involved in teaching engineering undergraduates.

10.1.1 Statement of Problem

Research on humour covers a multidisciplinary field such as psychology, philosophy and linguistics, sociology and literature. Studies that attempt to relate humour to learning have found that humour increases motivation and learning in general (Banas, Rodriguez, & Liu, 2011) as well as controls problematic behaviour and facilitates foreign language acquisition (Cornet, 1986). Some researchers argued that there is an increasing need for delivery of engineering courses to be done in pedagogy which involves humour and empathy to promote engagement with students (Katrina & Paivi, 2011).

As can be seen, there is a dearth of research on how humour works in facilitating learning in the field of engineering, particularly on what may qualify as instructional humour while others are not. Hence, the motivation of this study is to attempt to classify the types of instructional humour deemed applicable in engineering courses and to gauge the perception of engineering lecturers in Malaysia towards instructional humour.

10.2 Theoretical Perspectives

Three seminal theories have traditionally been used to explain what contributes as key elements of humour: superiority, relief and incongruity theories. These theories are discussed to provide a fundamental understanding on humour in its different forms.

Superiority theory views humour as an element that results in having a winner and a loser (Gruner, 1997). The person that manages to make fun of the other successfully is deemed the winner. A sense of superiority emerges from playful competitions and/or disparagement of others thus resulting in laughter or a funny situation. In the context of teacher–student relationship and where the primary focus of teaching is now aimed to be student-oriented, this theory may be inappropriate.

Relief theory defines humour as a pleasant feeling or sensation that replaces a person's negative feelings such as sadness, fear and tension. Freud explains that humorous laughter could result in a sudden release of tension due to entertainment of taboo or nonsensical thoughts (Rutter, 1997). Minsky (1981) builds upon Freudian theory in suggesting that jokes can also be understood as puns, words that connote double meanings and challenges one to make a "sense-shift" (Mulder & Nijholt, 2002) of the words between the conventional and less-obvious meanings.

Incongruity theory, popularised by Kant, expands on relief theory to conceptualise humour elicits laughter as the sudden incongruity between object perceived and the reality such as telling of jokes (Kant, 1911). In other words, humour must contain elements of surprise or contradiction. According to Mulder and Nijholt (2002), the incongruity-resolution theory further sheds light on how jokes are structured linguistically and that they are not under influence of the surrounding factors. It is, thus, hard to explain why the same jokes can keep eliciting laughter while others may not be found funny at all.

In order to apply these theories in the attempts to understand and explain humour in teaching, it is crucial to make a distinction between comedic humour for entertainment and purposeful humour for learning. Humour used in teaching should be planned carefully to ensure its alignment with instructional objectives, otherwise it will be "reduced to a means of amusement for students with no learning outcomes" (Mafakheri & Nasiri, 2015). This supports Jones (2015, p.19) who argues that purposeful humour is a form playful learning or "edutainment" as opposed to teachers being comedians who provide entertainment. Playful learning engages learners actively in thinking and questioning, while comedic entertainment involves students being passively entertained to produce laughter (Jones, 2015). One of the

biggest challenges in using humour is in ensuring that humour is used purposefully to enhance or engage learning, lest it becomes meaningless comedic entertainment (Baid & Lambert, 2010).

10.3 Types of Humour

There is an array of forms or types of humour available from extant literature. Wanzer, Booth-Butterfield, and Booth-Butterfield (2005), for example, suggests nine types of humour namely low humour, nonverbal humour, impersonation of specific characters, language/wordplay, using humour to reduce negative affect, expressiveness/general humour, laughing, using funny props and seeking others who are known to be funny. A year later, Wanzer further simplified into four types namely humour related to class material, humour unrelated to class material, self-disparaging humour and unplanned humour (Wanzer, Frymer, Wojtaszczyk, & Smith, 2006). Martin (2007), on the hand, summarises humour in terms of jokes, spontaneous conversational humour (intentional) and unintentional humour. Drawing from the literature and then contextualising them into its appropriateness of application in teaching of engineering courses, five types of humour have been identified as jokes, anecdote, props, self-deprecation and spontaneity. The following section discusses each type of the identified humour followed by some items that can be used for self-assessment by the engineering lecturer.

10.3.1 Jokes

Jokes can be referred as consisting of puns or words with double meanings, wordplay and punchlines among others (Minsky, 1981). Puns exploit multiple meaning of words or similar-sounding words for an intended humorous or rhetorical effect, while wordplay is a technique of using words in an innovative way to reinforce a certain meaning behind a message. The reinforcement happens due to amusement created among the intended audience. Jokes can also include humorous, amusing or informative "pulses" which end in punchlines (Hetzron, 1991). Punchlines, as understood from Raskin's Theory of Verbal Humor (Atardo & Raskin, 1991), are different from the usually unambiguous jokes. Punchlines introduce ambiguity in jokes by triggering a switch that makes the hearer realise that more interpretations of the jokes are possible from the beginning (Mulder & Nijholt, 2002).

In the engineering context, this humour type is applicable as certain engineering theories or concepts may be long-winded and difficult for students to grasp. Clever use of wordplay and conversion of the key points to punchlines may be able to assist students to better understand the concept.

Below is a list of suggested items that can be used for self-assessment on the use of jokes:

(a) I am a good speaker
(b) I am good with wordplay
(c) I use puns when interacting with people
(d) People usually laugh at my puns
(e) I use puns in my class
(f) I find my students to be receptive to my puns
(g) I find that my students are able to grasp a concept taught using puns better.

10.3.2 Short Story/Anecdote

In the context of humour, telling short story or conveying anecdote is a context-driven method in which the speaker leverages on his or her life experience and relates it to the lecture or course material to be delivered. Unlike spontaneity, this method requires careful planning before its execution in the class. For instance, the lecturer may explain how he or she has applied a certain engineering principle to solve the day-to-day problems that he or she is facing.

A list of suggested items that can be used for self-assessment on the use of short story and anecdote is as follows:

(a) I am a good speaker
(b) I am good in telling anecdote
(c) I tell short stories when interacting with people
(d) People usually are amused with my story
(e) I tell anecdote related to the topic in my class
(f) I find my students to be receptive to my anecdotes
(g) I find that my students are able to grasp a concept taught using anecdotes better.

10.3.3 Props

Props is another type of humour which is heavily context-dependent. Lecturers may use funny props such as cartoons to pictorialise an otherwise dry course material. This method is effective especially in capturing the attention of the students and is particularly useful for visual learners. Two suggested items that can be used for self-assessment on the use of props are as follows:

(a) I use props to explain certain concepts in my class
(b) I find it easy to find suitable props to be used in my class

10.3.4 Self-Disparaging/Self-Deprecation

Self-disparagement can be understood as a technique of reprimanding oneself either by intentionally belittling oneself or by being excessively modest. In the context of this discussion, it could mean that the lecturer intentionally commits mistakes, which could be in the form of miswritten equations, tongue-slips or purposely solving a question in the wrongful manner to elicit attention of students. Studies on psychology, however, many have a different perspective towards self-disparagement as a sense of humour. For example, Murphy et al. (2002) found that self-disparagement is related to feelings caused by personal inadequacy and could indicate an onset of depression (Murphy et al., 2002). Others have found that disparagement, whether on others or self, is considered as offensive and not related to learning (Wanzer & Frymer, 1999; Wanzer et al., 2006).

Two suggested items that can be used for self-assessment on the use of props are as follows:

(a) I belittle myself to humour people around me
(b) I intentionally make mistakes in my lecture to emphasise a point to my students.

10.3.5 Spontaneity

This technique is unintended and highly random in nature whereby the lecturers react towards stimulus which can be in any form in a humorous way. For instance, when a student asks a question, the lecturer can answer it in a humorous way which will prompt the student to think further.

A list of suggested items that can be used for self-assessment on being spontaneous is as follows:

(a) Being humorous is a natural communication orientation for me
(b) I can be amusing or humorous without having to tell a joke
(c) I can easily relate funny or humorous ideas to the class
(d) I relate amusing stories, jokes and funny things very well to others
(e) I use humour to communicate in a variety of situations.

10.4 Preliminary Perception Study

A preliminary study was carried out to further explore humour from the academics' perspectives. This was a small-scale preliminary study to establish the relevance of humour in context. An online survey was conducted to gauge the perception of

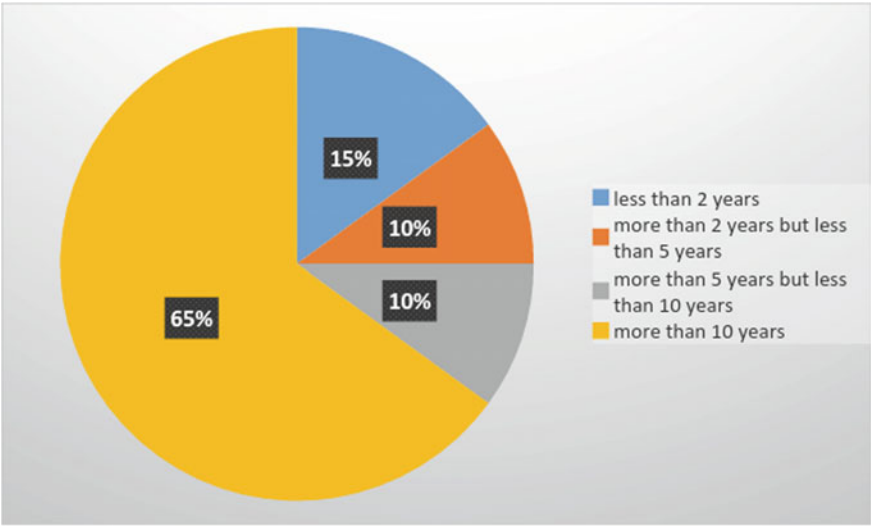

Fig. 10.1 Classification by teaching experience

engineering academics on their self-perceived utilisation of humour in their pedagogical approach. Twenty respondents who were academics in the Engineering Faculty consented to participate in the preliminary study. Figure 10.1 presents the proportion of the years of teaching experiences among these respondents.

Out of the 20 respondents, more than half have more than 10 years of teaching experience as shown in Fig. 10.1. All except for the two respondents with more than 10 years of teaching experience thought that they were naturally humorous. This resulted in 60% of the total having perceived themselves as being humorous in their teaching. However, it is also interesting to note that all the respondents thought that humour helps to enhance the teaching and learning process in class except for one who responded otherwise. The results showed that the huge majority, including those who perceived themselves as not naturally humorous, agreed that pedagogical approach with the infusion of humour would be beneficial and hence humour is relevant to their context of teaching and learning.

A total of 65% of the respondents found implementing humour in their teaching tasks to be challenging. More than half of the most senior lecturers in terms of teaching experience came to the agreement that delivering their lessons by interjecting humour is an arduous task. This seems to suggest that even engineering lecturers with many years of teaching under their belts find such a task to be daunting. Only 30% of the surveyed lecturers thought that sense of humour is a natural talent and can never be nurtured.

Table 10.1 summarises the percentage of respondents who applied the aforementioned types of humour as well as their perceptions on how receptive their students are towards implementation of such type of humour. It can be clearly seen that the result concurs with the observation that 95% of the respondents thought that

Table 10.1 Types of humour, frequency of use and mean receptive score

Type of humour	Regularly used (%)	Sometimes used (%)	Never used (%)	Mean receptive score (out of 5)
Jokes (puns/wordplay/punchline)	20	70	10	3.7
Short story/anecdote	15	85	0	3.9
Props	20	70	10	4.0

humour and pedagogy is a good mix that would result in an improvement of teaching and learning. Almost all of them have used humour in their lesson delivery, but the majority of them are of the opinion that it should be practised only when appropriate. The mean scores of how well received are their sense of humour among students also tell that the lecturers are generally high in confidence with their ability to engage with the students.

The remaining survey results are as follows:

1. 70% of the respondents have intentionally committed mistakes during the oral delivery of an engineering course to emphasise a point to the students
2. 55% of the respondents perceive that they can spontaneously create humorous ideas to deliver a lecture to the class
3. 85% of the respondents answer their students' questions in a humorous manner.

10.5 Conclusion

This paper sets out to conceptualise humour and contextualise it for application in engineering pedagogy. A brief review on humour theories was presented followed by identification of humour with suggested items to measure each of it. The suggested items were then compiled into a humour engagement scale for self-assessment purpose to enable engineering lecturers to gauge their own ability in implementing humour in their teaching and learning routines. This preliminary study on the perception of engineering lecturers on interjection of humour into their instructional activities seemed to conclude with positive results suggesting that humour is relevant in engineering education. It is therefore recommended that future studies should involve a bigger size of participant. Future studies could also focus on comparing students' perceptions with lecturers' self-assessment to further understand if humour used serves the purpose of enhancing teaching and learning process.

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Chapter 11
Scaffolding Social Support Amongst the Fresher Students Through Mapping Activities

Arniza Ghazali

Abstract Mapping activities (coded as PIT2 and PIT3) as means of transferring learning autonomy to students were implemented and evaluated to understand the way learning of the fresher students in the second semester of their first year in the Bachelor of Technology in BPC (Bioresource, Paper and Coatings) programme was affected. The observed initial tendency of clicking only with classmates of the same ethinicity was severe and the group of learners is thus, hereby addressed as 'stiff community'. To rectify the situation, the performed PIT3 mapping activities allocating an equal opportunity for students to participate by filling up numbered blank ovals, witnessed intensive interaction across the ethnic groups. Instructor's deliberation suggests the effectiveness of PIT3 as an indirect instruction to rapport and improvement in the social support. The findings, which are in 100% agreement with students' self report (SSR), moreover demonstrate the function of mapping activities in reinforcing students' cognitive engagement through selection of keywords representing the principal idea that learners use in their own exploration of the learning materials. Besides acting as points triggering curiosity, keywords allow transfer of greater learning autonomy to students. The un-stiffening phenomenon from PIT3, which better prepared students for PIT2—verbal description of co-constructed map, in turn, supports learning via good relationship, teamwork and sustainability of performance throughout the academic year. Moving from the desirable scaffold social impact, the applied modes of mapping activity are potentially the seed initiative to inculcate the attributes for global citizenship in any other learning setting.

Keywords Social · Cognitive-engagement · Thinking-classroom · Mapping

A. Ghazali (✉)
Universiti Sains Malaysia, George Town, Penang, Malaysia
e-mail: arniza@usm.my

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11.1 Introduction

"Everyone has a story, everyone has a struggle and need help along the way", Arredando (2013), Founder, Los Angeles Unified School District.

Behind Arredando's fondest empathy for diverse learners and their unique learning experiences, she drew the needs for learners to have a coach or a teacher to support learning in challenging times. The human factor underlying diversity, according to observant experts, is humans' creativity and it is creativity that amplifies the capacity of coping by cherishing the rich possibilities of choices in thriving difficult situations. Because of learners' package of diversity and creativity, a teaching system requires proper design to serve beyond just a knowledge delivery system but to creatively awaken the push element in any learning—curiosity (Robinson, 2013). Gruber, Gelman, and Raganath (2014), in this regard, recorded an in situ effect of curiosity in preparing the brain for learning, justifying all together, the must-have element in vibrant teaching and learning.

To add longevity to students' love for learning, relationship amongst learners is as equally significant as the relationship learners forge with teachers, the coach. Without readiness to communicate, the climate of learning would be stiff and for fresher students, adaptation to the new learning setting and with pupils from diverse backgrounds needs to happen fast. If stiffness prolongs, the climate of learning may eventually be hampered, resulting in an onset of withdrawal from the study programme.

Although bizarre, the incident was apparent with the 2015/2016 fresher students of Bachelor of Technology (BPC) programme, last semester. The class of 19 pupils, hereby addressed as 'stiff community' consists of learners from two ethnic groups, X and Y. The minimum interaction and tendency of clicking with only the next few neighbouring friends of the same ethnicity was the factor featuring the group as 'stiff'. Even communication level 1, commonly described as surface 'social talk' (Fig. 11.1) was absent. Consequently, the class was divided into two regions of X's and Y's. Amongst the stiff community are reserved students who seemed aimlessly present in the classroom.

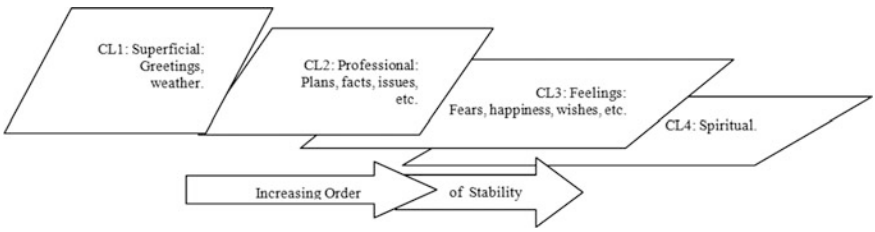

Fig. 11.1 Communication levels (*CL*), translated from literature

For an instructor who grew in a huge family with cross-ethnic marriages, the observed strain was the first challenge to overcome in order to transform the stiffness into vibrant learning climate. Classroom rapport was thus planned through mapping activities for 2-in-1 job of engendering powerful learning as previously demonstrated (Ghazali, 2016) and indirectly instruct intense communication (level-2, at the minimum, Fig. 11.1) amongst students. Hypothetically for the fresher students in focus, with advancement of communication level, learners would become more comfortable, happy to attend class, able to get along with peers and more functional in teamwork.

In fact, happiness as the motivating factor to pursue learning has long been demonstrated essential (Achor, 2011; Talebzadeh & Samkan, 2011). An intervention was therefore designed and evaluated by seeking understanding into two foci inquiry stated in the subsequent section.

11.1.1 Research Questions

How would (the designed PIT2 and PIT3, in specific) mapping activities, which has a long-standing regard for its powerful cognitive engagement, overcome the stiff community phenomenon without diluting learning? In what ways can this powerful tool be designed for achieving the 2-in-1 meaningful learning and the desired social support and impact in a tight 7-week schedule?

11.1.2 Objectives

The main objective of this study is to look at how mapping transforms the stiff community into a vibrant team of learners without sacrificing learning. As maps only place principal ideas in the transcription (PIT), each idea represented by minimum keywords provides support for students' literacy process. With this accepted feature, this study also aims to estimate the degree of support PIT offers in the transfer of learning autonomy and leverage the different learning needs analogous to personalised learning approach.

11.2 Methodology

11.2.1 PIT in Thinking Classroom

To a batch of 19 students registered to study the core subject, IWK103, "Thinking Classroom", featured by 3:2 lecture-to-PIT activity time allocation, was designed

with PIT3 (mapping activities that requires students to fill up empty pits or oval blanks on the maps drawn by the instructor) as the transformational instruction. Having involved in several PIT3 weekly activities, PIT2 was introduced. In PIT2, students were coached in the way to construct topical maps based upon identification of principal ideas and radially arranging them with the breeding or supporting ideas. Subsequently, students were to verbally present the co-constructed map before the class. The numbers coded to PIT (PIT1, PIT2, PIT3, etc.) were based upon the chronology of the various designs of mapping activities developed for the Thinking Classroom since 2014. The birth of PIT2 and PIT3 was based on the needs to design mapping activities that are relatively more manageable in comparison to course map construction (PIT1), which was unanimously regarded as tough and time consuming. As thinking was entirely driven by keywords that serve as 'Principal Ideas for Thoughts', mapping activities in Thinking Classroom are abbreviated PIT, which may alternately be referred to as 'Principal Ideas in Transcription'. Regardless of form, PITs were previously witnessed as giving more senior learners greater learning autonomy (Ghazali, 2017). The choice of PIT, however, would depend upon the students' learning needs diagnosed by the instructor. To improve interaction amongst learners of focus in this study, PIT3 and PIT2 were chosen.

Two of the most reserved participants from each of the ethnic group were appointed leaders and liaison for the class. These were students who were at higher risk of disengagement and seemed to need extra dose of attention to support their learning throughout the semester. Their notes are checked for accuracy by the instructor and they were then made as referral points for the class for PIT activities. For PIT2, the two participants merge as a team to present the course map constructed by the instructor, before the class.

11.2.2 Qualitative Contents Analysis

Students' self reports (SSR) were gathered from their voluntary responses in social media as well as questionnaires consisting of six parts. The first part, Part A, assesses if the gist of the course materials are comprehended. Part B surveys for mapping experience, Part C examines if mapping has transferred learning autonomy to students by supporting literacy process, Part D inquires for affective engagement to ensure the applied intervention positively affects learners in affective ways, Part E scans if new approaches have been adopted by students to study the course in focus while Part F is on students' state-of-being or lifestyle, to check if students had adopted healthy lifestyle, such balanced diet, fitness, whether or not they are affected by negative circumstances and the likes. This study analyses participants' responses for Part A, B and C while the rest are to help understand their situation. Part A was used as teacher rating of students (TRS) in accordance to the guideline by Fredericks and McColskey (2012), to assess the degree of achievement of the set CLO for IWK103 Part 1.

The instruments were administered at the end of the course. Unexpected self report from students who contacted the instructor after obtaining their semester examination results is also reported. It is important to note the interchangeable use of the term 'teacher', 'coach' and 'instructor' to mean the lecturer coordinating the course in focus.

11.3 Results and Discussion

11.3.1 Pits of Curiosity

To understand the ways mapping activities in PIT3 forge social support, Part A, Part B and Part C of the SSR were studied. Analysis of SSR apparently shows that 84% of students agreed that the keywords on the map and the drawn connections were the trigger of curiosity, which then promoted cognitive engagement through repeated attempts of guessing and then seriously checking if the guess makes sense in further linking to the next keyword (Fig. 11.2). In neuroscience, curiosity was observed live via fMRI as promoting readiness for learning process by activation of the learning regions of the brains (Gruber et al., 2014).

11.3.2 Pits of Social Support

As each correct idea was awarded the deserving marks for group (total correct answers) and individual marks (marks for each correct contribution), it was important for keywords to be accurate. Students' determination to collect as many marks as possible indirectly instructed them to discuss to avoid presenting wrong answers and to fish for better response and to seek for approval from the group.

Analysis of SSR revealed three principal claims for the forms of social support developed from PIT activities in the designed Thinking Classroom (Fig. 11.3).

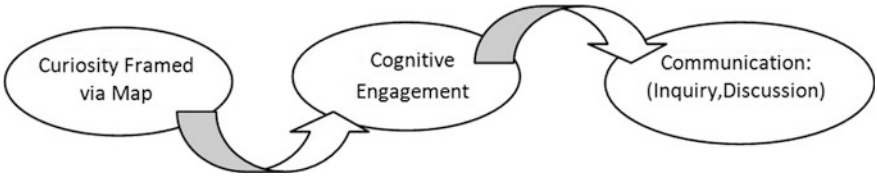

Fig. 11.2 The expected learning and socio-well-being as repercussion of curiosity stimulated by map in PIT sessions

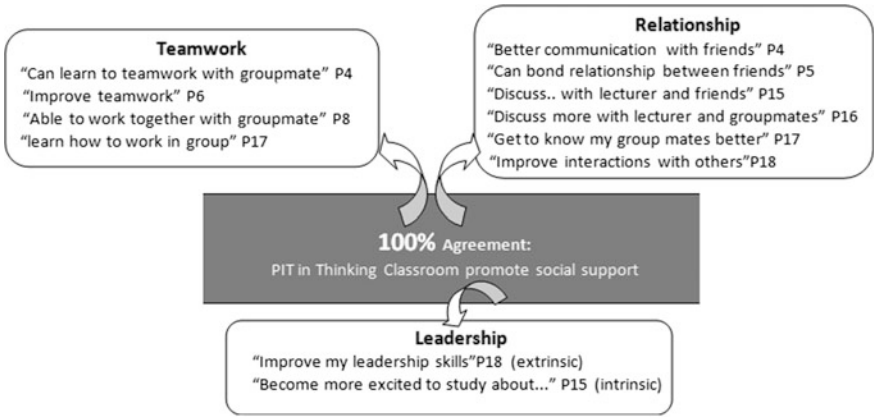

Fig. 11.3 Forms of social support developed from PIT activities in Thinking Classroom

While most students claimed the positive effects of PIT on relationship with classmates, a percentage who penned down similar remarks also claimed that they have learnt teamwork. The most reserved who was appointed leader found himself improved in the aspect of leadership, which to the instructor, is beyond the scope of the course expectation. However, the improved wants for learning shared by P15 was the principal aim of PIT as this shows a form of provocation of curiosity that pushes determination for learning and undertaking the learning process with excitement (affective learning domain). This also implies the development of an intrinsic leadership for learning that is likely to mould learning desires in other courses to come.

11.3.3 Mechanisms of Social Support

With keywords as guide for exploring the borderless information, students were able to take charge of their own learning within the scope defined by the coach. The keywords that aided students' literacy process as agreed by 73% of students, allowed for greater learning and better comprehension of the course materials. This, in turn, allowed for better function as team member in the subsequent small group assignment, PIT2, involving presentation of topical maps that students co-construct with the instructor and elaborated by the understanding they developed from their independent literacy process. As an outcome to the literacy effort, in the preparation for presentation type of mapping activity coded as PIT2, students become the positively contributing team member. This enhances peer acceptance and in return, invites more support from the learning community (Fig. 11.4).

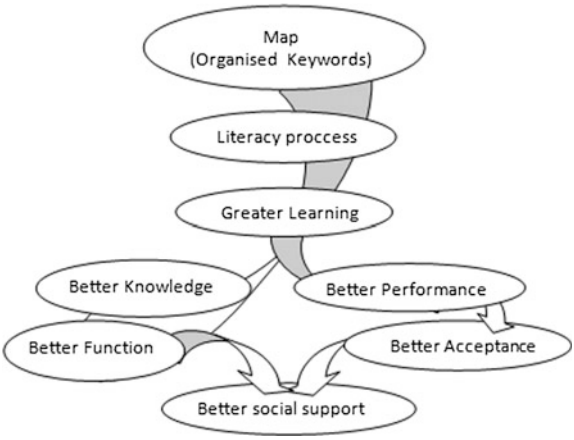

Fig. 11.4 Flow of learning and social acceptance

11.3.4 Serious Learning for Mutual Benefit—Predictor for Sense of Responsibility

Besides P17 who stated clearly that a great deal of effort was invested in the knowledge acquisition process, reflected in the her self-report that she "Put lots of responsibility to make sure classmates understand", TRS shows that a majority of participants performed high quality literacy process beyond the instructor's expectation. During the course of their preparation, students embraced a great sense of sharing, which was described by Bryson and Hand (2007) as the trait of good teachers. The act of managing learning responsibly 'to make sure others understand' was the sign for caring competence (Davies, 2012) that pushes for great learning autonomy and cognitive engagement with serious effort focusing on understanding. The responsible action is also the reciprocal act of recognition to others who were once regarded as strangers. Being predictor for respect for diversity and differences, the reciprocity act of recognition is also the predictor for sense of community (Bryson & Hand, 2007) that supports the longevity and love for learning.

The vibrant spirit of learning depicted on the high correlation between TRS and SSR was a pleasant discovery. The learners were special in many unbelievable ways, one of which being, in conquering their selves and putting aside wishes for the more relaxing 'spoon-feeding' (wished by 74%) and the classical 'drill' learning approach that was posited by Cromley (2000) as leading to memorisation (confession by 63%) they used to embrace. Despite complains about exhaustion from intensive brain works as typically documented with other cohorts (Ghazali, 2015), previous record shows that student revisited the topics as focus of assignment in the subsequent semester. These are signs of the course materials being highly usable, commensurate with the previous report claiming that mapping process enhances the usability of knowledge (Davies, 2010) due to the logical links that are more

preferred by the brains. It is also noteworthy that the links presented on each map not only helps students appreciate the relevance of the knowledge to other courses but also its relevance to the real world.

11.3.5 Rowing, Swimming and Diving to the Finishing Line

The sticky learning process via PIT intervention is an effective mechanism that triggers the brain to work and understand concept and this was reflected by the 100% score for correct students' responses in Part A that checked for the degree of CLO achievement. This is confessed by P7 who asserted in writing that his brain 'melt' and that, "Left brain and right brain had been fully used".

If grit, defined as passion and sticking with future (Ducksworth, 2013), could be taught, PIT series of mapping has witnessed P2 as a model of success in developing grit in students. P2 did unbelievably well despite having undergone extreme personal circumstances, pain, being deprived of good sleep and good food, in addition to loss of loved one. The good in her was contagious enough to impact P6, one of the leaders of the small group assignment, who summoned effort to acknowledge the instructor personally for guiding her through the learning journey "from zero to mastery of the subject".

11.3.6 Beyond the Finishing Line

Having mentioned literacy, sense of responsibility, communication and autonomy as impacts of PIT2 and PIT3, analysis suggests that the adopted learning instructions could act as seed initiatives to support the development of attributes for global citizenship described in the works of Thanosawan and Laws (2014) as well as UNESCO (2015). While the oral presentation in PIT2 trained students to communicate their logical understanding with the topical map as guide, PIT3 seeded the experience by scores as bait, which drove learners' determination to speak out and seek answers that can make their contribution significant to the group scores. By performing the literacy process for personal and group understanding of the topic under their charge, students experienced ethical and responsible acts and the undertaken literacy process also fulfils a useful fraction of the personal and intellectual autonomy, apart from literacy in the attributes of global citizenship.

11.4 Conclusion

The varying modes of mapping activity hereby coded as PIT2 and PIT3 are ways to make learning resonate with the minds of diverse learners to help them interact and support each other's learning as the result of curiosity and determination to positively contribute to the mutual good of each other. As learners proceeded through the semester of Thinking Classroom, the once stiff community showed its true vibrant colours that were indeed there all the time, but dormant. Through PIT2 and PIT3, outstanding learners were witnessed as acting responsibly towards their individual learning for the sake of the bigger team. Beginning with curiosity and further enhanced by the developed significant relationship, the designed mapping activities had effectively scaffold social support for sustained learning process with seed traits of global citizenship initiated along the process.

Appendix

See Table 11.1.

Table 11.1 Measured outcome and students' vote

Outcome	Students' votes and marks on unique experience	
1. Attainment of CLO	100%	Teacher Rating of Students (TRS), based on their understanding of course contents (Part A)
2. Keywords (map) facilitate learning by facilitating literacy process and thus, transfer of learning autonomy	73%	"Did a lot of internet search. no more spoon-feed" P16 "Search detail(s) about the keywords" P2 "I learn to be a research on my topic strongly" P9 "Use a lot of personal research on internet" P17 "Put lots of responsibility to make sure classmates understand" P17
3. Map facilitates learning	83%	
4. Map provokes mind/curiosity	84%	
5. Wholesome/balance (extra remarks from student)	–	"Left brain and right brain had been fully used" P7
The instructor/Thinking classroom design		
6. Students' happiness 7. Elements: gentleness, support, sharp definition of scope, coaching	100% 100%	

(continued)

Table 11.1 (continued)

Outcome	Students' votes and marks on unique experience	
Students' wishes		
8. Favours memorisation	63%	3 Confessed love for memorising; 1 indicates remembering understood points.
9. Wish for being spoonfed	74%	
Voluntary response via social media		
10. Mastery		"Thank you for teaching me from zero to mastery" P6. Translated from Bahasa Melayu to English.

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Chapter 12
The Effects of School Culture Impacting on the Process of Change

Latha Ravindran

Abstract This paper is an account of the effects of school culture on the process of change. Each school has an individualistic school culture, and attitudes are shaped by the social context. This paper using a qualitative approach addresses the question of how the governance of the school and the school's learning environment and cultural context shaped the ESL policy implementation impacting the change process. The extent of the involvement the principals and teachers played in the administration of the school had a profound impact in the implementation of the ESL policy. The paper underscores the importance of understanding the school culture and change processes which are important to bring about effective changes.

Keywords School culture · Change process · ESL policy implementation

12.1 Introduction

Irrespective of their individual objectives for curriculum policy, all countries need to ensure that children in primary schools must meet sufficient levels of achievement to promote their prospects for development and poverty alleviation. The specific policy change is related to the adoption of the activity-based learning (ABL) curriculum which replaced the earlier use of textbook in the place of Teaching Learning Materials (TLM) in an integrated class system. The new approach focused on communicative aspect as opposed to the earlier grammar translation method. The rationale of such an approach was to give equal educational opportunities to students from rural schools and also to cater to the growing demands of English as it gained importance in all sectors. Historical, racial, political, religious, geographical, economic, and various other factors constantly influence the growth of a nation. Hargreaves (1997) asserts that the emotional climate of a building is directly tied to the school's culture. In adapting the curriculum to suit the particular context in which teaching takes place, the teacher is

L. Ravindran (✉)
Taylor's University, Subang Jaya, Malaysia

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confronted with several issues. The intended audience, the way students learn, the school as a context, the best ways to teach, and the extent to which the curriculum should be adapted require the teacher to make decisions which have implications for practice. The context of curriculum implementation is vital as it will illuminate the educational problems it was attempting to respond to.

12.1.1 Education Policies and the Curriculum in India

India is a union comprised of twenty-seven states and nine territories. Achieving Universal Elementary Education (UEE) has proved an elusive goal for India. The deliberations and recommendations of the several committees have formed the basis for the 1968 National Policy on Education (NPE) and the National Policy on Education Resolution of 1986. The National Curriculum Framework envisages the study of three languages at the upper primary and secondary stages: first, the mother tongue/regional language; second, Hindi or English (in the case of non-Hindi-speaking states); and third, one of the modern Indian languages (English in Hindi-speaking states; Hindi or English in non-Hindi-speaking states). There is no explicit statement in the Indian constitution regarding the languages to be taught. This is viewed as omission by the constitution to avoid linguistic complexity faced by the nation (Mallikarjun, 2002). Nevertheless, the constitution recognizes Hindi as the official English of India and English as the associate official language.

12.1.2 Rationale of the Study

The realization of policy in practice actually depends on the fit between capabilities that support the implementation and aims. Different schools and teachers did different things with the same resources, which resulted in different effects on learning. Hargreaves (1997) postulates successful school cultures with characteristics such as openness, informality, care, attentiveness, lateral working relationships, reciprocal collaboration, candid and vibrant dialogue, and a willingness to face uncertainty together. The purpose of this study is to question how the governance of the school and the school's learning environment and cultural context shaped the ESL policy implementation impacting the change process.

12.2 Literature Review

The review examines the governance of school, the school's learning environment, and the school's cultural context that shaped the ESL policy implementation and how it impacted the change process. As Holiday (1994) puts it: 'English language

education [in school] is supported by decisions already taking place elsewhere, which place the classroom as a culture, within a wider complex of cultures between which there are many complex channels of influence' (p. 15). The theoretical underpinning for the present study can be found in Fullan's theory of educational change (2001) in which he expounds the meaning of educational change. The belief that underpins this approach is that change is complex and there are various factors to be taken into consideration in order to effect successful change.

12.2.1 School as Context of Change

The school as a context of change process is very crucial in affecting the teachers' ability and inclination to change. Fullan (2001) cites the organization of the school with the self-contained classroom with no room for teacher interaction as one reason for the teachers to succumb to the daily routine. The teaching culture that exists in the school promotes this self-isolation of the teachers with no opportunity for interaction. Sarason (1990) held a similar view when he commented on the isolation of the school organization which has a negative impact on schools. The culture of the school which has cultivated a feeling of isolation among teachers has impacted them in a negative way. Teachers feel isolated and responsible for their own actions, and they approach a change program with this view of change as an individual activity. As Sarason noted, the context within which the curriculum reform takes place need to be changed.

In identifying the key problem of implementing a new curriculum, Sarason pointed out that individuals view schools and environments as all the same. Sarason (1990) wrote: '… for our schools to do better than they do we have to give up the belief that it is possible to create the conditions for productive learning when those conditions do not exist for educational personnel' (p. 145).

Schools must provide the conducive environment to encourage teachers' quest for improvement and change. Teachers on the other hand must be sensitive to the context of teaching. Capability to adapt to innovations varies from one school to another, and this sensitivity to context is vital when teachers attempt to improve teaching. Realism and practicality of innovation should be taken into consideration in the pursuit of classroom excellence. Prescribed curriculum encourages teacher dependency. As Rosenholtz (1989) observes, in effective schools, collaboration is linked with norms and opportunities for improvement and career-long learning. Educational research attests to the fact that teachers become better teachers in some schools while in some other schools teachers fail to grow. The schools must encourage teachers to collaborate and seek ideas from colleagues which in turn will increase their confidence and commitment to improvement. Collaborative cultures in schools will facilitate commitment to change and improvement.

12.2.2 Social Context of Language Teaching

Language teaching needs to be seen including knowledge about culture as well as language. Good language teaching then relates to being able to achieve language-teaching goals in a particular program, with a particular group of students, and in a particular social and cultural context. There is room for a certain amount of flexibility rather than imposing a model of professional practice because there is a range of variation in what constitutes a good practice as far as language teaching is concerned. Hence Shulman (1987) argues that assigning a uniform standard for determining teacher quality ignores the highly contextual nature of teaching since a language teachers' knowledge base is more than a set of basic skills.

12.3 Methodology

The aim of this study is to examine how the governance of the school and the context and culture shaped the implementation of the ESL policy. The proposed study is a qualitative study. Fifteen teachers and three principals were selected from three schools in Madurai district, India, and face-to-face interviews were conducted to glean their responses. Classroom observations were done to understand teacher's motives which provided as a stimulus for further interviews. The research question that guides this study was as follows: How did the school's cultural context as well as the learning environment impacted the implementation of ESL Policy?

Analysis of data was through constant comparative method and development of themes.

12.4 Findings

The following themes emerged after the data from several sources were analyzed and triangulated.

12.4.1 Social Conditions Impacting ESL Classroom Practice

The classroom environment is not conducive for the teachers to carry out their lessons. Teachers are not trained to teach multi-grade classes. The teachers are given training based on the guidelines of the NCERT which advocates a 'split up' model in which 6- to 8-day training is provided and 2 days of training consists of actual class observation so that teachers could emulate those methodologies in their

classrooms. As McLaughlin (1990) posits with efforts to 'implement' planned changes in curriculum practice, local factors are critical, often resulting in mutual adaptations. The realities of the classroom are far from the ideal setting. There is a lack of coordination among teachers who implement the curriculum as per their own beliefs. The students were expected to work in groups, and the teacher was expected to play the facilitator role. However, the teachers opined that this is inappropriate for young learners who have always relied on the teacher for their learning.

As teacher Saraswathy says,

> Although the objective is to promote independent learning it is not possible most of the time since the students are young learners who always turn to the teacher for guidance and assistance.

Adapting to the new activity-based teaching was unsettling for teachers as it challenged their long-held beliefs about teaching and learning in the traditional classrooms.

12.4.2 The Context of ESL Change

The context of operation varied from one school to the other. All the three schools visited were situated within the same district yet differed in terms of student population. The socioeconomic environment of the school shapes the attitude of the teacher which has an impact on the educational effectiveness of the policy implemented. All the three schools had students from different backgrounds which resulted in the teachers' talking a different approach in their teaching. Given the diverse background of the students, the culture of the schools was different, and they also differed in terms of the facilities, the operationalization, and the planning which varied from one school to another. Apart from that the external factors like access to learning materials, access to audiovisual resources, the class size, the teacher workload and the internal factors like teachers' working experience, their language teaching, the teaching conditions, their understanding of the syllabus, all had an impact in defining the context and the culture of the particular school. The opportunities and chances for policy implementation varied from one context to another which resulted in uneven implementation. As one teacher says,

> having to translate the English words to Tamil is a disadvantage but I am obliged to do so as it is the 'norm' here and teachers are expected to do that to facilitate learners' understanding. She adds:
>
> these students are never exposed to English. Very often I have to explain first in Tamil and then in English. For example: when they go back home they don't have the opportunity to practice these words. Therefore chances are that when they come back for class the next day some or most of them might have forgotten the word and I have to repeat the procedure again.

12.4.3 Working Culture in Schools

The location of the schools and the role of the principals in the governance of the school had an influence in the working culture of the staff. Principals who demonstrated strong leadership qualities and who seemed to be in control had better relationships with the staff and the students. Though the intention of the change in policy was to get weaker students to grasp the basic aspects of communication, most of the time the task is either half completed or sometimes skipped due to lack of supervision and sometimes because the classrooms are overcrowded. One school principal describes her school culture as 'positive.' School Principal B opines:

> I would say our culture is not so dynamic. I try not to be bureaucratic where possible and inculcate my teachers' ideas. There is no scope for extracurricular activities in my school given the location and the space.

The need for teamwork and collegiality was not viewed as urgent, and the teachers highlighted the teaching conditions which were not conducive as a reason for the difficulty in adopting the learner-centered approach. It is important for teachers to use multiple strategies as the students will benefit from some of the strategies that best suits their learning style. A similar view is expressed by Faltis and Hudelson (1998) that the more linguistically and culturally diverse the students are in the school community the greater the variety of teaching and learning strategy should be, with multiple opportunities to learn from peers as well as the teacher and the other adult staff. In this case, only the teachers in school C were inclined to learn provided they were given the opportunity to do so. Hollins (1996) argues that 'schools are shaped by cultural practices and values and reflect the norms of the society for which they have been developed.' In the case of the three schools, the reforms did not materialize positively as the expectations among the staff were different. Another culture among the teachers in terms of decision making related to their beliefs that directives should come from the principal, while the principals opined that teachers are given freedom to do what they like. Moreover, the teachers strongly believed that activity-based learning should be assisted mostly by the teachers thus leaving no space for creativity on the student's part. The teachers were entrenched in their own culture and had difficulty accepting that the learning culture has changed.

Though all the schools had experienced teachers, none of them experienced new ways to motivate students. As Hollins (1996), stated the governance of schools shape culture. In this study, all the principals asserted that they could not initiate reforms as the system did not empower the principals to be involved in the operations and planning of the school. The social norms were strongly prevalent. Observations as well as interviews with principals and teachers revealed that regular meetings were not the norm in their schools, and information was shared verbally in an informal manner. The teachers were not in favor of collaborative practices and did not like to change the strongly established rituals and procedures. The

perceptions of the community the students came from placed minimum expectations on students, and the schools did not have steps to monitor, evaluate, and improve their performance.

12.5 Conclusion

The capacity to implement change and maintain the momentum of change clearly differed from one school to another. There needs to be a greater articulation of the mission and the vision of the schools so that the teachers and the students could establish a better working culture toward a common goal. In effect, if teachers do not share the same essential perspectives on what constitutes desirable educational practice and do not maintain a common commitment to shared goals, they are unlikely to consistently work toward collective purposes. The individualistic school cultures, the capacity of the school to implement the change, and the context of the school in which change was attempted had an impact on the way ESL curriculum was implemented. The working culture in schools had an impact on the teachers' perceptions of their professional roles and objectives. Hence, culture and context were seen as interrelated, and teachers' view on culture in relation to adapting to the changes underscores the complexity of educational change.

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Chapter 13
An Exploratory Study on the Role of Blended Learning Practices to Achieve Twenty-First Century Skills Among Culinary Students at University in Malaysia

Dias Soeiro Joaquim and Balasubramanian Kandappan

Abstract The lecturer has a predominant place in the learning experience of the student, and one of the main roles is to generate creativity and critical thinking due to today's competitive working environment. As the usage of technology can be considered as common for the youngest generation of learner; blended learning, a pedagogic strategy, incorporates e-learning into the learning experience of the students. This study helps to explore the skills development of culinary students through blended learning practices during the class. The study also examines the readiness of the learners and their development of skills toward the twenty-first Century Skills.

Keywords Blended learning · RASE model · Asian culinary students' capabilities · P21 Framework

13.1 Introduction

Higher education requires quality of the learning experience and also must address changes related to the technological innovations. The improvement of ICT and today's involvement of technology in people's life has tremendously affected the way of living and changed new generations' behaviors and expec-

D.S. Joaquim (✉) · B. Kandappan
Taylor's University, Subang Jaya, Malaysia
e-mail: joaquim.soeiro@taylors.edu.my

B. Kandappan
e-mail: kandappan.balasubramanian@taylors.edu.my

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tations (Garrison & Vaughan, 2008). Kuh and Associate (cited in Garrison & Vaughan, 2008) highlight that engaging active learners is essential and mostly primordial to achieve a deep and significant learning experience. Bonk and Graham (2006) acknowledged the increase usage of blended learning in many universities due to the democratization and diversification of tools used to enhance the learning online. Therefore, blended learning could be proven to be efficient and effective for the student learning experience (Bonk & Graham, 2006; Garrison & Kanuka, 2004; Garrison & Vaughan, 2008). The present study does not only look at the integration of technology in the curriculum but investigate the cultural and professional dimensions involved in the learning experience through blended learning. It has to be clear that the study takes place in theoretical classes and not in practical or laboratory classes where it is required hands-on, technical, and psychomotor skills. More authentic and not enough student-centered theory classes require different attitudes and also behaviors from the students. Also, it can be observed that culinary students tend to be attracted by the activities done in the kitchen or pastry more than what they do in their theory classes. The integration of technology in the curriculum may be a way to interest the student and generate a more enthusiastic experience. However, didactic supports should be well planned to achieve a proper learning to develop skills and capabilities; in this study, the RASE model has been used to represent and reveal the student experience. The achievement of the eight Taylor's Graduate Capabilities (TGCs) and the 5C's is required for any students studying in this private institution in order to the development of key competencies. The usage of blended learning is a method to enhance interaction and interest in class, and the main focus of this study is to assess the achievement of international competitive key skills described in the P21 Framework. This study does not aim to generalize the findings but to explore the achievement of culinary students' capabilities through blended leaning. Researches can be found regarding the cultural or educational aspect of the learner, but it is rarer to find studies related to emerging paradigm such as the twenty-first Century Skills (DiasSoeiro & Kandappan, 2016). Balasubramanian, Jaykumar, and Fukey (2014) showed the interest from culinary students to use Web platform such as Edmodo. Can blended learning really enhance the skills and capability development of culinary students? Can blended learning contribute to the development of the twenty-first Century Skills? The objectives of this study are (1) to assess the achievement of the twenty-first Century Skills through blended learning, (2) to analyze the effectiveness of the usage of blended learning in the skill development, and (3) to investigate which key capabilities are mostly developed by culinary students. The following paper will be divided into four parts including a review of the existing literature, a description of the methodology, an analysis of the finding, and a conclusion of the research.

13.2 Literature Review

13.2.1 Asian Learning Style

In their recent study among culinary students from a private institution in Malaysia, DiasSoeiro and Balasubramanian (2016) revealed that the students tend to show e-learning preferences by sharing information and accessing resources rather than doing activities and evaluations. This study matches the empirical work of Hall and Ames (1987), and the studies from Kim (2003), Wong (2004), and Elliot and Tsai (2008) focused on the learning style of Asian students. Interestingly, they managed to show that Asian students would prefer more autonomy, collaboration, critical thinking, meta-cognition, and less "spoon feeding," heavy memorization, teacher-centered, or "rote learning." The lecturer has an essential role in the student learning experience to generate capabilities and abilities development such as creativity or critical thinking (Hall & Ames, 1987, Chap. 1). Also, it can be noted that similarities with western learning theories can be observed; Corcoran (2004) revealed that Behaviorism, Liberalism, Connectivism, and Humanism can be observed in the Confucian concept, a concept adopted in most Asian countries.

13.2.2 Blended Learning

A clear definition could be stated as informed by Bonk and Graham (2006, p. 5) "blended learning systems combine face-to-face instruction with computer-mediated instruction." Also known as hybrid, blended learning is part of the multiple pedagogic strategies available, containing between 30 and 79% of online learning (Allen & Seaman, 2003). Lecturers should be able to adapt and adopt various methods to ensure and enhance the learning experience of the learners (Bonk & Graham, Chaps. 1 and 3). Many researches exist regarding the conceptualization of blended learning. For instance, Singh (2003) enforces the usage of Khan's octagonal framework while Bonk and Graham (2006) or Garrison and Vaughan (2008) focuses on the effectiveness of this hybrid method. Garrison and Kanuka (2004) showed that competencies such as leadership could also be developed via blended learning and e-learning can help to enhance abilities. Furthermore, besides encouraging asynchronous learning (Bonk & Graham, 2006, Chap. 1; Singh, 2003), blended learning also could help to develop various set of skills such as creativity, collaboration, critical think, communication (Balasubramanian et al., 2014; Bonk & Graham, 2006) but also a sense of community (Rovai & Jordan, 2004). It is also important to emphasis on the pedagogic methods and tools used for both face-to-face and online learning. Garrison and Vaughan (2008, p. 57) defend that the teaching innovation to support blended learning should combine strategic

curriculum design, teaching strategies, and technology integration. In the case of many institutions, public or private, curriculum was already created; therefore, clashes may occur between the curriculum and the technology innovation. Despite the need for lecturer, thus face-to-face, to explain, draw, define, and certify information, the students tend to have a very important preference for online communication and interaction (Allen & Seaman, 2003; DiasSoeiro and Balasubramanian, 2016; Rovai & Jordan, 2004). Bonk and Graham (2006) denote flexibility, participation, and depth of reflection as the strengths of online learning but highlight also spontaneity, procrastination and human connection as weaknesses. Hence, the role of the lecturer is primordial in the choice of pedagogic strategies to ensure a proper learning.

13.2.3 Taylor's University Teaching and Learning Strategies

Taylor's Graduate Capabilities (TGCs) are capabilities integrated in the teaching and learning framework. Part of the philosophy of the University, the student should not acquire knowledge only but should also be able to apply and behave in a purposeful way (Taylor's TLF, 2016). The TGCs aim to help to create intentional learners holistically, and lecturers should encompass student-centered learning in their strategies. As part of the strategies of the University, blended learning is also adopted by the lecturers and should also aim to develop the eight TGCs which are discipline-specific knowledge, lifelong learning, thinking and problem solving skills, communication skills, interpersonal skills, intrapersonal skills, citizenship and global perspectives, and digital literacy.

13.2.4 Emergence of Capabilities Development

As per Jenkins (2009), cultural and social competencies are as important as digital and media literacies; however, those competencies will be developed in harmony with other key skills such as collaborative problem solving, adaptation, multitasking, distributed cognition, collective intelligence, networking, and negotiation. The P21 Framework has been developed in 2007 and aimed to showcase a new learning paradigm to enhance the competitive edge of all American students (Partnership for the twenty-first century learning, 2016). This new learning paradigm, shown in Fig. 13.1, focuses on key skills required in today's working environment necessary for the student's future career (Glossary of education reform, 2016; Jenkins, 2009; Learning-therories.com, 2016; Wagner, 2008). However, the term "Twenty-First Century Skills" does not only reflect set of skills or knowledge but also behavioral and attitudinal traits that one must have. As

knowledge can be found anytime anywhere, the role of the lecturer is transformational. P21 classify the above list of skill into few categories: learning and innovation skills, life and career skills, information, and media and technology skills. Another important notion, the evaluation methods, summative or formative, include also technologies in order to assess but also to let the learner experience and learn at the same time. The use of technologies also makes the learning experience more efficient and productive (Partnership for the twenty-first century learning, 2016).

13.2.5 RASE Pedagogical Model

RASE Pedagogic Model has been developed to support lecturer to use Learning management System such as Edmodo, Moodle, or Blackboard for instance. The model emphasizes on four areas, respectively, named Resources, Activities, Support, and Evaluation. These four dimensions ensure a proper learning experience and achievement of the learning outcomes by assuring (1) sufficient content available, (2) engagement, (3) collaboration, (4) back up, tools, documentations to help independent learning, and (5) assessing the learning.

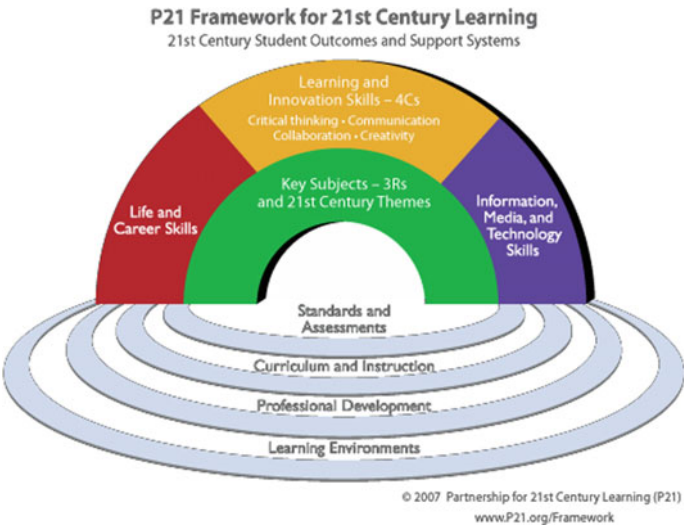

Fig. 13.1 P21 framework

13.3 Methodology and Proposed Conceptual Framework

This study applied a quantitative research approach using purposive sampling technique to address the objectives through a sample size of 285 students studying diploma, degree, and master's program in the culinary discipline from a private university in Selangor district, Malaysia. The study was analyzed with a clean data information from 249 respondents as final samples size. The questionnaire will cover the students profile, use of RASE pedagogical model-based blended learning practices to identify the twenty-first century skills. The online questionnaire was employed to investigate the student skills development by using blended learning platforms in alignment with TGC, and the results were mapped with the twenty-first Century skills. The data recorded automatically by Google drive for further analysis and findings Fig. 13.2.

H1: There is a significant relationship between TGC-based blended learning skills and the twenty-first century skills.

13.4 Data Analysis

It is a quantitative analysis using statistical analysis program (SPSS) to measure frequency, mean, and standard deviation (SD). The student learning skills through blended learning were analyzed by using a Likert-scale questionnaire by using a rating guide as follows: 4.01–5 = Strongly Agree, 3.71–4.00 = Agree, 2.71–3.70 = Neutral, 1.71–2.70 = Disagree, 1–1.7 = Strongly Disagree. Finally, the data collected were analyzed and grouped in terms of Resources, Activity, Support, and Evaluation (RASE) pedagogical model to understand which TGC the students are acquiring more.

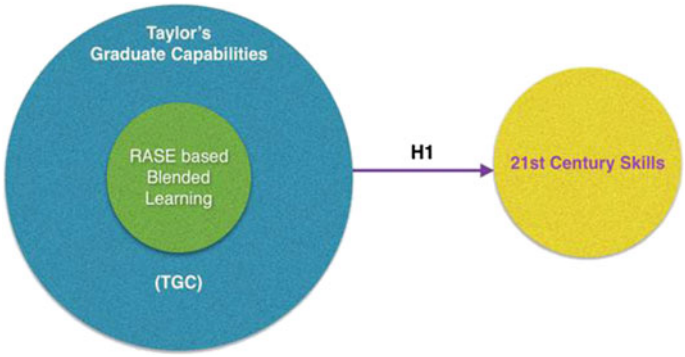

Fig. 13.2 Proposed conceptual framework

13.5 Findings and Discussion

The demographic of the 249 survey respondents was 111 male (38.4%) and 138 female (47.8%) with an age group of above 20 years was 164 respondents, 82 under 18–20 years, and in between 15 and 17 years was 3 respondents.

Table 13.1 gives the descriptive statistics of constructs related to TGC and twenty-first Century Skills (average mean score—AMS). Among all TGC, it is observed that the culinary students through RASE model-based blended learning approach have developed high communication skills (TGC4) and low critical thinking skills (TGC3) as the average mean score is 3.96 and 3.85, respectively.

The correlation involves measuring the closeness of relationship between two or more variables; it considered the joint variation of two measures (Churchill, 1995). The above Table 13.2 evidences the relationship between the independent variable and dependent variable in this study, i.e., there is a significant relationship between Taylor's Graduate Capabilities outcome and twenty-first Century Skill learning outcomes among the culinary students (result of correlation analysis is significant at the 0.01 level). Therefore, the proposed hypothesis (H1) was accepted, and the null hypothesis is rejected.

The result in Table 13.3 validates that there was a significant correlation with a R^2 of 0.998 at a significant level of $p < 0.000$. Taylors Graduate Capabilities has positive significant relationship on twenty-first Century skill through the blended learning practices among the culinary student ($\beta = 0.998$).

The below table results of Independence sample t-test for TGC and P21 century skills outcome among male and female is not significant as Leven's statistics $p = 0.597$ and 0.609 and also the t-statistics for equality of mean is 0.776 and 0.782 (2-tailed), respectively. Therefore, it indicates that there is no significant difference among gender in TGC and P21 learning skills as shown in Table 13.4.

Table 13.5 indicates that there is a significant relation of TGC1, TGC2 with all the twenty-first Century skills components whereby TGC3, TGC4, and TGC6 is not significant (coefficient p-values is higher than threshold value 0.05) with all

Table 13.1 Frequency analysis of TGC and twenty-first century skills

Item	AMS	Item	AMS	Item	AMS	Item	AMS
TGC1	3.93	TGC3	3.85	TGC5	3.94	TGC7	3.95
TGC2	3.93	TGC4	3.96	TGC6	3.88	TGC8	3.93

Table 13.2 Correlation of the study

Scale	TGC	21CS
TGC	1	0.998
21CS	0.998	1

Note **Correlation is significant at the 0.01 level (2-tailed)

Table 13.3 Regression analysis

Dependent variable: Twenty-first century skills				
Independent variable	β	*t*-value	*pb*	Hypothesis
H1: TGC-based blended learning have a close relationship with the twenty-first century skills	0.998	253.6	0.000	Accepted

Note $R^2 = 0.998$, $P < 0.000^b$

Table 13.4 Independent t-test

Variable	*N*	Mean	S.D.	Leven's test for equality of variance		*T*-test for equality of mean		
				F	Sig	*t*	*df*	Sig. (2-tailed)
TGC	M: 111 F: 138	221.3 219.6	45.7 43.8	0.280	0.597	0.285	247	0.776
P21	M: 111 F: 138	272.3 270.4	56.9 54.9	0.263	0.609	0.277	247	0.782

Table 13.5 Regression analysis of TGC and P21 Century Skills

	TGC1	TGC2	TGC3	TGC4	TGC5	TGC6	TGC7	TGC8
THEMES	0.000**	0.000**	0.259	0.674	0.000**	0.207	0.173	0.001**
P21LIS	0.000**	0.003**	0.394	0.856	0.000**	0.853	0.000**	0.000**
P21IMTS	0.000**	0.003**	0.000**	0.481	0.229	0.000**	0.000**	0.000**
P21LCS	0.000**	0.000**	0.133	0.045**	0.000**	0.070	0.000**	0.489

**Significant as coefficient of *p*-value <0.05

twenty-first Century skills. The results direct to have transformation in the blended learning practices to achieve and improve the TGC3, TGC4, and TGC6 in alignment with the twenty-first Century Skills.

13.6 Conclusion

As first objective, this study shows that the culinary students have the potential to achieve the skill development of the P21 Framework. The study informs that there is a strong need to enforce on key capabilities such as critical think and problem solving as well as financial, economic, business, and entrepreneurial literacy. This goes in line, with additional findings, with the results from Dias Soeiro and Kandappan (2016) where activities and evaluations involve less interest and abilities.

The second objective deals with the effectiveness of the usage of blended learning. As studied by Bonk and Grahams (2006), it is agreed that blended learning increase the interest and participation in class. All the series of capabilities and skills from the TGC or P21 Framework are more or less developed by the students. Also, the study tends to indicate that no difference can be noted among genders; therefore, there is positive impression of developing skills from any culinary students.

The last objective informs the most developed capabilities by the students. While the TGC developed focuses more communication skills, citizenship, and interpersonal skills, the capabilities developed under the P21 Framework are information literacy, media literacy, health literacy, environmental literacy, initiative and self-direction, and productivity and accountability.

As financial, economic, business, and entrepreneurial literacy as well as critical thinking and problem solving skills are the least developed skills by culinary student, there are potential gaps to be fulfilled. This is also aligned to the findings for TGC3 and 5, respectively, thinking and problem solving skills and intrapersonal skills. It is important to highlight that there is lack of creative and interpersonal skills among the culinary students which are considered as necessity for their career path.

The survey to only 249 students cannot be generalized, and similar studies could be done to investigate each TGC and each dimension in the P21 Framework. The Edmodo platform used was designed by one lecturer; therefore, the direction and strategies used and implemented could be involved in the analysis as qualitative input. Finally, the sample surveyed contents students from different culturo-educational backgrounds; consequently, the level of understanding of the question by the students may be questioned.

To conclude, the lecturers must have clear strategies to enhance the students' capabilities development. The usage of blended learning should not only be ludic and create interest but also enhance and develop key competitive skills.

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Chapter 14
Transforming Teaching-Learning Culture by Appropriate Use of Discrimination Index in Item Analysis

Benjamin Samraj Prakash Earnest, Prabal Bhargava, Anjan Kumar Das, Dato' Md. Tahir Md. Azhar, Nurjahan Mohd. Ibrahim and Roland Gamini Sirisinghe

Abstract The current policies on use of discriminative index (DsI) hinge on the teaching-learning culture of stratifying the class based on academic performance. Such a distinction may be acceptable to norm-referenced tests (NRTs) where the examinees are unselected and selection of the good from the bad students occurs by internal comparison of students' score. In criterion-referenced tests (CRTs) where students are examined for mastery of core competencies against an external criterion, poor DsI does not necessarily indicate poor question quality. Redesigning such use of DsI is necessary for transformation of teaching-learning culture.

Keywords Criterion-referenced test · Norm-referenced test · Discrimination index · Item analysis

B.S.P. Earnest (✉) · P. Bhargava · A.K. Das · D.Md.T.Md. Azhar
N.Mohd. Ibrahim · R.G. Sirisinghe
Taylor's University School of Medicine, 47000 Sungai Buloh, Selangor, Malaysia
e-mail: BenjaminSamrajPrakash.Earnest@taylors.edu.my

P. Bhargava
e-mail: Prabal.Bhargava@taylors.edu.my

A.K. Das
e-mail: Anitha.Ponnupillai@taylors.edu.my

D.Md.T.Md. Azhar
e-mail: Suresh.Ponnusamy@taylors.edu.my

N.Mohd. Ibrahim
e-mail: nurjahan.ibrahim@taylors.edu.my

R.G. Sirisinghe
e-mail: RolandGamini.Sirisinghe@taylors.edu.my

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14.1 Introduction

Norm-referenced test (NST) defines the performance of test takers in relation to one another. In NRT, we can use the frequency distribution and can rank students. Success in NRT is being able to achieve scores in the top percentile. Criterion-referenced test (CRT) defines the performance of each test taker without regard to the performance of others. Success in CRT is being able to pass the test by scoring above the mark determined by standard setting.

14.2 Two Types of Tests

CRT and NRT differ in several additional important ways, particularly their comparison targets (the criterion which is external in CRT and internal in NRT), the average item difficulty (usually more difficult in NRT than CRT) of the examinations, the resulting examinee score distributions (which is normally but broadly distributed in NRT and in CRT and shows clustering of marks around the higher values), and the types of scores typically reported. For CRTs, a simple classification decision is most commonly reported. This may be a classification of the examinee as pass/fail. For NRTs, a score, rather than a classification, is more often reported; percentile ranks or scale scores are frequently used. But it is still considered agreeable to give grades of performance in CRT like a norm-referenced test. A normal distribution is not typical for CRT programmes. If the score distribution for a CRT did look like the normal distribution, depending on the location of the passing score, it would probably suggest that only a small proportion of the examinees displayed mastery.

There is nothing basically different between a criterion-referenced or norm-referenced test in the type of questions used or the way the tests are conducted. For example, if you conduct a test to select students for a course with 20 seats but has 40 applicants, it is a NRT. Having selected the 20 best applicants for the course and having trained them all equally in core competencies required to qualify, if you conduct a test to assess their mastery of the subject, it is a CRT.

14.3 Item Analysis

Item analysis is often done to improve quality of the questions using difficulty index (which is the proportion or percentage of students who answer an item correctly), discrimination index (see below), and point biserial (which is a comparison of the mean score of students who chose the correct answer to the mean score of students who chose the wrong answer). Distractor analysis may also add to the information on quality of the questions.

14.4 Discrimination Index

Discrimination index (DsI) is often widely used to assess the quality of tests conducted using multiple-choice questions. DsI is calculated as the ratio of the difference between the correct answers scored by the top scoring group and the low scoring group to the total number of students in each group.

$$\text{DsI} = \frac{U}{N_U} - \frac{L}{N_L}$$

where

U no. of students in the top group getting the item correct
L no. of students in the bottom group getting the item correct
N_U total number of students in the top group
N_L total number of students in the bottom group.

DsI values range from −1 to +1. DsI is classified as follows for grading the quality of the questions. For examinations with a normal distribution (NRT), a discrimination index of 0.3 and above is good; 0.6 and above is very good. Values close to 0 mean that most students performed the same on an item irrespective of their test score. The index should never be negative (Table 14.1).

14.5 A Caution in Interpreting Item Analysis Results

However, such statistics must always be interpreted in the context of the type of test given and the individuals being tested. More than 40 years ago, Mehrens and Lehmann, (1973) provided a set of cautions in using item analysis results:

1. Item analysis data are not synonymous with item validity. An external criterion is required to accurately judge the validity of test items. By using the internal criterion of total test score, item analyses reflect internal consistency of items rather than validity.
2. The discrimination index is not always a measure of item quality. There is a variety of reasons an item may have low discriminating power: (a) extremely

Table 14.1 Discrimination index interpretation

>0.30	Good
0.10–0.30	Fair
Equal to 0	No discrimination. Students got the item right or wrong irrespective of their test score
Negative	Poor. The item was flawed or miskeyed

difficult or easy items will have low ability to discriminate, but such items are often needed to adequately sample course content and objectives and (b) an item may show low discrimination if the test measures many different content areas and cognitive skills. For example, if the majority of the test measures "knowledge of facts", then an item assessing "ability to apply principles" may have a low correlation with total test score, yet both types of items are needed to measure attainment of course objectives.

3. Item analysis data are tentative. Such data are influenced by the type and number of students being tested, instructional procedures employed, and chance errors. If repeated use of items is possible, statistics should be recorded for each administration of each item.

14.6 Item Characteristic Curve (ICC)

If we plot the test score in the x-axis and the probability of getting a correct answer to an item in the y-axis, we get a curve as in Fig. 14.1a. The greater the slope with which the mid-section of the curve rises, the better the discrimination index. When the slope of the mid-section of the curve does not rise rapidly, as in Fig. 14.1b, the discrimination index is poor. Students have almost equal chance of arriving at the correct response irrespective of their test score. This curve is therefore nearly a straight line. When the DsI is negative, the curve is reversed (as in Fig. 14.1c). This is considered undesirable for an item.

If we aim for good DsI for all questions, what we really aim for is low probability of the "low scoring group" getting the answer correct for all questions (and high probability of the "high scoring group" getting the answer correct in all questions) giving a distribution of marks as shown in Fig. 14.2. This is desirable in a NRT (where the aim of the test is to stratify students), but not so in a CRT. Hence, it is generally considered that the DsI is a good index of question quality in NRT but not in CRT. But one can argue that using questions with good DsI in a CRT may help distinguish the best from the mediocre.

Let us presume a test with 20 items. If we are to achieve high or perfect DsI for each item from 1 to 20, then the probability that the low scoring group answers correctly (for each item from 1 to 20) is low and the probability that the high scoring group answers correctly (for each item from 1 to 20) is high. If the probability of answering correctly is low for each and every question, the low scoring group should score poorly in the examination. This means a low scoring group answering incorrectly for all/most questions is a sine qua non for such a high DsI to be achieved for all questions. Similarly, the high scoring group will have near perfect scores as their probability of answering every question correctly is high.

The implication of this is that we will need a mark distribution where the low scoring group scores very low and the high scoring group very high. Indeed, for achieving the perfect DsI for every question, the low scoring group must fail the

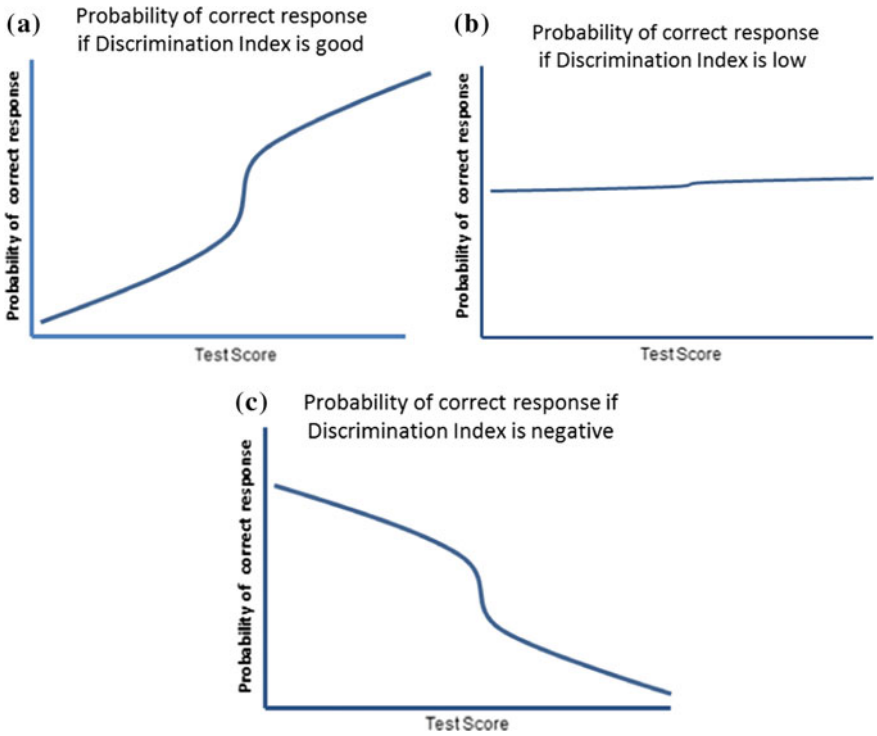

Fig. 14.1 Item characteristic curves (*ICCs*) for different values of discrimination index (*DsI*)

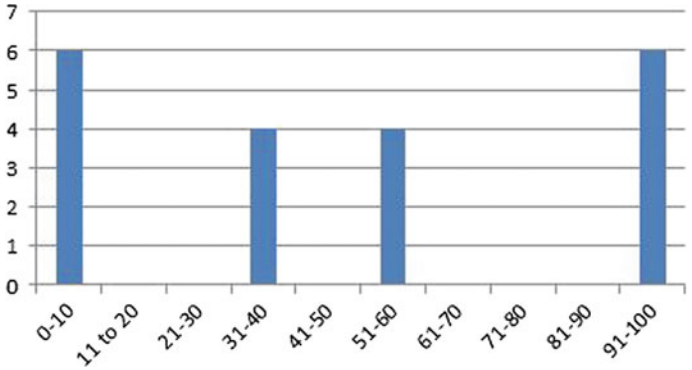

Fig. 14.2 Mark distribution for perfect DsI for all questions

examination scoring "0%" each and the high scoring should score "100%" each. But such a mark distribution would be very unrealistic (Fig. 14.2) either in a NRT (where we expect a normal distribution) or a CRT (where we expect clustering of marks around higher values).

14.7 Discrimination Index in NRT

A broad distribution of marks would be acceptable to NRT. The maximum percentage of students that can score well with a "perfect" DsI is 67 or 73% (depending on whether 33% or 27% students are used to form top/bottom groups and student numbers). The corresponding mark distribution (Fig. 14.3) is still unrealistic. The loss of a "perfect" top and bottom groups (as would happen with a realistic mark distribution) tends to lower the value of DsI in a test (Fig. 14.4). So the perfect DsI cannot be an ideal to strive towards and most questions in a NRT will have DsI values from 0.4 to 0.6.

14.8 Discrimination Index in CRT

The lack of a "perfect" top and bottom groups tends to lower the value of DsI in a CRT too. Further, in a CRT, students typically score well. Students' good performance rates higher than 67–73% are only possible with a trade-off in the value of discrimination index (Fig. 14.4). Hence, most questions in a CRT will have DsI values from 0.0 to 0.3. So some factors (other than question quality) tend to influence the DsI in a test. It is important to recognize that an item which half of the students answer correctly has the highest possible discriminating potential.

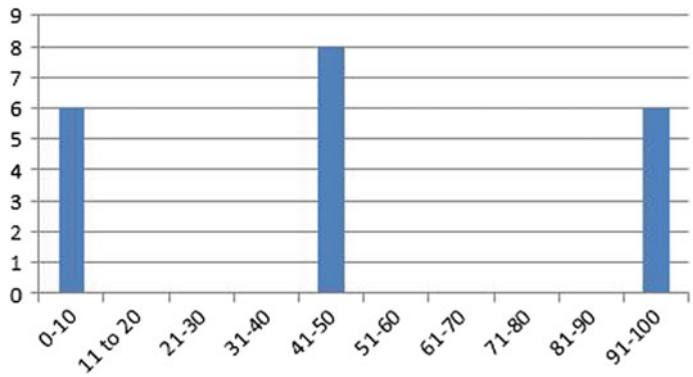

Fig. 14.3 Mark distribution for perfect DsI for all questions and maximum possible pass percentage

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1			1	2	3	4	5	6	7	8	9	10		
2	Discrimination Index→		0.666667	0.5	0.666667	0.5	0.666667	0.833333	0.833333	0.666667	0.833333	0.666667	MARK	
3	Good Students	1	C	C	C	C	C	C	C	C	C	C	100	PASS
4		2	C	C	C	C	C	C	C	C	C	C	100	PASS
5		3	C	C	C	C	C	C	C	C	C	C	100	PASS
6		4	C	C	C	C	C	C	C	C	C	C	100	PASS
7		5	C	C	C	W	C	C	C	C	C	W	80	PASS
8		6	C	W	C	C	C	C	C	W	C	C	80	PASS
9	Average Students	7	C	C	C	C	C	C	C	W	W	W	70	PASS
10		8	C	C	C	C	C	C	C	W	W	W	70	PASS
11		9	C	C	C	C	C	C	C	W	W	W	70	PASS
12		10	C	C	C	C	C	C	C	W	W	W	70	PASS
13		11	W	W	W	W	C	C	C	C	C	C	60	PASS
14		12	W	W	W	W	C	C	C	C	C	C	60	PASS
15		13	W	W	W	W	C	C	C	C	C	C	60	PASS
16		14	W	W	W	W	C	C	C	C	C	C	60	PASS
17	Bad Students	15	C	C	C	C	C	W	W	W	W	W	50	PASS
18		16	W	W	W	W	W	C	C	C	C	C	50	PASS
19		17	C	C	C	C	C	W	W	W	W	W	50	PASS
20		18	W	W	W	W	W	W	W	W	W	W	0	FAIL
21		19	W	W	W	W	W	W	W	W	W	W	0	FAIL
22		20	W	W	W	W	W	W	W	W	W	W	0	FAIL
23	Difficulty Index→		0.6	0.55	0.6	0.55	0.8	0.75	0.75	0.5	0.55	0.5	Pass%= 85	
24			C - correct, W - wrong											

Fig. 14.4 A failure rate of <27–33% is possible only with a trade-off in the value of DsI

14.9 Method

This study was set in Taylor's University, Clinical School, Sungai Buloh, Malaysia. The student population was 4 groups of 3rd- and 4th-year medical students in Internal Medicine, Ophthalmology and Obstetrics & Gynaecology postings. The student groups ranged from 11 to 16 students each. Each group underwent a SBA-MCQ test with 20–30 items each at the end of their respective postings. Optical mark reader (OMR) was used to score the test results. The OMR also uses software to produce DfI and DsI of each question in the SBA-MCQ test. We also used a spreadsheet (MS Excel) to further analyse the results to group the achieved DsI into 3 groups, i.e. <0, 0–0.3, and >0.3.

14.10 Results

A total of 110 SBA MCQs were analysed from 4 different tests. We found that the DsI was mostly in the range from 0 to 0.3 as expected in a CRT with a smaller percentage of question in the other groups (<0 or >0.3). 53.33–66.67% questions scored DsI in the range from 0 to 0.3. DsI of >0.3 was seen for about 23.33–40% of questions, and DsI of <0 was seen for 3.33–16.67% of questions in different tests. Overall (Fig. 14.5) DsI of 59.1% of items was in the range of 0–0.3, 10.9% < 0, and 30% > 0.3. Of the 10.9% (12/110) items with DsI < 0, about 4.55% (5/110) items had difficulty index in the range of 0.3–0.7, while others had either too high or low difficulty index. Since an item which half of the students answer correctly (hence difficulty index will be close to 0.5) has the highest possible discriminating potential, these are the items which may require scrutiny.

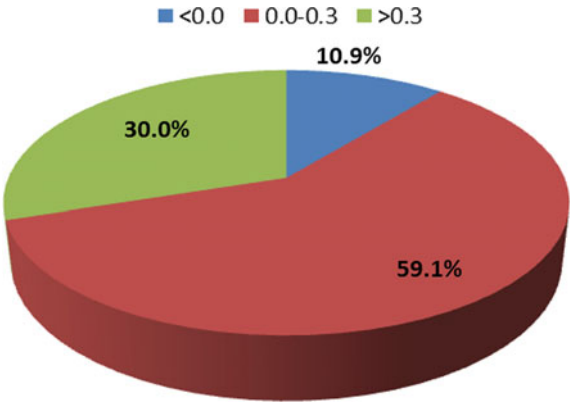

Fig. 14.5 Distribution of discrimination index values

14.11 Conclusion

It is generally agreed that discriminative index is a good measure of question quality in item analysis of single best answer MCQ tests in norm-referenced but not in criterion-referenced tests. In a CRT, a low DsI does not necessarily indicate that the question is of low quality. It is important to have good DsI value for questions with DfI in the middle range. But if the difficulty index is very high or very low, indicating that most candidates were or were not able to answer questions correctly, the DsI has little role in determining item quality.

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Chapter 15
Item Difficulty and Discrimination Index in Single Best Answer MCQ: End of Semester Examinations at Taylor's Clinical School

Keng Yin Loh, Ihab Elsayed, M.I. Nurjahan and G.S. Roland

Abstract Single best answer (SBA) multiple choice question (MCQ) is a reliable assessment tool used in many medical schools in both undergraduate and postgraduate examinations. However, in order to know the quality of the paper it is recommended to perform item analysis on the difficulty index and discrimination index of the SBA MCQ paper. In the Taylor's Clinical School, SBA MCQs are used as the major tool of assessment for the theory component in the clinical phase of the medical program. The objective of this paper is to answer two questions: (1) What is the level of difficulty and (2) What is the discrimination index of end of semester (EOS) 9 SBA MCQs summative assessment in Taylor's Clinical School? The EOS 9 papers and their scores were retrieved and analysed using Smart Scan computer software. The total score of SBA MCQ was 100, and the pass mark was 50. In this cohort, the scores of the candidate ranged from lowest being 40 to highest at 83.3 with the mean score of 66.4. Analysis of difficulty index showed 36.7% of the SBA questions had difficulty index (p) above 0.8 which were categorised as easy, 55.5% being optimal (p-value 0.3–0.8) and remaining 8.3% were difficult (p-value below 0.3). However, for the discrimination index (d), majority (51.7%) of the questions had poor discrimination index ($d < 0.2$) and negative discrimination index (10%). This pilot study on item analysis for the EOS 9 SBA MCQ papers has demonstrated it is crucial to review the SBA MCQ papers especially those questions which are shown to have a negative discrimination index. This pilot study enables the clinical teachers to understand better the level of difficulty in writing SBA MCQs and identifying factors leading to poor discrimination index as part of the teaching and learning culture.

Keywords Item · Difficulty · Discrimination · Index

K.Y. Loh (✉) · I. Elsayed · M.I. Nurjahan · G.S. Roland
Taylor's Clinical School, 19 & 21, Dataran Villa Putra Jalan
Villa Putra 1, 47000 Sungai Buloh, Selangor, Malaysia
e-mail: KengYin.Loh@taylors.edu.my

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15.1 Introduction

SBA MCQ is an important assessment tool used in many medical school for undergraduate and postgraduate medical examinations. SBA has been proven to have high reliability per hour of testing, and broad domains can be tested at higher cognitive levels of learning. It is commonly used in many summative examinations, exit examination and recertification examination in the medical field (Schuwirth & Vleutan, 2003).

In Taylor's Clinical School, SBA is the main tool of assessment for end of semester (EOS) summative assessment for the theory component throughout the clinical phase of training in undergraduate medical program. The EOS theory paper is an integrated paper which comprises all the subjects taught within the semester. There are sixty SBA questions in the EOS theory paper. Each SBA comes with a short clinical scenario and four options of probable answer. One of the options is most accurate answer, while the other three are the distractors. The candidate is required to select only one answer which they consider as the best answer from the four options provided. Each question correctly answered will be awarded one mark. The marks will be totalled up to produce the final score for the SBA paper. There is no negative marking for SBA paper. Total score is 100, and pass mark is set at 50.

The aim of this paper is to evaluate the level of difficulty and discrimination index at the end of the semester 9 assessment at Taylor's Clinical School. EOS 9 is chosen because it has a total of 58 students which is the largest cohort in the clinical school. This study focused on the following two research questions: (1) What is the level difficulty of EOS 9 SBA questions across various clinical discipline? (2) Are the SBA questions having acceptable level of discrimination index?

Study approval was granted by the dean and the clinical school program director. The results of this study will not affect the candidates' performance in any way.

15.2 Methods

The EOS 9 SBA paper and the scores of the candidates were retrieved from the clinical school academic office. The difficulty index is defined as proportion of candidates who attempted the questions and answer correctly, commonly denoted as "*p*"-value. The *p*-value can range from 0.0 to 1.0; hence, the higher the *p*-value indicate the question is easier. On the other hand, the difficult the questions will have a low *p*-value.

The discrimination index (*d*) measures how well an item is able to distinguish candidates who are upper performers (good) and those lower performers. The upper and lower performers are defined by the upper 27% and the lower 27% of the total candidates' scores arranged according from the highest score to the lowest score in the overall marks in this examination (Sim & Rasiah, 2006). The range of discrimination index is from −1 to 1.0; a value of 0.2 and above is regarded as

satisfactory, while a negative value indicates the lower performers did better than the upper performers. Item with negative discrimination values is recommended to be reviewed (Aggarwal, 1986).

The formula to compute item difficulty index (p) and discrimination index (d) is as follows: (Ebal, 1972).

Item difficulty index	$p = \frac{N_p}{N}$	N_p total number of candidates answer correctly N total number of candidates who take the test
Item discriminating index	$d = \frac{U_p - L_p}{U}$	U_p number of candidates in the upper group (27%) who answer correctly L_p number of candidates in the lower group (27%) who answer correctly U total number of candidates who take the test

The results of the EOS 9 were tabulated, and both the difficulty index and discrimination index were generated by the *Smart Scan* version 3.1a software.

15.3 Results

There were 58 candidates who sat for the EOS 9 SBA MCQ paper. The total score of SBA MCQ was 100, and the pass mark was 50. In this cohort, the scores of the candidate ranged from lowest 40 to highest of 83.3 with the mean score of 66.4 (Table 15.1). Analysis of difficulty index showed 36.7% of the SBA questions had difficulty index (p) above 0.8 which were categorised as easy, 55.5% being optimal (p-value 0.3–0.8) and remaining 8.3% were difficult ($p < 0.3$). Comparison across all the different subjects tested showed almost similar range of difficulty index (Table 15.2).

The discrimination index of EOS 9 showed only 15% of the SBA questions were in the category of good discrimination index ($d > 0.4$). More than half of the questions were in the category of poor discrimination index ($d < 0.2$). There were 10% of the questions with negative discrimination index which need to be reviewed (Table 15.3).

Table 15.1 Central tendency of EOS 9 SBA MCQ scores

Total number of candidates	58
Mean	66.4
Median	68.3
Mode	70.0
Standard deviation	8.9
Minimum	40.0
Maximum	83.3

Table 15.2 Difficulty index across different clinical subjects in EOS 9 SBA MCQ paper

Difficulty index (p)	Number (n)	<0.30 (difficult)	0.30–0.80 (optimal)	>0.8 (easy)
Family medicine	11	1	5	5
Ophthalmology	11	1	5	5
Otorhinolaryngology	11	0	7	4
Psychiatry	11	1	5	5
Anaesthesiology	11	2	6	3
Integrated session	5	0	5	0
Total paper	60	5	33	22
Percentage	100%	8.3	55.0	36.7

Table 15.3 Discrimination index across different clinical subjects in EOS 9 SBA MCQ paper

Discrimination index (d)	Number (n)	Negative	<0.2 (poor)	0.2–0.39 (marginal)	>0.4 (good)
Family medicine	11	3	5	2	1
Ophthalmology	11	0	7	3	1
Otorhinolaryngology	11	0	4	3	4
Psychiatry	11	1	7	3	
Anaesthesiology	11	1	7	2	1
Integrated session	5	1	1	1	2
Total paper	60	6	31	14	9
Percentage	100%	10.0	51.7	23.3	15.0

15.4 Discussion

The undergraduate medical program (MBBS) at Taylor's University, Malaysia, is new, and the first cohort was enrolled in 2010 with only 17 students. The second cohort being the largest with 58 students is currently in their final year. SBA MCQs remain the major tool of assessment for the theory component in summative assessment in clinical years; it is therefore crucial to perform item analysis to determine the difficulty index and discrimination index of these SBA MCQ questions. The analysis will be able to identify the possible weakness in these papers and assist the clinical teacher to review and improve further in the quality of assessment in clinical phase.

The results of this study had demonstrated 55.5% of the questions had accepted difficulty index of 0.3–0.8 and only 8.3% were difficult. However, the percentage of easy questions was rather high 36.7%. One possible reason for this is because in Taylor's Clinical School used outcome-based curriculum and the criterion-referenced assessment system is applied. In criterion-referenced assessment, the emphasis is on achieving specific outcome at the end of the learning; therefore, many item tested may give a difficulty index (p-value) above 0.9 or even higher.

The other reason could be the question was set at a level which was appropriate for lower semester. On the other hand, if the difficulty index is very low (<0.3), this indicates the question is difficult in which the questions may have been constructed at a level higher than the semester's learning outcome.

The analysis on discrimination index in EOS 9 showed more than half of the questions belong to poor discrimination. Only 15% were in the category of good discrimination and 23.3% were marginal. The category of marginal and poor discrimination index needs to be revised. There were 10% of questions had negative discrimination index. These questions need to be thoroughly reviewed as possible reasons reported for negative discrimination were data entry error, ambiguous or misleading questions. It is usually recommended that questions with negative discrimination should be rejected.

15.5 Conclusion

Item analysis for SBA MCQ is crucial to ascertain the level of difficulty at the end of semester summative assessments at Taylor's Clinical School. In this study involving EOS 9, the SBA MCQ paper was set at the appropriate accepted level of difficulty. However, the majority of the questions had poor discrimination index and negative discrimination index. Further analysis of these questions is necessary in order to improve the quality of the SBA MCQ paper. This pilot study on item analysis of SBA MCQ paper enables the clinical teacher to understand better the level of difficulty in writing SBA MCQs and identifying factors leading to poor discrimination. It is recommended that similar item analysis should be conducted for all SBA papers in summative assessments at clinical school.

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Chapter 16
Types of School, Medium of Instruction, and Students' Academic Performance in Business Studies at Pre-university

Chin Sok Fun

Abstract Entering different types of schools, each with its own teaching and learning culture and exposure to a different medium of instruction, may have an effect on students' learning experience and, hence, impact their academic success. This study aims to establish the relationship between the types of schools, medium of instruction, and academic achievements at Pre-university. The data show that students from non-international schools perform better than those who attended international schools at Pre-university. In addition, the results found that students whose medium of instruction in school was Malay did not perform as well as those who used other languages at Pre-university.

Keywords Background · Pre-university · Business studies

16.1 Introduction

In Malaysia, the government-funded schools offer free education to children of its citizens, while private schools charge fees for their preschool, primary, and secondary education. In the last few decades, private schools in Malaysia have emerged as an important source of education at all levels. Dronkers and Avram (2010) suggested that the greatest advantage of private schools is that they are more independent and self-sustaining. *The Malay Mail online* (2014) reported that an increasing number of middle-class parents are willing to spend up to RM 100,000 a year to enroll their children in international school to ensure their children are exposed to a rounded educational environment equipped with top-notch facilities; as a result, fees in international schools are expected to rise from 8 to 15% every year. Hence, the central question is whether the children who graduate from private institutions outperform those from national schools in their future studies? In view of the increasing demands of employers, business courses are in demand, and

C.S. Fun (✉)
Taylor's College Subang Jaya, Subang Jaya, Malaysia
e-mail: sokfun.chin@taylors.edu.my

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Pre-university studies are a popular pathway for post-secondary school students, thus, leading to the main research question this study:

- Is there any relationship between type of schools attended by students and their academic performance in business studies at Pre-university level?

One of the main differences between schools in Malaysia is the medium of instruction used (Lim, 2013). The Malay language (Bahasa Malaysia) is used as the language of instruction in all national schools, except for *Sekolah Jenis Kebangsaan Cina* (national Chinese type) and *Sekolah Jenis Kebangsaan Tamil* (national Tamil type) schools. In the national Chinese-type schools, Mandarin Chinese is the main language of instruction while Tamil is used in national Tamil-type schools. All national secondary schools need to adhere to the national-level curricula set by the Ministry of Education where the main medium of instruction is the Malay language. In international schools, English is the main language of instruction while in Chinese independent high schools, Mandarin is used as the main medium of instruction. This study attempts to understand whether the differences in the language of instruction used in different schools will produce different levels of academic performance, and this leads to the secondary research question:

- Is there any relationship between medium of instruction used in different schools and the students' academic performance in business studies at Pre-university level?

16.1.1 Significance of This Study

The school's social environment has broad influences on students' learning and growth, including major aspects of their social, emotional, and ethical development (Schaps, 2005). Learning environment plays an essential role in shaping the innate potentials of an individual, and school has always been regarded as an important factor (Lawrence & Vimala, 2012). The results of this study, if found significant, will provide useful insights to aid parents in their selection of schools and help to understand the impact of the school environment factor on academic achievement.

16.1.2 Literature Review and Hypothesis Testing

According to the Ministry of Education, Malaysian children are required to attend primary school when they reach seven, and they will take a national exam in Primary Six before moving on to lower secondary school. Most Malaysian students will go to national school except for some upper-class elite, or parents who had

their education abroad who may choose to send their children to private schools or home school (Lim, 2013). This means children spend most of their time in school, and hence, the school environment exerts a different influence on performance through curricula, teaching techniques and relationships. A conducive learning environment is crucial for fruitful learning of the children (Lawrence & Vimala, 2012).

Schools may differ in terms of educational facilities which also relate to the academic success of a student (Hussain et al., 2012). Suleman, Aslam, and Hussain, (2014) examined secondary school students in Pakistan, and they suggest that sufficient school facilities stimulate academic achievement while unattractive and old school buildings, insufficient teaching staff, overcrowded classrooms etc., will have negative effects on the academic achievement of the institutions. In Kenya, Korir and Kipkemboi (2014) found that adequate learning facilities alongside helpful teachers who provide regular consultation are able to arouse interest in the students and encourage them to study hard. In Malaysia, Usaini and Abu Bakar (2015) found that school supported by modern technology such as computers and the Internet-enriched laboratory and library learning experiences. Crosnoe, Monica, and Glen (2004) found that national or private schools have very different class sizes and sources of funding; private schools tend to have both better funding and smaller class sizes than national schools. The additional funding for private schools leads to better academic performances and more access to resources which help to enhance academic achievement (Eamon, 2005). In Malaysia, most international schools which comprise up to 20 students have small class sizes which are ideal for effective group work and ensure the teacher is able to provide individual attention to every student (Malaysian Digest, 2015). In the case of national schools with a class size of up to 50 students, the teacher faces problems in terms of providing personal attention, student acquiring reading skills, and being unable to effectively carry out remedial and enrichment activities (Hashim, 1999). Though previous research acknowledges conducive learning in private school may enhance student's academic achievement (Eamon, 2005; Crosnoe et al., 2004), there is no study done to understand whether the students who attend private school will also excel at post-secondary education, which prompts the first hypothesis:

H1: There is a significant relationship between the types of school attended by the students and their academic performance in business studies at Pre-university level.

Language acquisition correlates with higher academic performance on standardized test measures (Turnbill, Hart, & Lapkin, 2003). Language proficiency helps in participating effectively in class discussions, performance, and note-taking, and these facilitate academic development (Chin & Lim, 2014). Malaysia has been running a bilingual system of education since its independence in 1957. English is an important second language alongside the national language, Malay. This system intends to achieve a balance between national and international needs, through language educational policies (Gill & Kirkpatrick, 2013). Malaysian children are exposed to six years of primary education and learn the English language as a compulsory subject. When they enter secondary school, English is taught again as a

core subject before they enroll in a tertiary program. Abe, Ilogu, and Madueke (2014) discovered that, in Nigeria, it is while in the process of learning English that students developed interest, self-motivation, hard work, persistence, and focus, the qualities leading to better academic results. His study is supported by Chin and Lim (2014) who found that in Malaysia, those who achieve better results in their SPM English forecast grades attained better academic results at Pre-university level. However, apart from international schools, most other secondary schools in Malaysia do not use English as the medium of instruction. It would be interesting to understand whether using English as a medium of instruction in secondary school will lead to better academic achievement in further studies as there has been a lack of research done in this area, thus, forming the second hypothesis:

H2a: There is a significant positive relationship between practicing English as a medium of instruction in secondary school and academic performance in business studies at Pre-university level.

The national language of Malaysia, Bahasa Malaysia, was first officially endorsed by the Education Committee Malaysia in 1956; at the same time, Malay-medium schools were endorsed as the national schools and vernacular schools as national-type schools (Malakolunthu & Rengasamy, 2012). According to Puteh (2012), the achievements of Malay-medium of instruction universities (UKM, UTM, and UPM) at post-graduate level are outstanding. Since 1990, thousands of such students have produced Malay language theses in science. These Malay scholars have coined much of the terminology used in biology, especially in the areas of animal and tree research (Puteh, 2013). Nevertheless, there has been lack of study to understand the impact of adopting this national language as medium of instruction at secondary school level on the post-secondary academic results, hence, the results of this study, if found significant, will provide feedback to policy makers, thus, prompting this hypothesis:

H2b: There is a significant relationship between implementing Malay as a medium of instruction in secondary school and academic performance in business studies at Pre-university level.

In Malaysia, the Chinese community has formed a comprehensive system of education with Chinese as a major medium of instruction (Peow, 2013). The curriculum for the Chinese language taught in Malaysia suits the local education policy, yet, the pupils' moral self-cultivation has always stressed that teaching should be in the Chinese language (Peow, 2013). The learning of the Chinese language is very different from other languages like English and Malay as it demands a deep understanding of characters and phrases that express a full range of nuances of meaning (Ku, 1998). The different Chinese characters are capable of forming a large number of creative combinations to develop tens of thousands of expressive phrases and sayings. Peow (2013) analyzed that Chinese linguistic knowledge is also being focused on in the curriculum and made examinable. The Chinese language learner needs to employ a great deal of effort to keep up with the demands of their lesson, and this may have a significant positive impact on improving their ability to learn other subjects which are, presumably, much easier to learn and pick up, hence, forming the hypothesis:

H2c: There is a significant positive relationship between practicing Chinese as a medium of instruction in secondary school and academic performance in business studies at Pre-university level.

16.2 Methodology

There were 127 respondents involved in this study. These were business students who enrolled in the 2014 class of a Pre-university program at a private institution. Business students are those enrolled for either Accounting or Economics or both. The respondents who joined the program on the first day of the semester were asked to complete, under supervision, a survey form to record their background, which included type of primary and secondary school(s) attended, and medium of instruction used in the school. The results achieved in the Accounting and Economics subjects in the first semester of the program were collected. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) since, in this nonparametric tests, the test of normality is not required (Chin & Lim, 2014). The data are examined using ordered logit regression, a regression model first considered by McCullah (1980) for ordinal dependent variables. In this study, the business students' academic performance was measured in ordinal data scales (A, B, C or, fail), so the model is very suitable for this study.

16.3 Results and Discussion

At secondary school level, most of the respondents went to national schools (made up 69% of the sample), followed by international schools (10%) and Chinese independent schools (5%). In terms of medium of instruction, Chinese Mandarin is the choice of the largest number at primary school level, comprising 67% of respondents, followed by English at 20% and, then, Malay at 13%. However, as they moved up to secondary school level, English becomes the main medium of instruction (47%), followed by Malay (35%) and, lastly, Chinese (18%).

The model fitting information shows sign at 0.015, this means that the data are significant as $P < 0.05$. The Pseudo R-Square shows Nagelkerke at 0.137, indicated that the independent variables explained 13.7% of the variation of the dependent variable. The model fitting information shows that the independent variables, medium of instruction used at secondary school and types of school attended, are fitted in the regression. The results of the regression are reported in Table 16.1.

The ordered regression model indicates that implementing Malay as a medium of instruction in secondary school has a significant negative relationship with Pre-university-level Accounting or Economics or both, significant at 0.021, hence, H2b is accepted. This study suggests that the Malay language, the main language in teaching and learning in national school, does not help students achieve in

Table 16.1 Results of the regression

		Estimate	Std. error	Wald	df	Sig.	95% Confidence interval
							Lower bound
Threshold: pre-U grade	Fail	−3.849	1.316	8.551	1	0.003	−6.428
	C	−2.494	1.292	3.727	1	0.054	−5.027
	B	−1.197	1.282	0.872	1	0.35	−3.709
Medium of instruction: secondary school	Malay	−0.897	0.389	5.32	1	0.021	−1.659
	Chinese	0.394	0.508	0.6	1	0.439	−0.602
	English	0[a]	–	–	0	–	–
Type of schools	National school	0.313	0.492	0.404	1	0.525	−0.652
	International school	−1.938	0.753	6.623	1	0.01	−3.413
	Chinese independent high school	−1.158	0.957	1.464	1	0.226	−3.034

post-secondary school business studies, thus, rejecting findings by Puteh (2012, 2013). Mostafa (2002) explained that bilingualism among Malay students has better receptive ability in both the English and Malay languages as compared to their expressive ability in the same languages. With respect to second language learning, this indicates that the students' bilingual ability is more inclined toward "receptive bilingualism"; this means they are able to understand two (i.e., Malay and English) languages but able to express themselves in only one (i.e., Malay) language. In the case of non-Malay students who need to learn multiple languages (Chinese, Tamil, Malay, and English), the learners may be able to understand a few languages but able to master only one. For example, Ting (2013) found that most Chinese students who completed Chinese primary school before proceeding to study in Malay secondary school which uses Malay as its medium of instruction still regard Chinese Mandarin as their best spoken language, followed by family dialect and then English. At Pre-university level, English language proficiency will give an advantage to students who pursue further studies in courses conducted in English (Abe et al., 2014). Lack of linguistic knowledge can, thus, lead to deficits in their comprehension performance and, hence, academic performance (Mohd Zin & Rafik-Galea, 2010).

With a significance of 0.439, there is not enough evidence to conclude whether practicing Chinese as a medium of instruction in secondary school has an effect on Pre-university-level Accounting or Economics or both and therefore, H2c is rejected. The respondents whose medium of instruction is Chinese are mostly Chinese students. In the national secondary or primary school system, students can

do well by being guided by the teachers and practices in examination questions before the assessment so not much independent learning is needed. As they move up to Pre-university level, students need to demonstrate perceptive, logical, and critical interpretation of information to achieve good academic performance in the Accounting and Economics subjects. Li, Chen, and Duanmu (2010) explained that some Chinese students tend to be very passive in group discussions or debates in class and do not like to raise or answer questions. In addition, the deficiencies in the English language become an obstacle when they need to comprehend learning materials written in English at Pre-university level. Even though previous research (Ku, 1998; Peow, 2013) reports that Chinese students first need to endure the hardship of learning Chinese (see Ku, 1998), nevertheless, this painful experience may not have helped them to perform well at Pre-university level.

Besides, there being no conclusive evidence that using English as a medium of instruction in secondary school has an effect on Pre-university-level Accounting or Economics or both, thus, rejecting H2a, it does not support Chin and Lim (2014), Abe et al. (2014). Most Malaysians learn English as their second or third language, and language anxiety is a feature associated with learning this foreign language (Tran, 2012). Darmi and Albion (2014) have explained that learners who feel positive throughout the language learning process will participate actively in the classroom and be engaged in the learning activities. This, as a result, leads to better achievement in language learning and successful language acquisition. In contrast, learners who have a negative attitude toward learning the target language are prone to be uneasy, suffer from self-doubt, frustration, and worry, resulting in poor performance in language learning. Kamarulzaman, Ibrahim, Yunus, and Mohd Ishak (2013) found that, in Malaysia, even the gifted learners have a certain level of language anxiety in an English language setting; this language anxiety negatively correlates with gifted learners' English language performance. Inappropriate pedagogical approach or unsuitable English language environment in Malaysia can have a devastating effect on anxiety in their achievement (Kamarulzaman et al., 2013). The lack of language proficiency means students do not have the fundamental skills needed to participate effectively in class discussions and perform note-taking two important skills that facilitate academic development (Chin & Lim, 2014).

Students who graduate from international schools show significant negative relationship with Pre-university-level Accounting or Economics or both, thus, resulting in an acceptance of H1. However, there is insufficient evidence to prove that graduating from national schools (significance of 0.525) or graduating from Chinese independent schools (significance of 0.226) has any impact on Pre-university-level Accounting or Economics or both. Hence, the results support findings by Usaini and Abu Bakar (2015) and Hussain et al. (2012) but do not corroborate findings by Eamon (2005) and Crosnoe et al. (2004).

The Malay Mail Online (2014) reported that many parents are paying up to RM 100,000 each year (or RM 8333 each month) to send their children to international schools. The Department of Statistics, Malaysia, has calculated that the Malaysian households' mean income is RM 6141 in 2014. Those parents who can afford to

send their children to international schools are presumed to be from high-income group. These parents feel that their children who have been to international schools tend to have more well-rounded personalities and exposure to the world, although a child's personality may have been shaped not only within the school's environment but through friends, their home surroundings, and other external factors (Malaysian Digest, 2015). For example, as much as it is believed that the excellent cognitive development of children can be formed by a stimulating home environment (Fucci & Cavaletto, 2012; Gibbons, 2009), family culture is also able to influence children's academic achievement (Fucci & Cavaletto, 2012; Wang & Degol, 2013).

Compared to those from rich and affluent family background, Williams (2010) explained, middle-class parents tend to be more involved in their children's education, for example, by way of reading to their children or attending meetings with teachers. Such parents' attitude helps middle-class children achieve good academic results. Parent involvement is important for children's learning, attitudes about school, and future goals (Timkey, 2015). Kim (2009) found that the provision of literacy experiences within the home (i.e., home reading and parent teaching) by parents was related to children's achievement in literacy skills at the end of the study. Okado, Bierman, and Welsh (2014) found that even students from low-income families with low literacy skills are more ready to learn if their parents have a positive attitude and behavior related to learning activities, and the frequency of parent–child conversation at home is high. This study suggests that without parents' positive beliefs, attitudes, involvement in literacy learning and other factors, sending the children to international schools with good physical environment may not guarantee good academic performance.

Students graduating from national schools exhibit no significant effects on academic performance at Pre-university-level Accounting or Economics or both. Thien and Ong (2015) explained that Malaysian students who study in national schools undergo higher levels of anxiety compared to their peers in neighboring countries like Singapore. For example, since 2002, Malaysian governance has required national schools to use the English language in the teaching of mathematics and science, but the medium of instruction was changed back to the Malay language in 2012. This language change caused mathematics anxiety among the students, as shown in the declining performance in both subjects in the Trends in International Mathematics and Science Study (TIMSS) 2011. In addition, Malaysia also experiences low achievement in international assessments. The Programme for International Student Assessment (PISA 2012) which measures 15-year-old students' mathematics, science and reading literacy reported that Malaysian students scored below the Organisation for Economic Co-operation and Development (OECD) average. Among the 65 countries who participated, Malaysian students ranked 52. Besides, Malaysian students were found to have lower levels of mathematics self-efficacy and have higher levels of mathematics anxiety than the OECD average. The theoretical complexity and problem-solving demands of mathematics require rational, interpretative, and strategic skills of students (Schaap & Luwes, 2013), but Malaysian students from national schools with low achievement in mathematics may not have acquired the requisite rational, interpretative, and

strategic skills to help them achieve high academic performance at Pre-university level.

At significance value of 0.226, there is inadequate evidence to show that graduating from Chinese independent high schools has had an impact on their performance at Pre-university-level Accounting or Economics or both. According to the United Chinese School Committees Association of Malaysia (UCSCAM), in Malaysia, such high schools provide secondary education in the Chinese language as a continuation of the primary education in Chinese national-type primary schools. The medium of instruction in these schools is Mandarin with simplified Chinese—character writing. Students need to sit for Unified Examination Certificate (UEC) which is available at three levels: Junior Middle, Vocational, and Senior Middle. Examinations for non-language subjects in the UEC Junior Middle and Vocational are in Chinese. Since the UEC is not recognized by the Malaysian government for entry into tertiary courses, in order to provide opportunities for the students to get government-recognized certificates, some Chinese independent high schools also teach the national secondary school curriculum (in Malay) together with the independent school curriculum (in Chinese) and require students to sit for the government standardized tests (PMR, SPM, or even STPM) as private school candidates. To complete that syllabus and prepare for the UEC and government standardized tests, students are burdened with a lot of homework and also the need to attend lesson for extra-long hours. In Malaysia, homework assigned to students is concerned more with assessing their knowledge and understanding, rather than higher-order thinking skills and creativity (Chew, Teong, & Ishak, 2012). Excessive homework can have a detrimental effect on students as they devote less time to play and relax (Entin, 2011), resulting in frustration and exhaustion (Kohn, 2007), possible loss of interest in learning (Kohn, 2007), and even a negative impact on the relationship between students and their parents at home (Kohn, 2007). As a result, the students from Chinese schools do not necessarily outperform all others in examinations. This is proven in a study by Chew (2012) who compared the overall literacy rate among Malaysian secondary school students. The researcher found that the mean scores of Malay students at the basic and critical levels were higher than the mean scores of Chinese students. Chinese students are burdened with excessive homework, long lesson time, and being passive in class discussions (Li et al., 2010), and thus, they may not possess perceptive, logical, and critical interpretative skills to cope well at Pre-university-level Accounting or Economics.

16.4 Conclusion

The purpose of this study is to establish the relationship between types of school, medium of instruction, and academic performance of business studies students at Pre-university. From the analysis, students who use Malay as the medium of instruction perform worse than their peers in Pre-university Accounting or Economics or both. Since Pre-university-level Accounting or Economics students

need to communicate effectively in the English language, most Malay language learners in Malaysia are either learning English as their second or third language, and lacking in linguistics knowledge, hence, they are weak in comprehension performance and overall academic performance (Mohd Zin & Rafik-Galea, 2010). This prompts the need for researchers, policy makers, educators, and language teachers to look into ways to design effective syllabi and assessment criteria to improve students' linguistic knowledge. Also, this study shows that students attending international schools do not necessarily achieve good results at Pre-university Accounting or Economics or both. Parents sending the children to international schools may need to consider other factors such as positive self-belief, attitude, and their involvement in literacy learning to contribute to their children's good academic performance.

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Chapter 17
Rasch Model Approach to Analyze Quality of Preservice Teachers' Teaching Behavior to Pedagogy Content Knowledge

Rayendra Wahyu Bachtiar

Abstract Pedagogy content knowledge (PCK) skills of preservice teacher play a major role in academic career. To date, commonly an institution program for enhancing PCK of preservice teachers is conducted as the course program called Teaching Practice Learning (PPL). Academic achievement of its program shows that preservice teachers got a good value. Nevertheless, few studies are able to show how PCK skills can be constructed by teaching behavior. The present study purposes to analyze how teaching behavior of the preservice teachers conducting teaching practice can construct their PCK ability. Rasch approach was used to predict the construction. The theoretical framework of PCK is based on Shulman theory and empirical studies of effective teaching. Besides, teaching behavior was adopted from previous research (Grift, 2007; Maulana & Helms-Lorenz, 2016). The result revealed that teaching behavior in the authentic environment can affect for PCK skills. Furthermore, there was a different issue of the pedagogy skills constructed by the behavior of stimulating environment among others. So, the future research suggestion in educational issues was discussed.

Keywords Pedagogic Content Knowledge · Preservice teacher · Teaching behavior · Rasch model

17.1 Introduction

Developing teacher competence quality has been the primary focus of educational policy across many parts of the world in the last decade (Birenbaum et al., 2015; DeLuca, LaPointe-McEwan, & Luhanga, 2015). The educational policy of teachers competency was made to accommodate the legality of the work program. At the same time, the researchers focusing educational research have shown the results of their study which can describe the condition of the ability of teachers (Cheng, 2014;

R.W. Bachtiar (✉)
Jember University, Jember, Indonesia
e-mail: rayendra_fkip@unej.ac.id

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Jiang, Ma, & Gao, 2016; Nevgi & Löfström, 2015; Tang, Wong, & Cheng, 2016). However, very few researchers were able to reveal that the quality of teacher skills is caused by the sustainability educational policy.

The focus of researchers in the field of education was on the study of learning design proposals considered in accordance with the conditions of students (Daniels, Poth, Papile, & Hutchison, 2014; Tang et al., 2016; Taşoğlu & Bakaç, 2014). Results of these study showed that a few instructional designs were appropriate with the content of teaching materials. Moreover, there have been yet study done in-depth study analyses to the quality of teaching teachers on implementing the learning in the classroom, which is why the improvement of curriculum policy only focuses on modification in the administrative structure.

Behavior of teachers in teaching is the main indicator that can be used as a picture of the quality of learning in the classroom. The study showed that the teaching behavior is the main predictor of the student's learning outcomes including motivation, learning outcomes, and the involvement of student learning (Nemeržitski, Loogma, Heinla, & Eisenschmidt, 2013; Vries, Jansen, Helms-Lorenz, & Grift, 2015). An activity of teachers' teaching is known as an effective factor in improving the quality of teaching (Arsal, 2014; Nivalainen, Asikainen, & Hirvonen, 2013). Thus, the behavior of teachers in teaching plays an important role in deciding upon the success of students' learning.

Pedagogical competence can be used to indicate the quality of teachers in the learning activity (Alonzo, Kobarg, & Seidel, 2012; Aydeniz & Kirbulut, 2014); in this case, it is the quality of teachers' teaching behavior. Pedagogic skills are a major component needed by teachers implementing the learning in the classroom. The indication of teachers having its abilities was ability of teacher constructing learning materials in line with the characteristics of students (Aydeniz & Kirbulut, 2014). In consequence, if the teacher is able to design learning strategies appropriate to the content of teaching materials, then the teaching behavior are qualified teachers.

The study on the teachers pedagogical competence has still focused on the study how teachers' design learning is (Aydeniz & Kirbulut, 2014; Khakbaz, 2016; Leader-Janssen & Rankin-Erickson, 2013; Oh & Kim, 2013). In fact, besides its competence, one of the important skills required for teachers is the teaching ability to reflect their learning that has been done. The finding of self-evaluation will be able to observe the successful or unsuccessful learning (Alonzo et al., 2012; Aydeniz & Kirbulut, 2014). Thus, the sustainability of the improvement learning process can keep up based on own observation. Consequently, the teachers' teaching behavior must be measured in order to be necessary to reflect the quality of teachers' pedagogical skills of teachers in terms of designing, implementing, and reflecting learning.

A number of studies identifying the teachers' abilities were performed with the classical analytical approach or classical test theory (CTT) (Hegde & Meera, 2012; Mandeville & Stoner, 2015; Ryu & Sandoval, 2015). Although CTT can provide information about the abilities of teachers, the approach has some drawbacks. Moreover, if the results of the analysis of the approach are used for the assessment

for learning, it will be problematic in certain circumstances. A number of studies provide the CTT critics about the limitations of validity and reliability (Jong, Royal, Hodges, & Welder, 2015; Kubinger, Rasch, & Yanagida, 2011; Scott & Schumayer, 2015). So that the analysis in this study using item response theory approach is Rasch model.

17.2 Research Methodology

This study was employed as mixed method design. Qualitative data is obtained to determine teachers' activities. Then, this data was analyzed by Countenance Stake [Stake, 1977 in (Wood, 2001)] to show the construction of the pedagogy skill of teachers. Rasch model is used to examine teachers' teaching behavior. The result of Rasch model analysis will be able to capture pedagogical content knowledge of teacher.

The participants in this study were 10 teachers conducting to practice teaching course in school. Five teachers firstly practiced in junior high school, and others were on senior high school. The present study was conducted for 3 months. Every end of the week, the data was obtained such as lesson plan, activity of learning, and result of reflection. The end of every week on every month, teaching behavior is acquired.

The teachers' teaching behavior was measured using the observation instrument developed by the International Comparative Analysis of Learning and Teaching (ICALT) (Grift, 2007; Maulana & Helms-Lorenz, 2016). The instrument consists of 29 items, such as (1) safe and stimulating learning (SL), (2) classroom management (CM), (3) clear instruction (CI), (4) activating learning (AL), (5) adaptation of teaching (AT), and (6) learning strategies (LS).

17.3 Result and Discussion

Table 17.1 states that item reliability is very high (0.97), adequate high reliability of person (0.87), and Cronbach's alpha (0.89). Overall, that data appropriates the Rasch model. According to Table 17.1, we concluded that the item task appropriates with person (student) who has medium ability.

Figure 17.1 states the summary of person and item. There are 4 teachers who have the best ability of teaching behavior (i.e., F01, F08, F10, and F12). It indicates

Table 17.1 Summary statistic

No	Description of reliability	Score of Rasch analysis
1	Person	0.87
2	Item	0.97
3	Cronbach's alpha	0.89

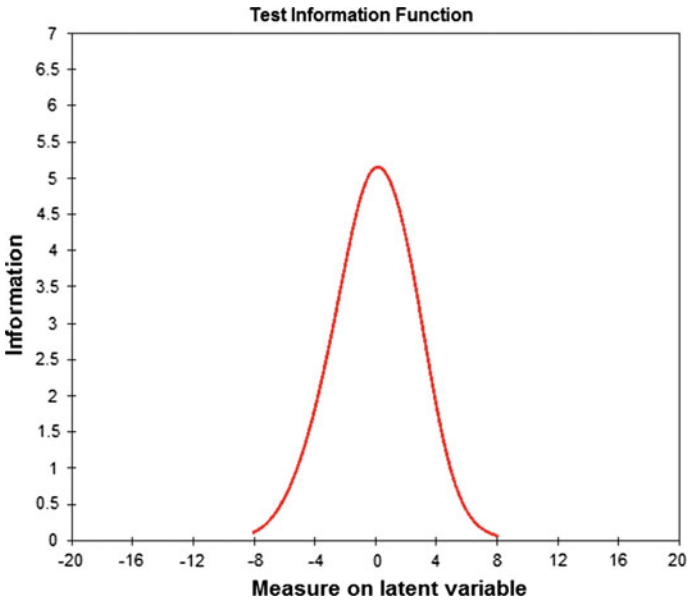

Fig. 17.1 Information function of the item (CPS)

that teachers have strong pedagogy content knowledge skill. In contrast, there are 2 teachers who have lowest teaching behavior ability. That teacher had good content knowledge, but pedagogical knowledge was very low. They were not able to construct the comfortably learning environment for their students.

Figure 17.2 states that there are many teachers having the same ability. Nevertheless, there are few students having negative ability. Finding of misfit-order person stated that 7 teachers were not fit. The large outfit can be caused by careless mistakes or lucky guessing of a small number of participants. Only 3 teachers were fit of measured Fig. 17.3.

Countenance analysis is used for the teaching behavior of teachers. Table 17.2 presents the matrix congruence analysis.

Based on the data, Table 17.2 reveals that the teaching behavior of teacher is still low. It means that the teacher had minimum skill of pedagogic knowledge. It appears when the teacher prepared the lesson plan. The result of analyzing the lesson plan states that the aims of learning did not appropriate with learning activity. Furthermore, the process of learning had been disorganized. Some research also showed similar results, and the quality of learning process is caused by the lesson plan which is well prepared (Alonzo et al., 2012). Although teacher has a good knowledge mastering content, he still needs to know about knowledge of teaching (Aydeniz & Kirbulut, 2014).

The results of the transactions analysis showed that most teachers have the ability to manage learning in the classroom. This is shown in Table 17.2 that the teacher is able to manage time (CI), invites students to engage actively in class

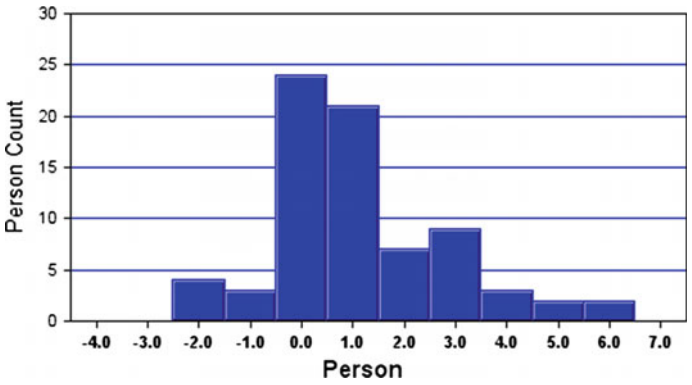

Fig. 17.2 CPS student histogram

(AL), and is able to explain clearly the learning materials. This suggests that the pedagogical skills of teachers can be formed when the teacher can manage learning materials in accordance with the state of the class (Alonzo et al., 2012; Leader-Janssen & Rankin-Erickson, 2013). Nonetheless, there is still little lower ability of teachers in terms of the ability to stimulate students to solve complex problems (LS). Teachers still often provided the solution directly when students are not able to solve their complex problems. Previous research suggests that the developing students' problem-solving skills required teachers' guiding (Aydeniz & Kirbulut, 2014; Khakbaz, 2016). Furthermore, the students will be used to solve the problem by their ability when he faced with another problem situation (Stadler, Becker, Greiff, & Spinath, 2016; Toplak, West, & Stanovich, 2014).

Transaction analysis results show that most teachers did not have the ability to self-evaluation. The learning process, teachers had not been able to stimulate the students to use the ability initiation in troubleshooting solutions (CI). Likewise, when the students discovered a complex issue, students is always reliance by the problem solution from teacher. At the final stage of the learning cycle, researchers and participants (teachers) conducted a self-evaluation about cause of weakness of problem-solving abilities. Teachers had trouble to explain cause of the problem. In the process of learning, the teacher was able to see why it could be happen. This indicates that the ability of the teacher's pedagogical aspects in metacognition is low. The past studies showed that teachers must have pedagogical metacognition ability to make qualified learning planning (Jiang et al., 2016). In addition, the ability of the teachers to analyze the ongoing problems in the classroom is required to be owned (Davidowitz & Potgieter, 2016; Karal & Alev, 2016; Oh & Kim, 2013). It is often found that teachers do not have the awareness of students having a problem actually. Consequently, It is necessary to conduct further research in seeing how the teachers' consciousness responds the problems of students, and further research will be termed as a pedagogical awareness.

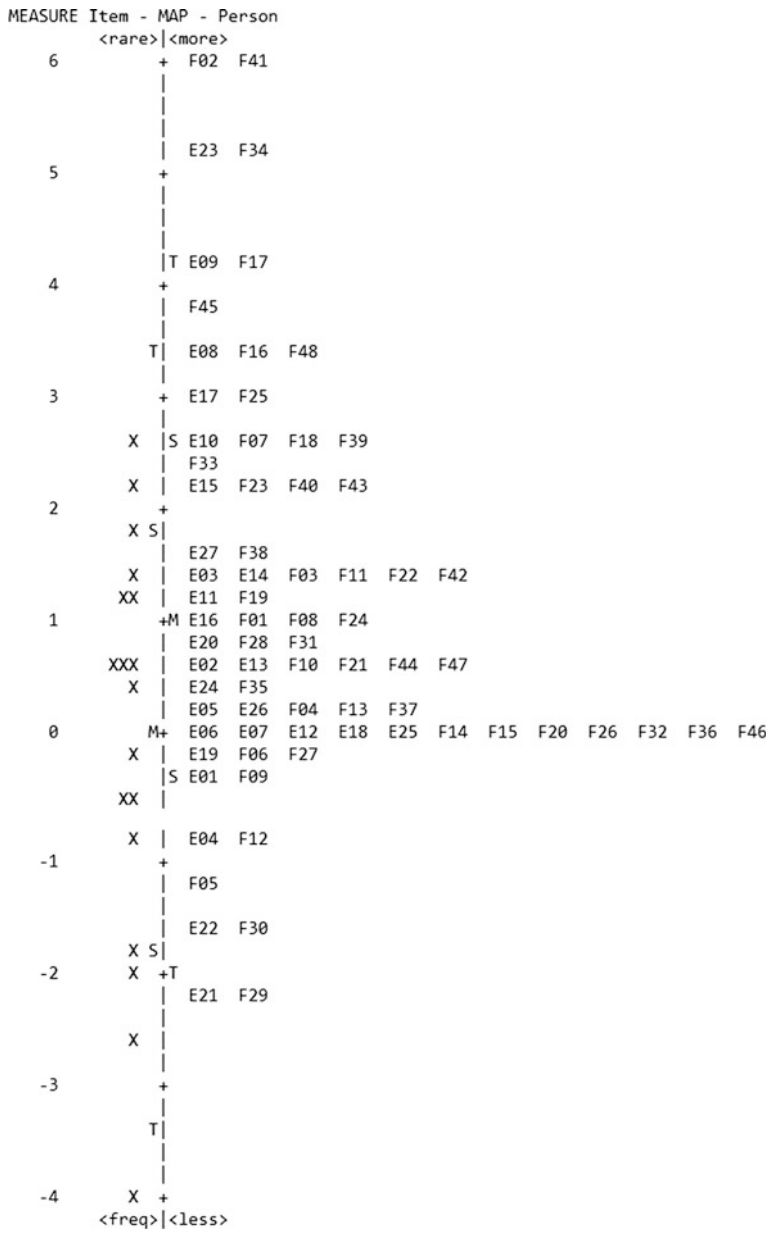

Fig. 17.3 Summary of item response

Table 17.2 Congruence analysis

Description matrix		Judgment Matrix	
Items	Observation	Standard	Judgment
Antecedent Teacher in groups planning to resolve the problems that have been granted	Observation results show there are 4 teachers having the ability average in SL CM, CI, and LS. In addition, 6 teachers of CI, AL, and AT got the average value of 3	Teaching behavior on pedagogic content knowledge	Most of the teachers have the skills of teaching behavior on elements of clear instruction. However, an element of CM and AI was still low. It showed that the teachers still need to improve their learning activity
Transaction Teacher in groups implements to adapt to the problem-solving process that has been planned	Observations show that there are 6 teachers having enough ability of CI. While the average AL has an average value of 3	Teaching behavior on pedagogic content knowledge	Most of the teachers still reached the teaching behavior on below of average. In addition, the observation showed that most of the teachers having AL are below average
Outcomes Teachers can solve the problems given in the learning	Only 3 teachers are successfully solved the problem, while the results of the observation on LS got the average value of 4	The whole group can solve the problems according to the indicator results for all teaching behavior of 3	Most of the teachers still have low teaching behavior, especially LS so that the results of students' achievement cannot be optimal and most of them cannot be completed on time although the observation revealed generally positive motivation of teacher on SL

17.4 Conclusion and Future Study

Based on the findings, it can be concluded that the teachers' teaching behavior has been able to demonstrate the quality of pedagogical content knowledge skill significantly. Nevertheless, increasing skills in terms of constructing students' own problem solving need to study anymore. In addition, further research needs to be done about the awareness of teachers in response to the problems faced by students during the learning process. Likewise, the development of skills is necessary to study of pedagogical awareness.

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Part III
Technology as Best Practices in Teaching and Learning

Chapter 18
Interactive and Engaging Module Sites: The RASA Model

Wong Yau Hsiung

Abstract E-learning has emerged as one of the fastest moving trends in today's education. In Taylor's University, Taylor's Integrated Moodle e-Learning System (TIMeS) is the learning management system (LMS) that instructor uses to deliver and manage learning course content. In this platform, an innovative model known as R.A.S.A model was introduced. The content in TIMeS is framed into four parts for easy navigation: R.A.S.A. (Resources, Activities, Supports, and Assessments). The resources part provides the students with multiple learning resources. These resources are visually engaging and contain high level of interactivity. This motivates the students and promotes learning. The e-Learning is designed in both facilitated and self-paced activities. This means that the students can learn it at anytime and anywhere. The simulation and scenario-based activities create a learning environment that "simulates" the real world. This engages the student's intellect and imagination, allowing them to learn by doing. The game-based activities create a fun and motivating experience and enable students to construct knowledge by playing. The e-Learning activities are supported by synchronous and asynchronous communication tools. Students can use discussion forum, online discussion board, and social apps such as Facebook to comment, reflect, socialize, and exchange ideas. This facilitates collaboration and knowledge-sharing among students. For assessment, a variety of student response systems (SRS) are used to provide real-time feedback. A student survey was conducted to investigate the effectiveness of this model. Results showed high level of student engagement and improvement in learning after implementation of R.A.S.A model in module site. The module site won the "Oscars" for TIMeS Awards in 2015 as the most active module site in Taylor's University. In summary, the design of RASA and the integration of technologies in this module site could serve as a target for future massive open online course (MOOC).

Keywords Moodle · Interactive · Module site

W.Y. Hsiung (✉)
Taylor's University Lakeside Campus, Subang Jaya, Malaysia
e-mail: YauHsiung.Wong@taylors.edu.my

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18.1 Introduction

In recent years, many studies have shown that e-Learning enhances learning among students. As e-Learning starts to gain popularity, consideration needs to be given to the delivery system to be used and the instructors. All institutions of higher education in Malaysia are using one form of e-Learning tool or another. The most common tool that all major institutions have is a learning management system (LMS), namely Moodle or Blackboard. LMS is used to disseminate learning content, assessment, and communication via posting and announcements. In Taylor's University, Taylor's Integrated Moodle e-Learning System (TIMeS) is adopted by all lecturers for these purposes. Nowadays, students are often characterized as digitally literate, socially connected, experiential, independent, and valuing collaboration. They learn on things that are meaningful for them, they learn by doing and experience it, and they like to share and collaborate with others. Instructor must effectively tap on students' existing familiarity with technology to engage them in learning to become a lifelong learner. To do this, innovative and engaging module site is important to facilitate the students in achieving academic excellence. This shifts the paradigm from teacher-centered to learner-centered. Besides traditional roles as lecturer and advisor, instructor must now able to utilize innovative technologies.

18.2 Methodology

The R.A.S.A. model is implemented in Taylor's Integrated Moodle e-Learning System (TIMeS). Two module sites, General Chemistry I (CHEM 105) and Precalculus (MATH150), are developed according to the R.A.S.A. model. R.A.S.A. stands for Resources, Activities, Supports, and Assessments. This model was initiated and integrated into the two module sites. These two courses are offered to first-year undergraduate students in American Degree Program (ADP), School of Liberal Art and Sciences, Taylor's University. These modules are implemented using blended-learning approach. Therefore, students are required to bring their own device (BYOD) to class (laptop, tablet, or smartphone). Besides face-to-face teacher–student experiences, online e-Learning practices are used to amplify the pedagogy (Fig. 18.1).

TIMeS is a mobile-learning platform. It is easily accessed anywhere and anytime on a laptop, tablet, or mobile phone that connected to Internet. This means that students can access all the materials in this module easily and learn at their own pace (self-directed learning). The module site is organized into chapters for easy navigation. Each chapter is spilt into four parts: Resources, Activities, Supports, and Assessments. Students will be assessed at the end of chapter by multiple assessments. This bite-sized learning enables students to reflect more quickly on the learning process and hence enhance their learning effectiveness. This model aims to

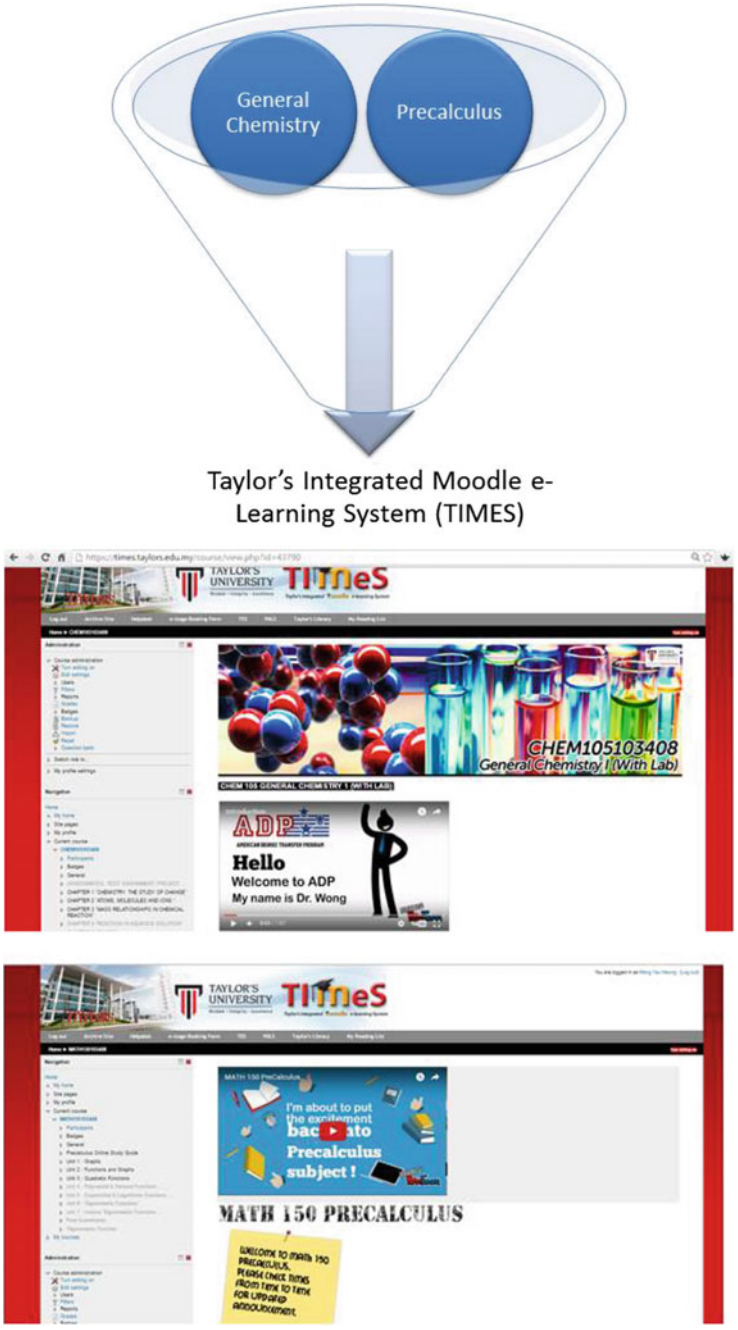

Fig. 18.1 Module sites: General chemistry I (CHEM 105) and precalculus (MATH150)

provide 3E learning (effective, efficient, engaging learning), which comprise of the following seven elements: (1) visually engaging learning content, (2) storytelling, (3) interactive lesson, (4) game-based learning, (5) real-life scenario problem solving, (6) social interaction, and (7) collaboration (Figs. 18.2 and 18.3).

Before the face-to-face lecturing of the chapter, the students are required to explore the online resources in TIMeS, such as interactive online lesson, video, and simulation. This includes the attempt of a pre-class quiz or assignment. This helps them to recap their prior knowledge. The results will be reviewed, and this helps instructor to plan teaching strategies by focusing more on knowledge and skills gaps. This approach has several advantages. It forces students to come prepared to the classroom, allows the design of more efficient classroom activities which are tailored to the specific needs of students, and reduces the total time in classroom, which reduces costs.

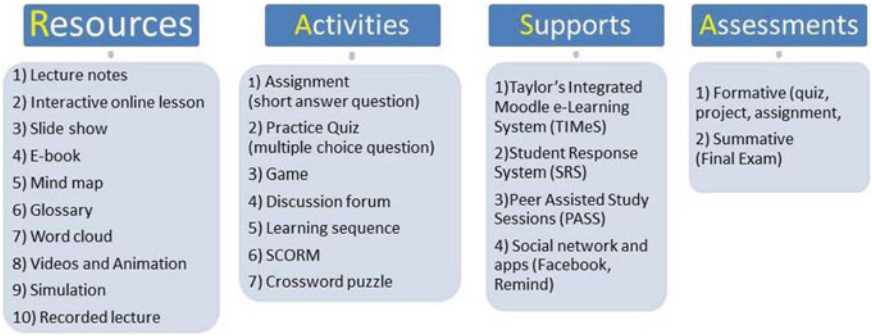

Fig. 18.2 *R.A.S.A.* (resources, activities, supports, and assessments) model

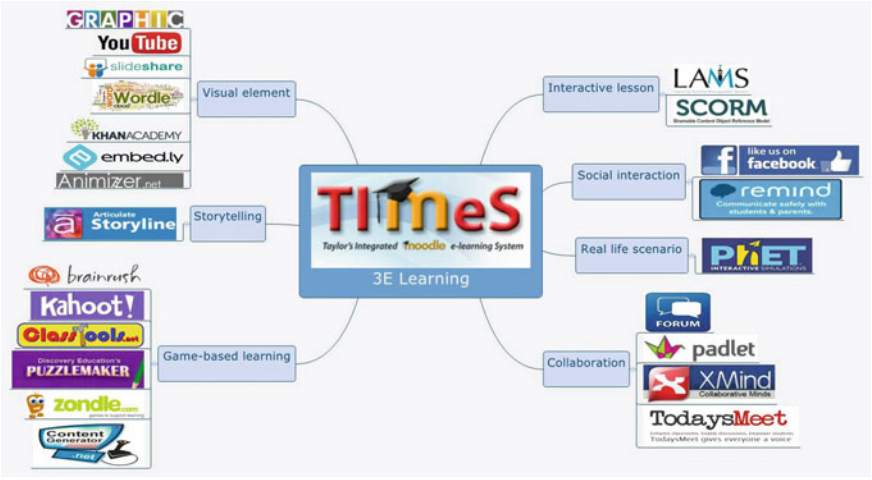

Fig. 18.3 3E learning (effective, efficient, engaging learning) using the R.A.S.A. model

During lecture, several visual presentations are used in delivering the lesson. This includes PowerPoint, Prezi, and Nearpod. A student response system (SRS), known as Poll-Everywhere, is inserted into the PowerPoint slides to generate poll questions and gather students' feedback. Besides Poll-Everywhere, other SRS such as Kahoot, Socrative, Padlet is also used in class for student discussion and feedback. After the lecture, the students are required to attempt all the online activities in TIMeS, such as assignment, quiz, mind mapping, and forum. The students have to construct a mind map of the chapter using "X-minds." Mind mapping helps students to express and relate the chemistry concepts visually through images and pictures. This helps students reflect what they have learned in class. Help and support such as peer tutoring are there for continuous reinforcement. The learning process will be evaluated by assessments (formative and summative) that are aligned with the learning objectives. In this model, students' progress is assessed at three stages: before each chapter starts, at a certain point in the chapter (with the use of SRS during F2F class), and after the completion of the chapter. This ensures that the students achieve the intended learning outcomes (Fig. 18.4).

In these modules, the content is visually designed to get the students' attention and attract their interest. A variety of e-resources and activities are designed using TIMeS. This includes interactive study guide, slideshow, LAMS lesson, SCORM, recorded lesson, worked examples, forum, online assignment, QR code, online quiz, video (PowToon, YouTube, and Khan academy), mind map, animation, and simulation. These online activities consist of questions associated with response and feedback. The question formats used include true false, multiple choice, multiple responses, matching, ordering, fill in the blank, and short answer. Visually powerful Web calculators, graphing utilities, and search engine such as Wolfram Alpha and Mathway provide step-by-step solution for a particular problem.

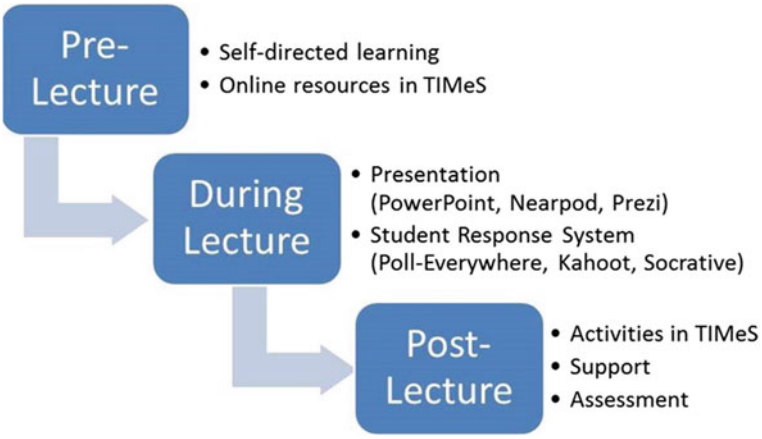

Fig. 18.4 Implementation of R.A.S.A. model in pre-, during, and post-lecture

Experiential learning such as interaction lesson, simulation, virtual lab, scenario, and game-based activities engages student's intellect and imagination to foster deep understanding. The simulation creates a scenario where the students have to use the information that they have just learned in order to solve a problem. This will help them to adapt the information to real-life scenarios, while also reinforcing what they have already learned.

For formative assessment, a variety of student response systems (SRS) are used to check the level of understanding among the students. These technologies are easy to use and the users only need to download the apps on mobile device and connect to Wi-fi. They engage the students and provide real-time assessment. Forum, Padlet, and Todays Meet are used to promote collaborative discussion among students. These tools encourage the student to discuss and share ideas to solve the problem. Teacher–student communication is possible with the use of Remind apps and the message function in TIMeS and Facebook. Technology such as augmented reality (AR) is also used to illustrate the 3D structure of molecule by using the ipad apps known as "Aurasma."

18.3 Result and Discussion

A survey was carried out on the students. These figures show some of the research findings conducted on the use of various student response system (SRS) in these modules. Figure 18.5 showed that Kahoot is the students most favorite SRS (Fig. 18.6).

The use of Kahoot showed significant improvement in student learning as further studies shown that Kahoot is fun, engaging, and competitive. It enables active learning, helps students to identify problem areas, and provides feedback to students. Figure 18.7 showed that student scored better after implementation of the R. A.S.A model in the module sites.

The design of RASA (Resource, Activities, Support, and Assessment) and the integration of technologies in this module site could serve as a target for future massive open online course (MOOC). This module also demonstrates how to leverage cutting-edge technologies to create innovative learning environment in a

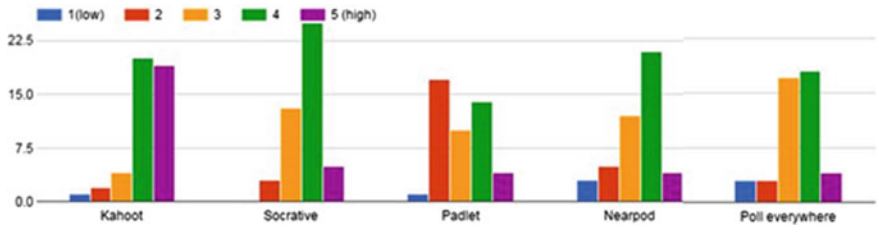

Fig. 18.5 Impact of different student response system (*SRS*) on your learning

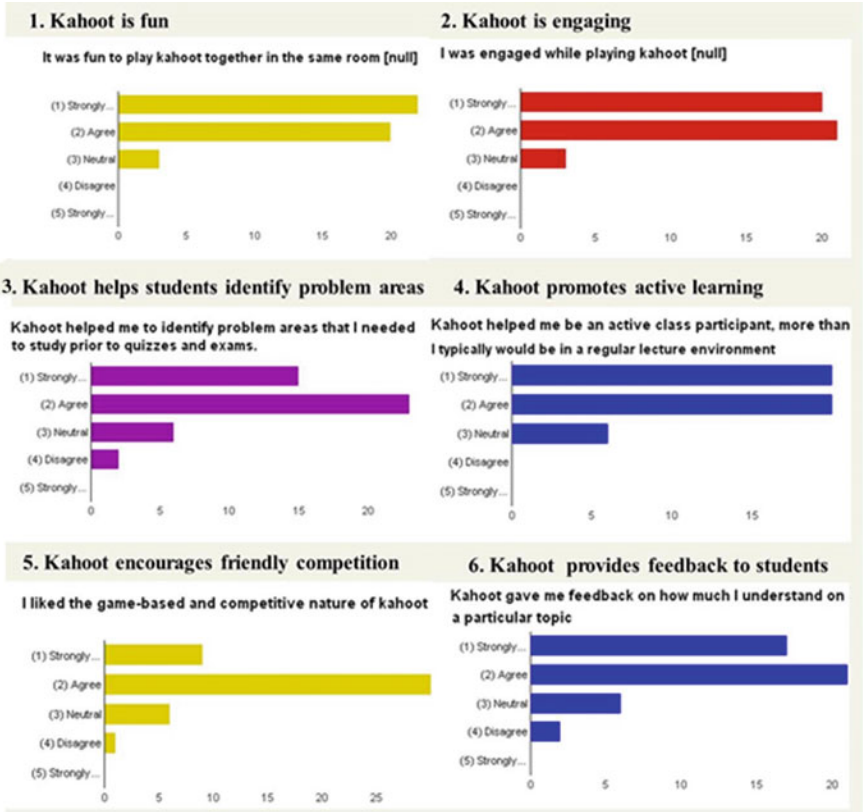

Fig. 18.6 Effects of Kahoot on students

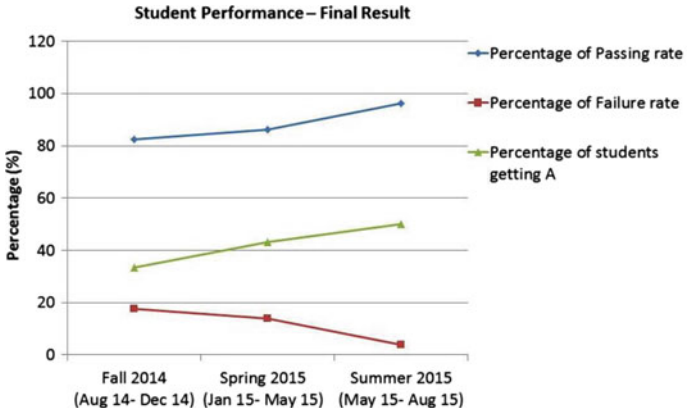

Fig. 18.7 Impact of different student response system (*SRS*) on your learning

"dry" Chemistry subject. For example, the use of interactive game-based learning and engaging student response system (SRS) could transform traditional teaching methods in subject such as Chemistry. Other practices that used in the module, such as flipped classrooms and blended learning, also serve as potential bench marker for effective and creative e-Learning.

In line with the Taylor's Graduate Capabilities, this module helps the students to achieve the capabilities of lifelong learning, thinking and problem-solving skills, and digital literacy. Furthermore, this module also in line with the e-Learning mission of Taylor's University, which is by 2016, every student at Taylor's University will learn in a collaborative, self-directed and personalized manner anytime anywhere.

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Chapter 19
A Semantic-Based Document Checker

Jer Lang Hong

Abstract Current document checker tools rely on the keywords statistics as well as its neighboring words for document similarity. It also assumed that the database of the documents to compare to is large enough for sufficient checking. However, these tools failed to detect words which are nearly similar in content, even they are synonymous. In this paper, we developed a tool to detect document similarity based on its semantic contents, not word matching. Experimental results show that our tool is highly effective for document detection on a pool of documents.

Keywords Social networking · Twitter · E-Learning

19.1 Introduction

A paper publication goes through a series of reviews which use peer review system whereby the paper is vetted and undergoes revision where necessary. If the paper is deemed suitable for publication in the said publication venue, the paper will then be typeset and converted accordingly to the format prepared by the publisher. However, a paper which is well written may be a result of duplicative work of another work published elsewhere. With the advancement of Internet technologies and the wide access of digital document and tools, it is certainly feasible and in fact easy to reproduce a person's work without much effort. Fortunately, current online plagiarism tools are able to check plagiarism using state-of-the-art detection algo-

J.L. Hong (✉)
Evault Technologies, San Francisco, USA
e-mail: davidhong@evault.com.my

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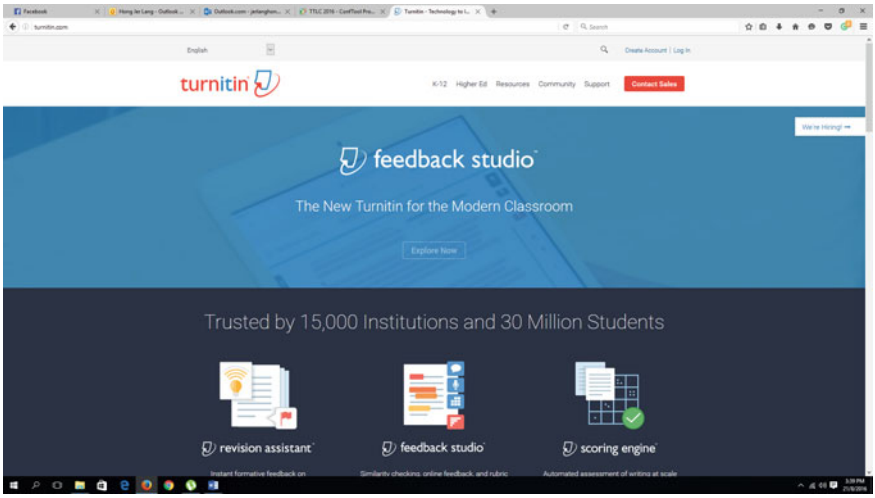

Fig. 19.1 Turnitin plagiarism checker

rithms and the powerful processing of parallel servers as well as the wide availability of online databases.[1,2,3,4,5,6]

These tools are efficient and with high accuracy, but they are not without problems and defects. One of the major limitations of these tools is their unability to detect words which are similar in meaning. Most of these tools detect the words by matching the individual words as well as their neighboring words. Fortunately, with the advancement in research and the recent development of semantic technologies, it is now possible to detect and match words which are similar in meaning (Figs. 19.1, 19.2, 19.3 and 19.4).

In this paper, we propose a novel semantic-based plagiarism checker which utilizes semantic keyword matching using lexical database WordNet. WordNet is a free lexical database available online with terms for over 110 million of words available in English language. We use a plug-into connect to the vast words available in WordNet and then perform keyword matching using semantic checking. Once the words are matched semantically, we further match their neighboring words to increase the matching accuracy further.

[1] http://turnitin.com/

[2] http://www.ithenticate.com/

[3] https://www.grammarly.com/plagiarism?q=plagiarism&utm_source=google&utm_medium=cpc&utm_campaign=Search&utm_content=56705347446&utm_term=plagiarism%20checker&matchtype=e&placement=&network=g&gclid=COL98qP_0c4CFdeFaAodvrYFAg

[4] https://www.plagramme.com/?gclid=CIKJhqv_0c4CFRUeaAodAZ0N6w

[5] http://en.writecheck.com/

[6] http://smallseotools.com/plagiarism-checker/

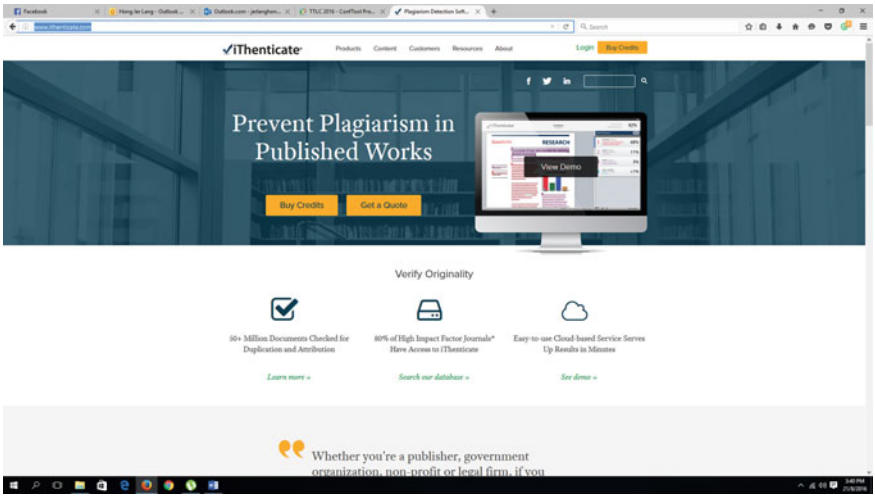

Fig. 19.2 Ithenticate plagiarism checker

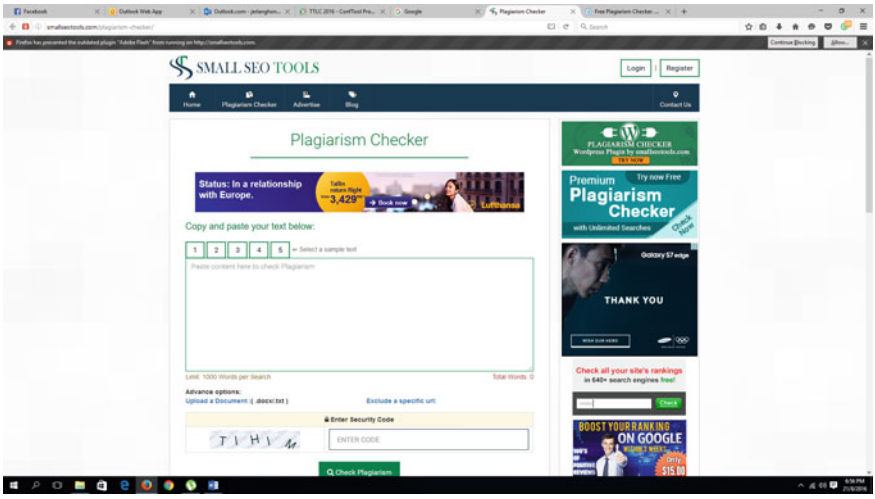

Fig. 19.3 Small SEO

The paper is divided into several sections. The next section describes research related to ours, while the subsequent section explains the methodology in detail. Then, we present our experimental results and finally we conclude our work.

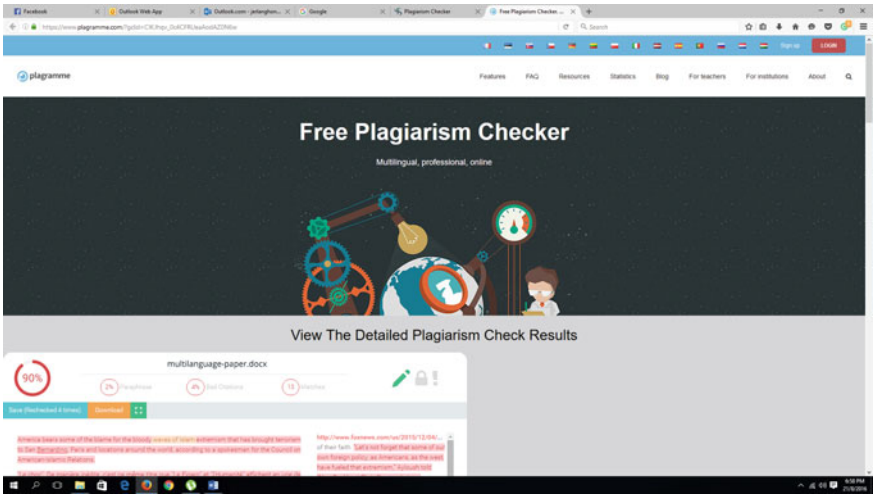

Fig. 19.4 Free plagiarism checker

19.2 Related Work

19.2.1 Overview

In this chapter, we present an overview of semantic-based tools and provide a comprehensive review on these tools. The literature survey in this section is taken from the paper published in (Hong, 2013).

19.2.2 WordNet

WordNet (Fellbaum, 1998) was developed in 1998 as a lexical database for English for the semantic matching of words in Information Retrieval research. Its database consists of 150,000 words organized in over 115,000 synsets for a total of 207,000 word-sense pairs. WordNet is able to represent nouns, adverbs, verbs, and adjectives as a group of cognitive synonyms (synsets) with their own distinct concepts. Synsets are linked by means of conceptual semantic and lexical relations. WordNet provides an intuitive interface for the users to use and navigate the functionalities provided. It categorizes English words into several groups, such as hypernyms, synonyms, and antonyms.

19.2.3 CYC

Lenat developed CYC for MCC Corporation. CYC provides a larger ontology domain for the users with higher level ontology. There are more than hundreds thousands of terms, and millions of assertions related to the terms in CYC. The ontology in CYC knowledge has 47,000 concepts and 306,000 facts browsable by CYC Web interface. A mapping to define the concepts of each term is utilized, where every concept mapped to the terms will return either a true or false statement. Based on this return value, users can then decide the appropriate actions for future processing.

19.2.4 BabelNet

BabelNet (Navigli & Ponzetto, 2010) is an extension of WordNet, where it overcomes several deficiencies in WordNet. WordNet is designed to be a lightweight ontological technique with limiting ontology domain and capability to provide sufficient information to the users. Combining WordNet and Wikipedia, BabelNet integrates the domain and knowledge base of these two systems which could sufficiently provide the users with higher level ontology domain. In addition, BabelNet is also able to distinguish word-sense disambiguation accurately using the information provided by Wikipedia domain knowledge.

19.2.5 YAGO

Yet Another Great Ontology (YAGO) is developed by Fabian, and it is a lightweight ontology with extensible functionalities for high data coverage and accuracy (Suchanek, Kasneci, & Weikum, 2007). An accuracy of 95% is attainable in YAGO for its test cases. Data is extracted from Wikipedia, where it is unified with WordNet, which could provide the users with 1 million entities and 5 million facts. YAGO also includes functionalities such as *IsA* as well as non-taxonomical relations between entities.

19.2.6 WordNet++

An extension of WordNet (WordNet++) is developed to solve word disambiguation problems. It extends the existing WordNet by providing extra high-quality information from Wikipedia. High-quality semantic information to the users is attainable, with support for word disambiguation using the interface of supervised tool word-sense disambiguation (WSD).

19.2.7 Wikitology

Wikitology is an ontology tool developed based on the Wikipedia. It is used as a tool for many NLP problems. Each article is a concept in the ontology. The terms in the article are linked to each other, and they may also interlink to other documents. Wikitology is currently in its content, and consistently maintains the quality of its contents and has broad coverage for its users.

19.3 Proposed Methodology

19.3.1 Overview

Our semantic-based plagiarism checker is divided into two sections (see Fig. 19.5). The first section involves the keyword detection and matching, where the documents are screened through and tokenized into individual keywords for exact matching. The second section uses a novel semantic check, where the words in the documents are parsed through and checked semantically. Once the semantic check is carried out, further checking is performed to solve the word disambiguation. For example, the word "*Interest*" in the sentences "*Interest in book*" and "*Interest in bank*" is having dissimilar meaning though they are identical.

19.3.2 Similarity Detection

To parse through the documents and tokenize them into words, we need document analyzer tool. We use Apache Lucene available at https://lucene.apache.org/core/corenews.html to parse through our documents. It is assumed that the documents are either in Word or PDF format. Once the document is parsed, we tokenize them into individual words. Then, we conduct a thorough search of those documents with respect to the available online databases. Online databases include those published works available, and also the unpublished texts and articles. We use Apache Lucene to parse through the online databases, where similar tokenization process is carried out. We then match the words in the first document to those of the target document. If a match is found, we calculate the similarity index and update it accordingly. Once the first document is fully matched, the final updated similarity is calculated. Then, we perform the matching process with the second document until the last available documents with the same matching process.

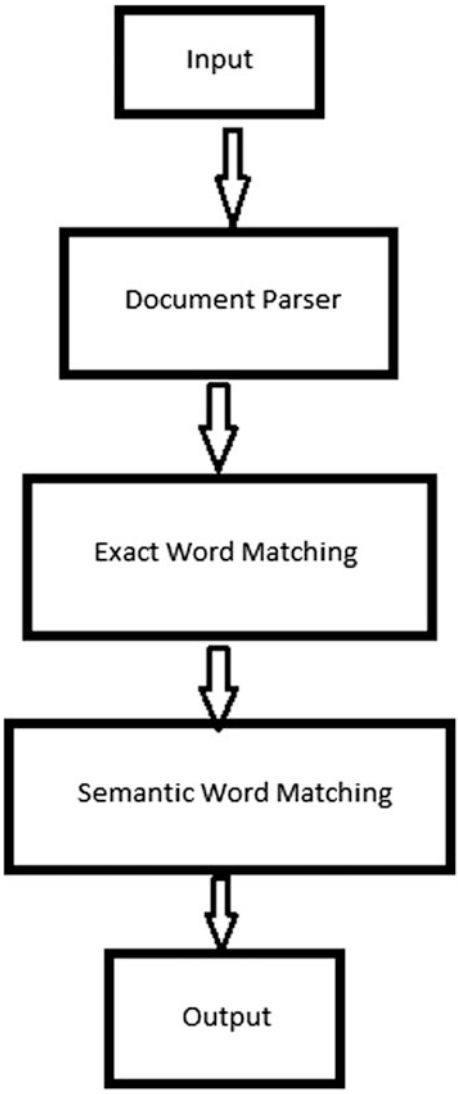

Fig. 19.5 Flowchart of our system

19.3.3 Semantic Checking

To match the word semantically, we use a lexical database for English WordNet, which consists of 110,000 synsets. Several algorithms exist for semantic word matching. We use the algorithm of Jiang and Conrath (1997) as studies in (Budanitsky & Hirst, 2001) show that this algorithm is the most effective among all the existing techniques (Leacock & Martin, 1998). We consider two words as matched if their similarity score exceeds 0.7. We perform the semantic matching

Table 19.1 Results' comparison

	Our tool (%)	Small SEO[a] (%)
Student samples	41.5	35.6
Staff samples	31.5	24.9

[a]see Footnote 6

using the same technique as the exact matching mentioned previously. We remove all the irrelevant words such as punctuation, and stop words before the word matching is carried out. Word stemmer is used to stem every word to their base. In some cases, there is word disambiguation for sentences in the word document. To remove word disambiguation, we use Adapted Lesk algorithm (Banerjee, 2003), where neighboring words in the sentences are matched and compared to determine the semantic similarity of the sentences. Once the semantic checking is carried out, we calculate the similarity score for the document analyzed.

19.4 Experiments

We conduct our experiment by taking 50 samples from student's coursework and staff publications (25 samples each). Samples are chosen randomly and taken from different faculties and schools. For each documents analyzed, we calculate the similarity score and compare it with state-of-the-art plagiarism tool (see Footnote 6).

Table 19.1 shows the results' comparison between our tool and Small SEO (see Footnote 6). As shown in the table, our tool is able to detect a higher level of plagiarism in the students and staff works. Most of the additional level of accuracy of the tool lies in the detection of word paraphrasing, where sentences are rephrased into another sentence by the author. However, for some cases, our tool over-analyzes the detection, where it incorrectly identifies the matching.

19.5 Conclusion

We propose and develop a novel semantic-based checker, where words are identified and matched semantically. Experimental results show that our proposed method is more accurate than conventional plagiarism detection tools which use exact word matching. We believe that this tool is crucial in the development of future plagiarism detection tools utilizing ontologies and parallel processing power.

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Chapter 20
Technology Innovation in Dairy Farm Management

Devi Ponnu

Abstract The Farm Tourism Event project is based on a larger CSR project entitled, "Scaling-up Dairy Farmers of Malaysia from Low Yield to High Yield Income via Capacity Building: Proposed Dairy Farm Tourism & Application of Technology Innovations". The task involving Taylor's University for this project is divided between two schools. The School of Computing & IT is responsible for developing apps and Web portal for farm management. The School of Hospitality, Tourism and Culinary Arts is responsible for developing the dairy food products as well as developing dairy farm tourism product. From our discussions and interviews with the farmers, there were a couple pain points which they have highlighted to us with regard to knowledge and improved process of services as listed below.

1. **Knowledge Base**—The farming industry is a booming industry, and it has much potential in Malaysia. There is a need for new methods and ways in farming industry, and there is also much research done by local and foreign universities with respect to the farming industry. How these information and knowledge are to be shared with the rural folks who actually need such information for improvement.
2. **Supply Availability**—Today, the way the farmers get orders and very manual and there is much pain from not just the farmer side but also retailers looking for supply. There is no way to check which farmer has the supply and as such the retailers would have to make many calls just to get supply.
3. **Retailers Inventory**—It is important for farmers to have an inventory list that could indicate daily supply information and also provide reports for future reference. The list can be used as a gauge for cases, whereby there is an oversupply or less supply of their farming products.

Keywords Mobile application · Farm management · Mobile knowledgebase

D. Ponnu (✉)
Taylors University, Subang Jaya, Malaysia
e-mail: devi.ponnu@taylors.edu.my

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20.1 Introduction

As what I have mentioned above, the main objective of this project is to increase the yield income of our target audience. In this case, we are focusing on the farmers in Malaysia. How do we improve their yield by using technology? A few questions arise when we look into using technology in rural areas. The first question that comes to my mind is the rural folks ready for technology ad would they use technology for their daily work routine.

The answers to these questions were found in research done by the Malaysian Communications and Multimedia Commission in 2014, whereby there is a significant change from the results found in 2012 which indicates improvement of the Internet use in rural area (Fig. 20.1).

From the research by MCMC, it was clear that there is huge potential in technology being the mode of how these farmers could reach high yield. Not only with the increase of Internet accessibility but also the use of smart devices improves the Internet penetration in rural areas. From the various researches, I also noted that the use of smart devices such as smartphones is the key to the success of any technology that is to be implemented in the rural areas.

Based on the above problem statements and technology penetration statistics, we need to find a solution that best helps the farmers and increases their yield as a whole. The outcome of this project should address the issues faced by the farmers and also retailers to ensure smooth operations.

20.2 Research Analysis

As mentioned above, the project was collaboration in which Taylors School of Computing (SOCIT) played a role in the technical section on the project. Nevertheless, in order to ensure that the end products produced are based on the needs and requirement, a research was conducted by Pearson Malaysia and IGAUPM. The research was mostly based on interviews conducted with the farm management. As mention above the project was collaboration in which Taylors School of Computing (SOCIT) played a role in the technical section on the project.

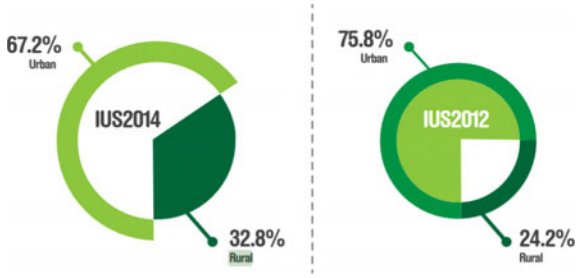

Fig. 20.1 Urban–rural internet penetration

Nevertheless, in order to ensure that the end products produced are based on the needs and requirement, a research was conducted by Pearson Malaysia and IGAUPM. The research was mostly based on interviews conducted with the Farm Management, MARDI and the farmers themselves. Out of all the objectives outlined for this project by Pearson, SOCIT would focus on the objective, MARDI and the farmers themselves. Out of all the objectives outlined for this project by Pearson, SOCIT would focus on the objective:

1. To educate, train and promote good farm management and best dairy practices and raise alternative income (i.e. incorporating agro-tourism).
2. To exchange information among dairy farmers, civil society and grass root organizations, veterinary officers, extension personnel, scientists and policy makers concerning issues and challenges concerning dairy farms in Peninsular Malaysia.
3. To discuss the strengths and weaknesses of current dairy farm management and practices.
4. To allow transfer of knowledge and skills gained to other dairy farmers.
5. To innovate new literacy solutions for dairy farmers using Pearson's products and services.

20.2.1 Scope of the Project

Based on the chart above, SOCIT would be involved in pillar 1 which is training. As such, the development of the project would focus on how knowledge and farm management is done using technology (Figs. 20.2 and 20.3).

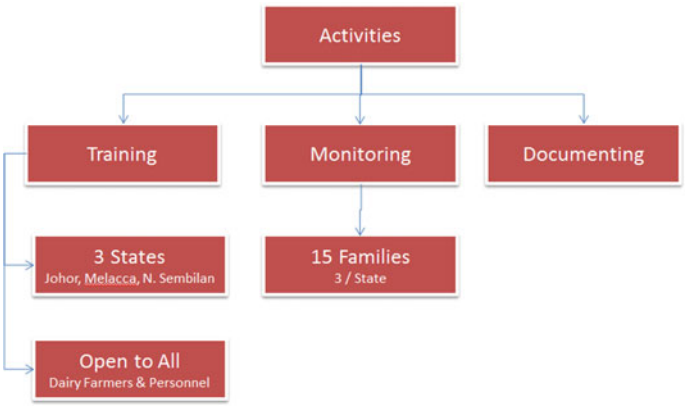

Fig. 20.2 Scope of the project chart

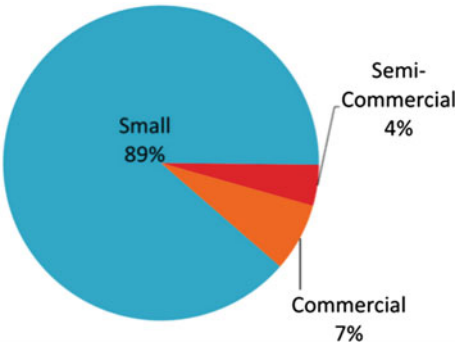

Fig. 20.3 Dairy farmers classification

This analysis was based on seven states selected for this project, and there are 111 farmers in total from these 11 states. The seven states are Perlis, Penang, Kedah, Perak, Johor, Terengganu and Pahang.

Based on MARDI research on the classification of farmers in Malaysia, 89% are small-scale farmers, 7% commercial-scale farmers and 4% semi-commercial-scale farmers.

20.2.2 Milk Production Data

Milk production is one of the core output from these farmers. The production of milk must always be adhered to some standards and ensure cleanliness as the output which is milk is consumed by consumers nationwide. Nevertheless, there seems to be lack of system or a coordinated effort in transporting the milk to consumers. The best way to illustrate the end-to-end process of the product distribution is by using a SIPOC diagram (Fig. 20.4).

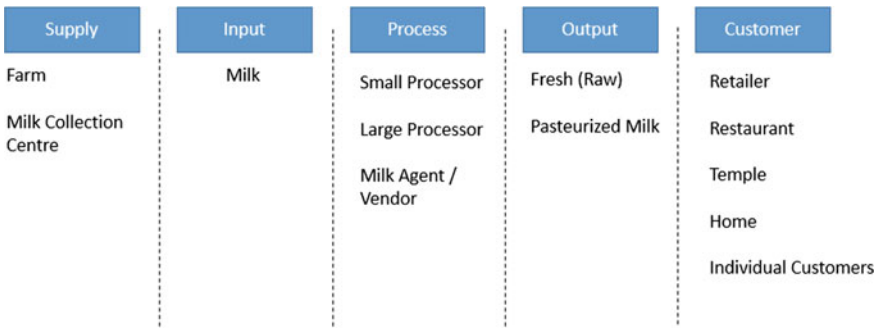

Fig. 20.4 Dairy product distribution SIPOC diagram

The milk production is a focus in this article as much of the issues are in handling or better management of the milk produced by these farmers. The milk production data are depicted in Table 20.1.

From the research report, there was also findings which relate to the current issues and difficulties faced by the farmers. The issues range from production of the product to marketing it to the end customer. Cause and effect diagram depicts the overall issues raised by the farmers (Fig. 20.5).

From the finding, we need to zoom into aspects of the issues raised which we could address via technology as to the scope of this article. It is clear that the lack of knowledge and farm management are the key issues which can be addressed with the help of technology, and the idea of developing a mobile application is ideal for such scenarios. Why mobile application and not Web application? As the trend has changed the world of technology which is now moving from Web base desktop access, people are now more prune towards using mobile phone to get their source of information. Based on a research by Pew Research Center,

> 68% of U.S. adults have a smartphone, up from 35% in 2011, and tablet computer ownership has edged up to 45% among adults, according to newly released survey data from the

Table 20.1 Milk production table by zone

Zone	States	Milk production per day (l)
North	Perlis, Kedah, Perak and Penang	3784
South	Johor	7005
East	Terengganu and Pahang	7112

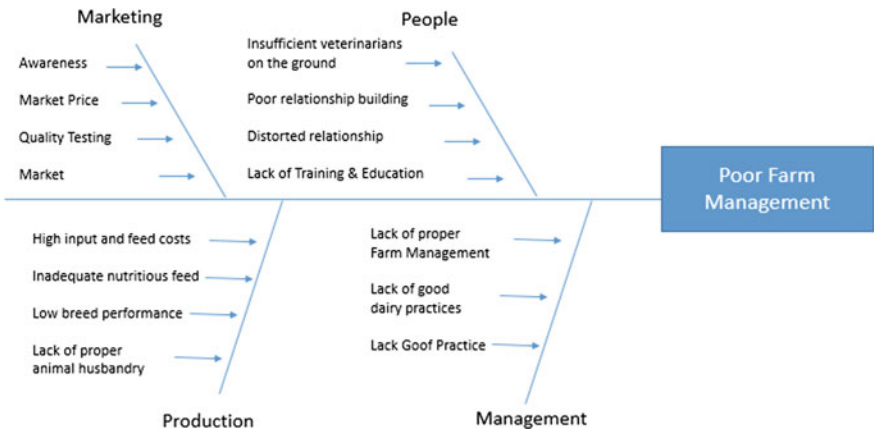

Fig. 20.5 Cause and effect diagram

> Pew Research Center.[1] Smartphone ownership is nearing the saturation point with some groups: 86% of those ages 18–29 have a smartphone, as do 83% of those ages 30–49 and 87% of those living in households earning $75,000 and up annually.
>
> (PewResearchCenter, 2015)

Even in Malaysia the trend is the same as per the US. Based on an article in the Malay Mail Online authored by Yiswaree Palansamy entitled "Smartphone use tops PCs in Malaysia, three Asian nations, Google survey shows",

> it was reported that 51% of local respondents relied on smartphones for web access versus 39% who used computers.
>
> (Malay Mail Online, 2016)

Based on the trends of mobile usage around the world, it was an ideal solution for the farmers and we could be able to address the concerns below by developing a mobile application which can give the information and knowledge required directly to the farmers in a much easy and fast manner.

20.3 Solution Development

Based on the analysis and trends, it was clear that mobile application would be the best fit for these farmers as they each own a smartphone and carry it around with them in every tack that they perform at the farm. This section describes the mobile application focus in resolving the issues which we have described above. The section details the structure and building blocks of the mobile application. The application development is divided into two main categories: the information dissemination and milk order and inventory system.

1. Knowledge Dissemination
   The knowledge section is divided into two. One is farm management and the other hygiene milk practice. The farm management application would cover topics such as biosecurity, vaccine management, environment management, staff management, livestock management, farm and equipment management. The hygiene milk practice would cover topics such as management of milk production, important definitions in the milk industry, milk production process, milk production guidelines and others (Fig. 20.6).
2. Milk Order and Inventory System
   Based on the findings, it was also known that the supply of milk-related products to the various consumers lack certain process or mismanagement. This results in the oversupply and wastage of milk products. As the current process is manual, there is a challenge in synchronizing the various milk suppliers and demand from consumers (Fig. 20.7).

[1] http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/#fn-14935-1

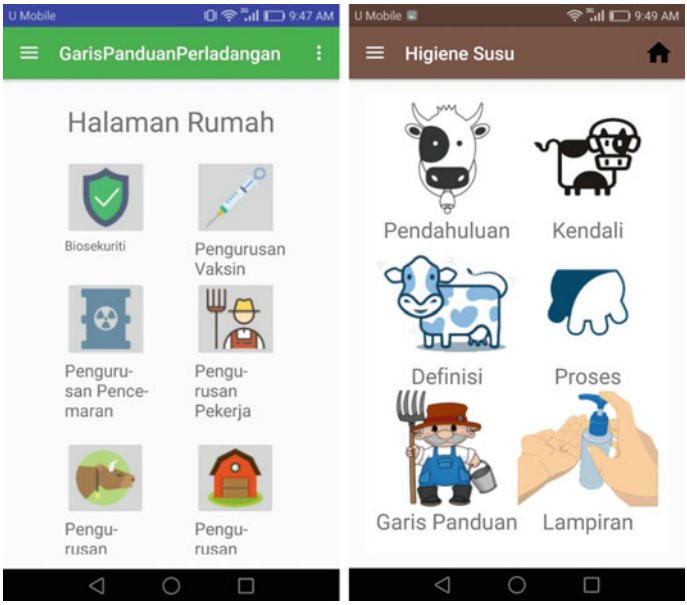

Fig. 20.6 User interface for mobile application

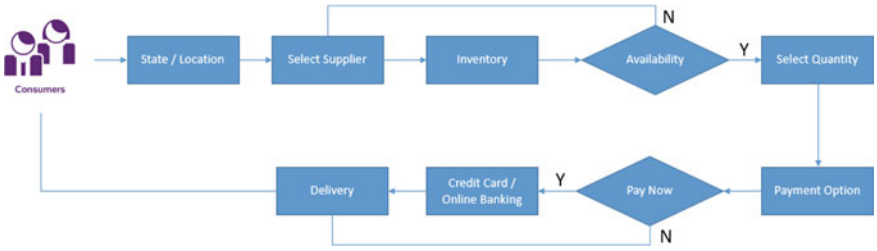

Fig. 20.7 Proposed distribution process flow

The diagram above depicts the high-level process flow of the intended system. As this is only the first phase, a simple and effective process is needed. The process starts with the consumer selecting the state in which they want the milk product to be purchased from and then selecting the supplier based on the list provided to them. Once selected the desired supplier, the consumer would be able to view the amount of stock available from the supplier.

At the back end, the quantity of milk products, i.e. the inventory would be managed by the system in which the supply would decrease or increase based on the demand from consumers. By this the supplier would always have sufficient stock and based on the purchase trend. The farmers could avoid oversupply of milk products.

The consumer would also have a choice of paying the farmers directly, or they could opt for paying upon receiving their milk products. The application would resolve in much competitive and efficient farm product management and at the same time look into the inventory management.

The application would be built for the Android operating system as it is also known that the Android smartphones are relative cheaper and affordable ownership. This would mean that the population of the lower-income group would have an Android smartphone OS when compared to owning an Apple iPhone IOS system. Based on data from Demystify Asia article entitled "**Android vs. iOS Market share in Asia**",

Android OS has 82% market share and IOS has 18% market share in Malaysia in the year 2015 (Demystify Asia, 2016).

20.4 Summary

The focus of this project is to have three separate functionally different applications. Many applications that have been developed by Android and IOS developers often merge many functionalities into one single application. Such application creates many layers of navigation which in return creates unfriendly usability, whereby consumers have to click many layers in order to obtain the information that they require. This may be applicable to a Web base application using a desktop but may not be the same for a mobile application.

Bearing in mind that the mobile application has a much smaller resolution and screen size, one has to develop the application with lesser number of layers. The information much be obtained faster and ideally within less than three touches.

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Chapter 21
Participation, Produsage, and Pedagogy: Social Media as a Tool to Enhance Teaching and Learning Experience

Vandana Saxena

Abstract The rise of the Internet and social media has brought about dynamic changes in reading and writing. Reading in the digital age is a communal, collaborative, and participatory activity. Axel Bruns conceptualizes such activities by the term 'produsage,' a combination of production and usage. The reader not only reads a text but also assumes the mantle of a producer by creating content on various digital platforms. This paper reflects on the impact of these changes within a literature classroom. Through 'Wheels within Wheels: The Crucible on Twitter' a collaborative project in which the students of literature reenacted Arthur Miller's play The Crucible on Twitter, this paper explores the ways in which the new age participatory and collaborative reading can be harnessed as a pedagogical tool to enhance teaching and learning experience.

Keywords Participatory cultures · Produsage · Pedagogy · Literature · Twitter · Arthur Miller

> …this discovery of yours will create forgetfulness in the learners' souls because they will not use their memories; they will trust to the external written characters and not remember of themselves. The specific which you have discovered is an aid not to memory, but to reminiscence, and you give your disciples not truth, but only the semblance of truth; they will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality. (Plato, *Phaedrus*)

With these words, Plato cautioned the Greeks against the science of writing. He saw writing and reading as activities that would debilitate memory, cultivate dependency on external devices, and replace real knowledge with a mere show of wisdom.

V. Saxena (✉)
Taylor's University, Subang Jaya, Malaysia
e-mail: Vandana.Saxena@taylors.edu.my

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On a close examination, these charges echo our own anxieties and admonitions when we see a youngster bent over a computer, browsing away into the vast domains of the World Wide Web. Maryanne Wolf (2007) seems to be repeating Plato when she fears that 'many of our children are in danger of becoming […] a society of decoders of information, whose false sense of knowing distracts them from a deeper development of their intellectual potential' (p. 26). And in an ironic twist of ideas, this time the anxiety over the Internet taking over that youngster's life is coupled with the anxiety over the fading habit of reading and writing—concerns which are echoed by surveys and statistics. For instance, according to National Literacy Survey, 2005, Malaysians, on an average, read only two books a year. Over 80 percent of the university students are reluctant readers of English language material, that is, they read only because they have to (Inderjit, 2014).

But if one looks closely at the Internet, there is another side to this story, and it is not so disheartening. The recent years have shown a rise in the sales of e-books vis-à-vis the traditional print (Campbell, 2016). There are categories like audiobooks. There is further evidence of dynamic reading and writing available on numerous social media networks. Wattapad, for example, is a mobile reading app launched in 2006. Nearly 45 million people use it every month. There are over 100,000 uploads in a day and over a 2 million writers, and an overwhelming majority of these are the teens ('Wattapad Pressroom'). Its rival, Figment boasts of 300,000 young users who upload 30,000 pieces of fiction and nonfiction a month. Each of these stories garners likes, the most popular going about 20,000 likes per update (Tarbox, 2014, 55).

These digital playgrounds are the breeding ground for new genres. For instance, the first cell phone novel published in Japan in 2003. Written in chapters of 70–100 characters, the work is disseminated via short messaging service or SMS. It is an interactive genre where the readers review, comment, and applaud as the writers produce the stories. The massively popular 'The Lizzy Bennet Diaries' by a 20-year-old grad student is an adaptation of Jane Austen classic *Pride and Prejudice* into a groundbreaking multiplatform series. It reimagined Austen's story around a fictional vlog filmed in a single room in front of computer screen. 'The Lizzy Bennet Diaries' became the first YouTube series to win a Primetime Emmy in 2013 for Outstanding Creative Achievement in Media-Original Interactive Program.

There is enough evidence to show that young readers today not only read but engage with the texts deeply. They critique and comment on the online discussion forums. They create and share reading lists on Amazon and Goodreads. They often go further to create their own version of the stories in the form of fan fictions and videos. The online fandom of popular texts like the *Harry Potter* is colossal with over 600 million Internet archives, more than 2500 discussion forums, and 500,000 stories on a single fan site like fanfiction.net, a number of blogs and Web sites discussing every aspect of the series (Saxena, 2012).

So instead of a decline, these engagements signal a new kind of reading that which is no longer solitary where the text talks to the reader in a one-way relationship mediated by publishers, libraries, teachers, or parents. This reading has its

own dynamics of reader–writer interaction, instant feedback, serialization and visualization of stories, and so on. The stories move across the mediums and time frames always evolving and making way for newer versions. It is a collective, collaborative, and interactive activity, mediated by technology and embedded in a digitally connected network. The rise of new genres such as Twitter drama or cell phone novel is a testimony to the dynamic evolution of digital storytelling or e-lit over the recent years.

Bruns (2007a, b) conceptualizes such collaborative and participatory activity as *produsage,* a portmanteau word that combines production and usage. It stands for the activities like that of a reader in the digital times. The barrier between the producer and the users collapses as the users' appropriate tools and skills of production. The readers of the digital age are embedded in this environment of produsage which proliferates with them as they invent and reinvent the texts, giving new meanings and interpretations and producing multiple versions of the source text.

What are the implications of this paradigm shift in reading for a literature classroom? Could the activity of produsage be employed as a pedagogical tool? How can it complement and enrich the process of teaching and learning literature? The project 'The Crucible on Twitter' implemented in a university literature classroom aligned the idea of Web-enabled participatory reading and writing with the constructivist approaches to learning in a literature classroom. Students used Twitter, a social media microblogging platform, to write an adaptation of Arthur Miller's 1950s play '*The Crucible.'* The goal was to enable classroom engagement with a literary text through activities that felt meaningful and important to our networked students; activities that offered opportunities to reflect on the text and reinvent it in the contemporary context using a range of writing activities that students are familiar with outside the classroom such as tweeting, online commentaries.

Twitter was particularly suited for the project since its real-time microblogging can imitate a dramatic text. It invites critical, collaborative participation suitable for a close-knit online writing community. The model of fan fiction, wherein the readers and writers use their favorite texts to develop alternate story lines and plots, was used to develop an understanding of the text and gain insights about the key elements of the literature.

Through means of this project, this study is an attempt to understand:

1. A new technology-enabled pedagogy which is productive, participatory, and collaborative;
2. Produsage as a medium to foster deeper engagement with literature;
3. Produsage as a tool for student empowerment.

This paper draws its theoretical tools from the theories of digital reading, participatory cultures, and active pedagogy. Subsequently, it lays out the methodology, the details of the project, the associated learning outcomes, and the justifications for a case study. This leads to the final discussion on the digital platform as a tool for collaborative learning and a space for creative expression.

21.1 Participatory Cultures, Produsage, and Pedagogy

Many of the current, and certainly most of the next, generation of learners are remarkably immersed in technology. Prensky (2001) designates them in metaphoric terms as 'digital natives' referring to the 'native speakers' of the digital language of computers, video games, and the Internet who have grown-up with these new technologies. On the other hand are the older generations of 'digital immigrants' who have adapted these technologies over the period of time. In 'digital natives, digital immigrants,' Prensky points out the remarkable gap between traditional forms of teaching and learning systems and the world of students which has changed dramatically with the advent of technology: 'as a result of this ubiquitous environment and the sheer volume of their interaction with it, today's students think and process information fundamentally differently from their predecessors.' In his book *Language and learning in a Digital Age* (2011), John Paul Gee has emphasized learning environments embedded within the sites of popular youth culture like the Internet which competes and complements our traditional education in several aspects.

One of the major markers of this digital environment is its participatory potential. Jenkins (2006) calls it a milieu of participatory culture which has the ability to transform personal reaction into social interaction and spectatorial culture into the participatory culture. Fan fiction is a manifestation of such appropriation of a text. Elsewhere, citing the case of the *Harry Potter* series, I have discussed Internet as a site of adolescent writer's appropriation of authorship which results in an 'endless play of narratives': In these adolescent narratives, 'the source text is constantly deconstructed, its apparatus taken apart and reassembled with new meanings' (Saxena, 2012). There are innumerable spaces on the Internet where readers not only discuss and comment about a text but go a step further by writing their own versions.

Hence, Trendwatching.com recently identified 'Generation C' (for 'content')—the generation responsible for the development of open source software, legal and illegal music file sharing, creative content sites such as YouTube or Flickr, citizen journalism, and so on (2004). One of the key features of Generation C is its strong preference for replacing the proprietary hoarding and dissemination of information with the establishment of a common knowledge base. Hence, the reader no longer follows the existing production chain developed during the mass media age with its traditional author → publisher → reader or one-to-many flow of information.

Roles in the digital environment are fluid. According to Bruns (2007a, b), 'networked media levels the playing field by offering an opportunity for audiences to become content creators in their own right, and by eroding the ability of the distribution stage to act as an impassable bottleneck for user-created content.' Thus texts are written and disseminated freely online. Networked content is inherently collaborative as the readers comment and offer suggestions which the writers use to shape the stories which are never complete because there is next version perpetually

lurking on the margins. Such technology-enabled produsage collapses the distinctions of production, consumption, and creation at once.

Digital reading imbibes what Bruns and Humphrey (2005) have highlighted as the key characteristics of produsage:

1. It is user led and collaborative. Produsage occurs in a collaborative communal environment in a shared project that is incremental, iterative, and evolutionary. This is an important shift from traditional production which relies on the existence of dedicated and specialized team to a community of amateurs. The writers on the Web have a network of beta readers or editors, readers who comment and shape the narratives or simply those who 'like' and encourage writer.
2. Participants occupy fluid roles. The writers not only write but also edit, develop art, or simply read the stories of the fellow writers.
3. Produsage is palimpsestic or evolutionary development of the existing content. In the online world of storytelling, stories are forever unfinished. Narratives build on existing narratives, exploring its nuances long time after the source text has concluded. Hence, on the Web, a story is always a work in progress. Each story is one of the several versions floating around in the domains of Internet.
4. The content in the produsage economy is a common property, although recognition of the individual merit of contributors and contributions is a standard feature. It is a recognition of the collaborative nature of the work process and the evolutionary nature of the content itself which builds on preexisting narratives. The notion of singular authorship is taken over by multiple producers and collaborators.

Produsage, then, can be roughly defined as collaborative content creation led by users or at least crucially involves users as producers. And the digital natives of today are inextricably integrated with this produsage environment.

In such a scenario, there is an urgent need to review the traditional pedagogic models, especially in a literature classroom to keep up with the changing reader–author dynamics. The task of education in the digital times is twofold: firstly, to ensure that the graduates leave the university equipped for successful participation in produsage environments. Secondly, in order to develop such capacities, it is necessary that universities integrate produsage in their learning and teaching environments. Though several theorists have foregrounded the use of produsage in foreign language acquisition (Mora & Leeming, 2013; MacKinnon & Pasfield-Neofitou, 2016), its potential for role-playing in literature classroom is yet to be explored in depth. Furthermore, as a mode of digital produsage wherein students can create and write their own texts, Twitter is largely an unchartered territory. Studies exploring fan fiction phenomenon mostly as cultural studies of fandom, fannish behavior and rituals, and so on mostly turn to fan fiction sites and blogs; Twitter is rarely taken into account as a medium for such activities. This paper unpacks the potential of Twitter as a platform for online collaborative learning—through production and usage—in a literature classroom.

21.2 Preparing to Write

i. Laying down the rules

Written in 1953 by famous American playwright and Hollywood scriptwriter, Arthur Miller, The Crucible tells the story of Salem witch hunts in 1692. The central themes are religious intolerance, injustice, and mass hysteria. Conceived during the height of McCarthyism, *The Crucible* was also a political intervention in turbulent times. Religious persecution and hysteria in the Miller's portrayal of Salem were a thinly veiled comment on political persecution and intolerance of the McCarthy era. Though its themes are still relevant, the text is fairly dated in terms of its setting and characters. However, it is an important text in America's literary history tracing race relations, religion, and early colonial society.

The students were assigned the task to adapt this 80-year-old text to the setting of Twitter 2016. The task was undertaken by the students of literature—mostly from the second year of the university. Students were generally familiar with the idea of tweeting though only a few had a Twitter account. Each student adopted a character from the play and studied its development, its relationships, and its positioning vis-à-vis the plot and the setting of Miller's play. Students also referred to the historical incidents like Salem witch hunts and documents pertaining to their characters. In the case of the minor characters and gaps in their narrative, students were encouraged to give them a life history and story, quite like the fan fiction practices.

At the beginning of the project, the teacher set out guidelines. The premise was to retain the themes of mass hysteria and persecution but relocate them in the contemporary context. The play was reframed and rewritten on shared documents before being tweeted on online. Each act was tweeted within a day, and the class agreed on a gap of a fortnight between each act.

Apart from the product—the adaption of the play—various other techniques such as participation, observation, and journal writing was used to gather additional insights.

ii. Taming the Twitter

Twitter was chosen as a social media platform to write the play. Twitter is a social information media network that connects the users to information that they find interesting. Tweets are short bursts of information, opinions, and messages, up to 140 characters in length—a limitation that imitates the mobile phone's short message service. This feature sets Twitter apart from other writing platforms like Wattapad or the blogs. A tight formal constraint shapes the content and the form of writing demanding acute precision and clarity. What is more surprising is the way it is reshaping the rules of composition and performance of twenty-first-century literature. Responding to the extreme word constraint of the platform, writers have composed Twitter poems, Twitter microfictions, Twitter novels, and a growing

number of Twitter plays. These genres respond to the dynamics of the Twitter universe.

Decentralization lies at the heart of literary experiments on Twitter. A work of art and freedom of expression moves beyond the purview of authors and publishers to percolate down to the readers and learners. Fan fiction communities exploring their favorite texts have already created noncommercial decentralized online platforms that are gathering points for collective creativity and expression. Like the fan fiction writers, the students used the characters and the text of Miller's original play and placed them in the Twitter environment. This change of setting referred to as alternative universe in fiction parlance is common in the fan fiction community.

Another distinctive user-centered feature of Twitter is the idea of following, that is, users may subscribe to other user's tweets and subscribers are known as followers. 'Following' means engagement in a real-time communal dialogue, public and community debates, exchanging suggestions and opinions. For the purpose of this task, following each other created a small closed community that imitated a small village community where rumors float and hysteria is whipped up with a few utterances. In the Twitter world, 'following' might indicate similarity of thoughts and opinions or interest. It is often an indicator of social popularity. However, the literal description of 'following' as verb suggesting continuous pursuit imitates the continuous pursuit of the scapegoats in a rumor-driven community within the play.

While the individual tweets are bound by structural constraint designed in Twitter (like the character limit or the sequential display of tweets), on their own they are not sufficient to produce communicational order. Every second, on average, around 6000 feeds are tweeted on Twitter which corresponds to 500 million tweets per day. Honeycutt and Herring (2009) discuss how Twitter may be experienced as a 'noisy' environment, with a constant flood of overheard non sequiturs, with little relevance to the reader, or messages may appear as interwoven conversations.

Twitter literature overcomes the barrier by the use of the @ prefix to refer to a Twitter user, and hashtags (#) are used to categorize tweets by topic or event. The use of hashtag #thecrucibletuadp became a means to set the narrative apart from other random utterances on the platform creating a sequential flow of a narrative. Every character has the extension _TUADP to make them stand out as a part of this exercise. These tools enabled us to put the feeds together as a part of a single narrative.

Apart from these, the tools like memes became handy to express emotion, especially in a virtual drama where the stage asides and emotional reactions are limited. These remained a key characteristic where the virtual performance differed from the theatrical one.

21.3 Results

The study revealed that student-led digital adaptation of the text helped in achieving learning outcomes, generating positive perceptions about reading and writing, and empowering the students as creators and writers.

i. Achieving learning outcomes

The novelty of the Twitter as a platform for writing a play made it an ideal tool for reflecting on the elements of the literature. After the preliminary discussions on characterization, plot, and setting, the project offered an opportunity to explore these elements through a reader-response approach. A literary approach focuses on the reader's role in creating meaning and her experience of a text, and reader's response recognizes the reader as an active participant in the textual universe (Fish, 1982; Iser, 1978).

The project required the students to inhabit the textual universe of Miller's play, deliberate on its characters, their motivations, their desires, and weaknesses before they could place them in the new setting. The students were assigned one or more characters from the play, and they had to tweet as their assigned characters. They developed Twitter usernames and profile photographs and were encouraged to retain the character traits of Miller's characters. Several students who were assigned minor characters moved beyond the text to conduct research on the characters and historical events of Salem 1692 to gain insights. These were then adapted to the Twitter parlance, where the students retained the original character traits like the weak paranoid nature of Reverend Williams, the hot-headedness of Giles Corey and excessive piety of Elizabeth Proctor. According to one of the students, 'we reflected on our characters, think of how they would react in a situation like this, in a world like this. And it we started from that point.'

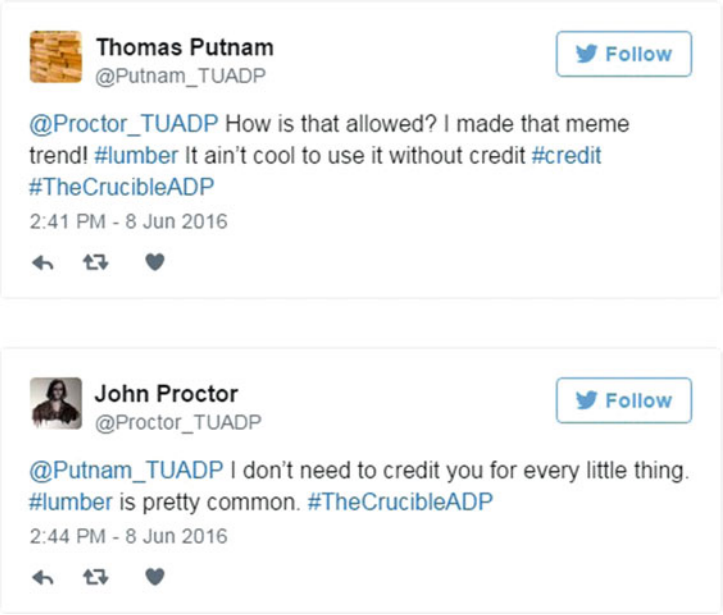
Similarly, the themes of mass hysteria were retained as the text moved Salem 1692 to Twitter 2016 though the religious devotion of the puritan colony transformed into an obsession with social media and Internet, the closed online community.

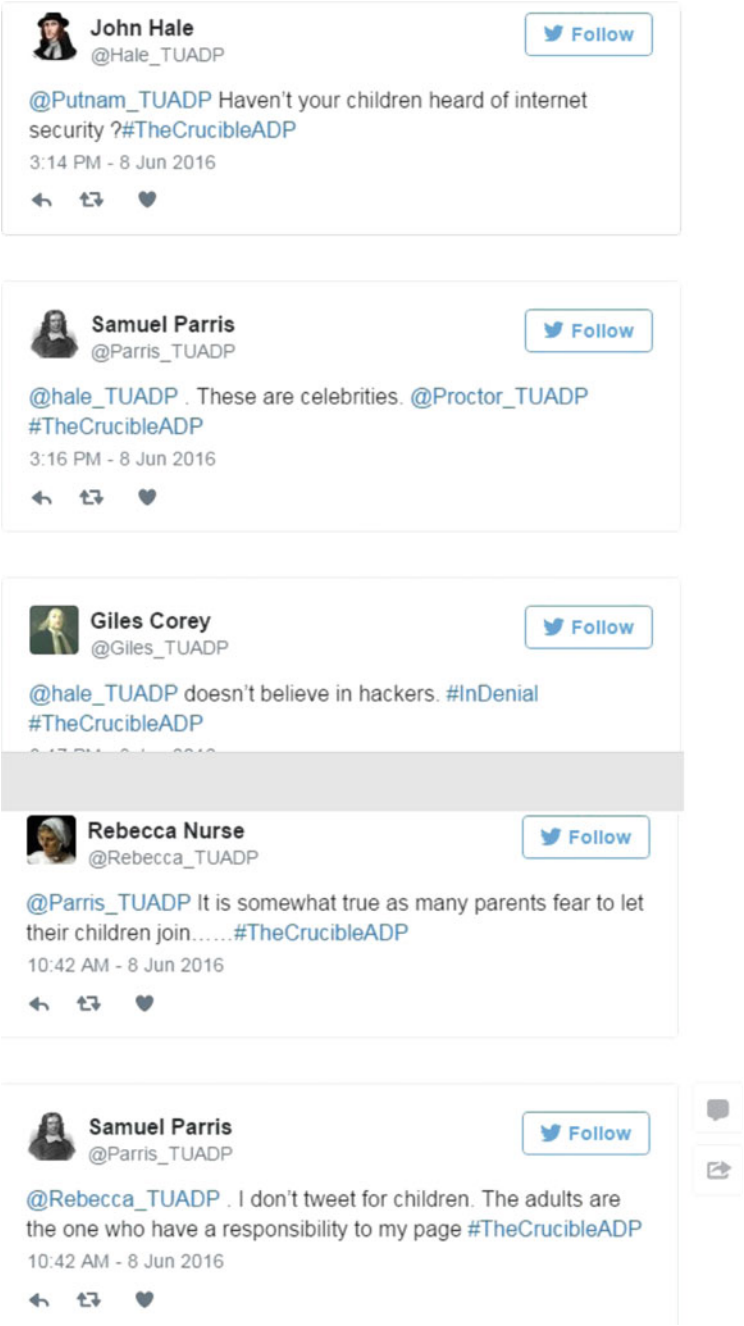
While the students actively retained these elements from the original text, the style and tone underwent a major change. The social tragedy of Miller's *The Crucible* was replaced by tragicomedy in the world of Twitter. Like the religious community of Salem which is a creator and victim of its rules, the protagonists of the new play are immersed in the networked world; they are the creators as well as the victims of its oppressive conventions which have taken over their real lives.

ii. A cultural and social expression

At any given time, a text is a product of the social and cultural forces of the era from which it emerges. Though it concentrates on Salem witch trials of 1692, Miller's play a direct attack on McCarthyism. Hence, *The Crucible* is grounded in its historical and cultural context.

The adaptation revealed several themes grounded in the social and cultural milieu of the students. Here are some snippets from the Twitter play reflecting concerns that are contemporary and global on issues such as copyrights, spamming, abuse of social media, parental control. The project made the students feel empowered to intervene and voice their concerns.




John Hale
@Hale_TUADP
Follow
@Putnam_TUADP Haven't your children heard of internet security ?#TheCrucibleADP
3:14 PM - 8 Jun 2016
Samuel Parris
@Parris_TUADP
Follow
@hale_TUADP . These are celebrities. @Proctor_TUADP #TheCrucibleADP
3:16 PM - 8 Jun 2016
Giles Corey
@Giles_TUADP
Follow
@hale_TUADP doesn't believe in hackers. #InDenial #TheCrucibleADP
Rebecca Nurse
@Rebecca_TUADP
Follow
@Parris_TUADP It is somewhat true as many parents fear to let their children join……#TheCrucibleADP
10:42 AM - 8 Jun 2016
Samuel Parris
@Parris_TUADP
Follow
@Rebecca_TUADP . I don't tweet for children. The adults are the one who have a responsibility to my page #TheCrucibleADP
10:42 AM - 8 Jun 2016

Thus with its reflections and commentary on the online world—its addictive nature, cybercrimes like hacking, and issues of parental concern—the adaptation often turned out to be a metacommentary on its own format and platform.

iii. Assessment

The project integrated conventional classroom assessment with the integrated performance-based assessment. The three modes of communication in an integrated performance-based assessment—interpersonal, interpretive, and presentational—were integrated as students applied the knowledge and skills they developed during the classroom discussions into the writing of the new play. The students read and discussed Miller's play before adapting it to the new paradigm in a way that the themes of the adaptation resonated with that of the original play. This interpersonal, interpretive stage was then followed by a presentational stage, wherein the students tweeted the drama as the characters of the play.

This raises the question broached by many assessment researchers of how to assess individual student's participation. In this case, the collaborative adaptation was used as a tool for the students to articulate their developing understanding of the literary elements and the key themes of the text. Journals were used to assess student's reflection on the original play, their understanding of literary elements such as characterization, setting and conflict, authorship, and the experience of writing a play in a new format.

For instance, commenting on the limitations of their new play in his journal, one of the students felt that though the intention and tone had changed completely, the adaptation retained the subtext of paranoia and suspicion that marked Miller's play. Another journal commented on the lack of single unifying authorial point of view which is one of the main drawbacks of their adaptation. Reflecting on the dramatic elements of the performance in her journal, one of the students commented on the inability to integrate stage asides and murmurs and the inadequacy of the memes as a physical expression of the emotions.

Thus, the process of writing a digital adaption encouraged a deep level of reflections and engagement with the given text. Performance-based method alongside the conventional assessment consisting of literary analysis and essay writing ensured that digital activities and the reflections were indeed leaving every student with enduring understanding of both the text and the targeted literary concepts.

21.4 Discussion

Interest-driven close-knit communities in an informal learning environment lead to highly motivated and active participation (Ito et al. 2009). They create a participatory culture where members believe their contributions matter (Jenkins, 2006). Similar perceptions were built within the classroom during the task: Students

steadily increased in their ability to reflect on the character and how he/she would react to a situation. There were discussions on style and tone suited to the character. Different tools offered by Twitter became tools for digital enactment. For example, one of the students came up with the idea of retweets to imitate rumor mongering.

The ease with which the students embraced the idea and the excitement during the process of creating the digital adaptation drove the project toward its completion. In the process of student-led content creation, several traditional dichotomies —author–reader, producer–consumer, teacher–learner—are collapsed. The learning during the process was collaborative, peer-led, and reflexive. Each collaborator–creator recognized her role as one among a number of others. Like the collaborative relationships of produsage, these relationships were heterarchical; that is, the members existed in unranked position and remained fluid as they took over different roles and capacities during the process.

Instead of hierarchy that marks conventional pedagogy (driven by the text and the teacher), collaborative pedagogy engaged critical and communicative capacities of the students. One of the students in his journal reflected on the ways to write a drama on other digital platforms like Instagram. Another is more vocal in her journal:

> I have always enjoyed literature but some part of me have always associated it with old-fashioned plays, poetry and novels Since then, l feel like my eyes have opened to a whole new world of language. It is at once the same prim and proper art I remember and renewed slang of the current generation. I have heard that some people study better by application. I have recently discovered that I am one of these active learners and this project has definitely helped me better understand literature. I think it is actually pretty cool that we managed to turn an old play into this modern Twitter version. The best thing about this was that it didn't even feel much like work because I enjoyed the process so much.

Thus, peer-led content creation enabled the students to develop informed, self-reflexive, and critical perspectives on their curriculum as well as their own online activities.

It led to the reconsideration of the nature of a literary text. Miller's play *The Crucible* no longer confined to being a masterpiece tied to a historic era. The Twitter adaptation broke the barrier of intimidation that classical works of literature evoke. The text became approachable, readable, and rewriteable.

This decentralization opened the text to a multiplicity of meanings which is a characteristic of online storytelling: 'Hypertextual environment of storytelling on the Net turns from linear, structured and hierarchical forms of storytelling towards a decentralized and changeable media where the narratives constantly shift along with the hyperlinks. Constantly in flux, and renewing itself with each narrative, the Internet offers a world where stories are never complete. There are possibilities for endless versions' (Saxena, 2012).

In a project like this, the teacher plays an essential role not in terms of imparting information but of providing thematic support and enabling the organization of the task. Addressing the role of a teacher in empowering adolescent literacy, Bean and Harper (2004) insist that recent technological shifts have brought about a fundamental shift in what it looks like to be a reader and writer and what literacy skills

look like in these changing times. It has raised the need to reassess the role of a teacher in the contemporary scenario. According to Bruns, the teacher's role in the twenty-first-century classroom is that of facilitating systematic development of knowledge and creating a space for a more user-led and learner-centered experience. During the task, when student expressed their reservations about using Twitter, the teacher's ability to explain the pedagogical outcomes had a significant impact. As a participant observer, the teacher was able to observe the development of the script, suggest changes, and encourage reflections on the text—the original as well as the adaptation. The aim of the teacher during the task was to strike an effective balance between creative freedom and appropriate guidance.

21.5 Limitations and Recommendations

This research involved a group of 15 students pursuing literature in a tertiary educational environment. Though most of the students were new to Twitter, they were familiar with the dynamics of social media and its usage. Since all of them had been using platforms such as Facebook, Instagram, and others, the stylistics of communication, the interactional undercurrents within a virtual community were not a novelty. From the initial stages, memes, emoticons, and other Twitter elements such as 'retweet' and 'like' became tools of expressions. Hence, for students well versed with social media, adapting to a new platform like Twitter was only a matter of adapting to a different interface.

Similar strategies like adaptations and role-playing wherein a text, or a particular situation or a debate is analyzed as students assume different personas and present different perspectives. Then, there is a reader-response blogging which is particularly effective given the instantaneous nature of response. The exercise would encourage an open-minded approach. The public nature of Twitter provides a platform that is truly global, and sharing their views, ideas, and texts here could help in the development of worldliness and responsibility that goes along with the freedom that social media offers and youngsters love.

One of the greatest limitations in the integration of social media in an educational setup is the accessibility of the new media technologies and the opportunities for participation they present. Running a similar project in institutions with limited technical support and connectivity would require a different kind of preparation and manipulation of resources.

Student's safety and security in the online environment, and monitoring information and material accessed during the online sessions bring to fore the ethical issues concerning the use of technology in education. The exercise encouraged the students to reflect on these issues as evident from the reference to cybercrimes in the student adaptation of the play. The role of the instructor is especially important in a developing the rules, regulations, and an acceptable use policy.

21.6 Conclusion

In *Phaedrus,* Plato's anxiety overwritten word as a threat to memory captures the duality that underscores media and technological innovation. Just as the emergence of written word affected the oral traditions, and the emergence of print had a far-reaching impact on the written word, the rise of new media has changed our relationship to the printed text. Every new form of media reframes the existing pattern of collective life, its patterns of production, and dissemination of information. The current form of interactive reading upsets several traditional equations. Unlike the academic and scholarly modes of critique and analysis, digital adaptation enabled the students to engage with Miller's text on its own turf. The drama was understood and interpreted through the process of writing another drama that analyzed, read, and at times misread the source. It also empowered the students to insert the concerns and issues of their world into the text as they talked about their own online activities and dangers lurking in that unguarded world.

The activity required a careful reconsideration of the role of the teacher. Bruns (2007a, b) insists that 'educators must learn to become guides through a wealth of always already available information, rather than hanging on in any way to long-outdated notions of the teacher as controlling what information and knowledge students do or do not encounter.'

In an article written in 1999 considering the rapid evolution of technology and its impact on education, Cynthia Selfe insists that we must not only teach with technology but closely examine the implications of such technologies. Selfe posits that students must be encouraged to view technology from a critical stance. This project was initiated with the aim of encouraging student participation in a literature classroom by placing a literary text within the social and cultural milieu of the students. Instead of traditional reading, discussion, analysis, and essay writing, the project aimed at a deeper engagement with the curriculum text, much like the way the students engage with their favorite texts in the online environments. Embedding these dynamics of participatory culture in the classroom was successful in generating high motivation and collaboration. At the same time, the students grasped the literary concepts and themes in the play through discussions within and outside the classroom.

A reconfiguration of teaching practice that places the student/reader as a passive receiver of information from the teacher/author into a more democratic process in line with the principles of produsage can be viewed as a challenge. It undoes the traditional models of pedagogy which centers on the text and the teacher and enables an exploration of a new model of participatory, collaborative pedagogy which aligns with and values student interest.

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Chapter 22
WikiDoc—Integrating Wikipedia Semantic for Document Assistance

Jer Lang Hong

Abstract Most conventional readable documents are written in plain text. The author of these documents assumed that the audience have sufficient knowledge in order to understand it. However, this assumption may not necessary be true. In this paper, we develop a word tagging technique where those highly technical words are tagged with pop-up boxes containing specific explanation of the word. The tagging is done using semantic in Wikipedia, where the meaning of the word can be fully exploited based on their semantic. Study shows that our method is highly effective in helping the users to learn the technical details on the documents.

Keywords Web semantic · Wikipedia · E-Learning

22.1 Introduction

With the advent of Internet technologies, content has been made easily accessible and users can conveniently obtain information anywhere in any location of their choice. The development of smart mobile devices and the wide availability of large and fast Internet coverage have made it possible to access a high bandwidth Web site. However, the navigation and user-friendliness of browsing a Web page remain the same. To improve on the usability of a Web site, developers introduce Web 2.0 technologies to ease the users for navigating a Web site. Web 2.0 includes state-of-the-art technologies where dynamic server-side scripts are used to display highly responsive Web contents. In addition to that, Web 2.0 introduces personalization where a Web site could adapt to user's behavior and browsing patterns.

Recently, Web Semantic has been introduced where the contents of the Web are indexed and labelled with meta-data tagging. Unlike previous Web page where contents are generated in a static manner, Web Semantic categorized data into their logical unit identities, where they are grouped according to their semantics.

J.L. Hong (✉)
Taylor's University, Subang Jaya, Kuala Lumpur, Malaysia
e-mail: davidhong@evault.com.my

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Fig. 22.1 An example of static web site

Web Semantic helps in data identification and also faster processing. A typical example where data are labelled semantically is Wikipedia, where it houses a powerful semantic engine which could effectively produce and map data to its logical unit (Fig. 22.1).

Inspired by the semantic engine provided by Wikipedia, we develop WikiDoc, a Web tool which could effectively label Web content using Wikipedia semantic tool. A thorough investigation indicates that most users are having difficulty in digesting Web content upon browsing. Some, if not most, of the Web pages are written in languages hard enough for ordinary users to understand them. Therefore, a simple, easy to navigate pop-up menus are developed where they will generate a definition of the keywords upon user browsing. After that, we conduct a user study to show the effectiveness of our tools. Experiments show that our tool is highly effective for the user's browsing and convenience of using the Web site (Fig. 22.2).

The paper is divided into several sections. The next section describes research related to ours, while the subsequent section explains the methodology in detail. Then, we present our experimental results and finally we conclude our work (Fig. 22.3).

Fig. 22.2 An example of how a dynamic web site works

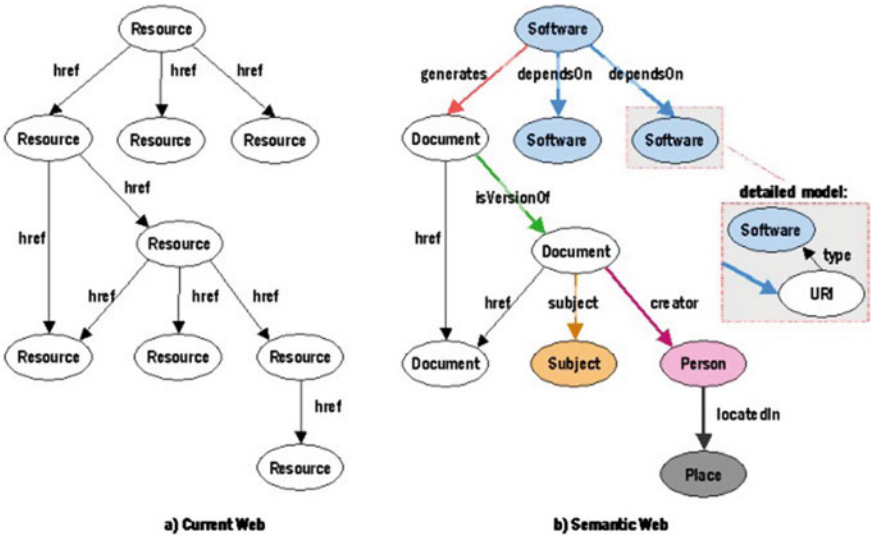

Fig. 22.3 An example of semantic web

22.2 Related Work

Research in semantic has grown rapidly since 1990s. With the state-of-the-art semantic tool in Wikipedia, users can now easily format and process their data by connecting and accessing the API provided by Wiki. To check the semantic of words, word similarity matching is used to check whether two words are matched. For example, the words dog and cat should match to 70% similar as both cat and dog share certain similarities (e.g., four legs, mammal, tail, pet).

Several state-of-the-art word similarities techniques have been developed. They are all efficient methods but with differences in implementation. In general, semantic matching of words is categorized into four categories. The first category measures the similarity of words using two terms (concepts) which serves as function of the length of the path between the terms and the position of the terms in the taxonomy (Rada, Mili, Bicknell, & Blettner, 1989), (Wu & Palmer, 1994). In the second category, the similarity checking is carried out by checking the difference in information content of the two terms using a probabilistic function (Leacock & Martin, 1998), (Lord, Stevens, Brass, & CA, 2003). For this group, they use lexical database for English WordNet (Fellbaum, 1998) (several other ontology tools exist such as CYC[1], DO LCE[2], YAGO[3], Euro WordNet[4]) to calculate the probabilistic function. For the third category, similarity of words is measured using the two terms as a function of their properties (e.g., gloss overlap) or based on their relationship with other similar terms in the taxonomy. Finally, the last category uses the combination of the methods mentioned earlier (hybrid) (Rodriguez & Egenhofer, 2003) for similarity checking. Some of the state-of-the-art algorithms are developed by Jiang and Conrath (1997), Hirst and St-Onge (1998), and Leacock and Chodorow (Leacock & Martin, 1998). A survey (Budanitsky & Hirst, 2001) was carried out to evaluate the effectiveness of these algorithms. This survey shows that the algorithm of Jiang and Conrath performs better than other existing algorithms for matching two words.

22.3 Proposed Methodology

22.3.1 Overview

First, we develop a parser to parse through the HTML Web pages generated by the server side scripts. The parser detects the HTML file and divides the content into two types: the tag and the text tokens. The parser then constructs a tree structure

[1](2010). [Online]. Available: http://www.cyc.com
[2](2010). [Online]. Available: http://www.loa-cnr.it/DOLCE.html
[3](2010). [Online]. Available: http://www.ontologyportal.org/
[4](2010). [Online]. Available: http://www.illc.uva.nl/EuroWordNet/

based on the tag tokens. We called this tree as DOM Tree. It is assumed that the HTML page is well formed. For those Web pages which are not well formed, we discard it from our evaluation. Then, the parser traverses through the DOM Tree in depth first manner. Once the parser detects the text token, it will then go through the next stage of operation where tagging is done using semantics from Wikipedia.

22.3.2 Semantic Tagging

Once the text token is identified, we tokenize the text into words. For every word in the text token, we match them against our pool of predefined words in the database. If a match is encountered, we tag them and generate a script code such that a pop-up menu with the word definition can be displayed. However, not every word exists as an entity. For example, the two words "German Shepherd" are one entity; as such they should be matched as one entity instead of individually as two words. To match words that exist in single entity, we apply Adapted Lesk Algorithm (Banerjee, 2003), which is a technique used for word disambiguation. Adapted Lesk Algorithm works by checking the neighboring words and then apply a word similarity matching. For example, the sentences "Interest in book" and "Interest in bank" have neighboring words "book" and "bank" which are entirely dissimilar, hence they should be considered as dissimilar.

22.3.3 Scripts for Tagging

We use a simple JavaScript pop-up menu for tagging keywords. This pop-up menu is adaptable across various settings, which include languages, colors, and boundary sizes. The scripts used for our pop-up menu are taken from http://www.javascriptsource.com/navigation/popup-menu.html. The scripplets for the menu is as follows:

```
<HEAD>
<script type="text/javascript">
<!--
var ie  = document.all
var ns6 = document.getElementById&&!document.all
var isMenu  = false ;
var menuSelObj = null ;
var overpopupmenu = false;
function mouseSelect(e)
{
 var obj = ns6 ? e.target.parentNode : event.srcElement.parentElement;
 if( isMenu )
 {
  if( overpopupmenu == false )
  {
   isMenu = false ; overpopupmenu = false;
   document.getElementById('menudiv').style.display = "none" ;
   return true ;
  }
  return true ;
 }
 return false;
}
// POP UP MENU
function  ItemSelMenu(e)
{
 var obj = ns6 ? e.target.parentNode : event.srcElement.parentElement;
    menuSelObj = obj ;
 if (ns6)
 {
  document.getElementById('menudiv').style.left
e.clientX+document.body.scrollLeft;
  document.getElementById('menudiv').style.top
e.clientY+document.body.scrollTop;
 } else
 {
  document.getElementById('menudiv').style.pixelLeft
event.clientX+document.body.scrollLeft;
  document.getElementById('menudiv').style.pixelTop
event.clientY+document.body.scrollTop;
 }
 document.getElementById('menudiv').style.display = "";
```

```
  document.getElementById('item1').style.backgroundColor='#FFFFFF';
  document.getElementById('item2').style.backgroundColor='#FFFFFF';
  document.getElementById('item3').style.backgroundColor='#FFFFFF';
  document.getElementById('item4').style.backgroundColor='#FFFFFF';
  isMenu = true;
  return false ;
}
document.onmousedown = mouseSelect;
document.oncontextmenu = ItemSelMenu;
//-->
</script>
</HEAD>

<BODY>

<div id="menudiv" style="position:absolute; display:none; top:0px; left:0px;z-
index:10000;" onmouseover="javascript:overpopupmenu=true;"
onmouseout="javascript:overpopupmenu=false;">
<table width=82 cellspacing=1 cellpadding=0 bgcolor=lightgray>
  <tr><td>
   <table width=80 cellspacing=0 cellpadding=0>
     <tr>
      <td id="item1" bgcolor="#FFFFFF" width="80" height="16"
onMouseOver="this.style.backgroundColor='#EFEFEF'"
onMouseOut="this.style.backgroundColor='#FFFFFF'"> <a href="#">Item
1</a></td>
     </tr>
     <tr>
      <td id="item2" bgcolor="#FFFFFF" width="80" height="16"
onMouseOver="this.style.backgroundColor='#EFEFEF'"
onMouseOut="this.style.backgroundColor='#FFFFFF'"> <a href="#">Item
2</a></td>
     </tr>
     <tr>
      <td id="item3" bgcolor="#FFFFFF" width="80" height="16"
onMouseOver="this.style.backgroundColor='#EFEFEF'"
onMouseOut="this.style.backgroundColor='#FFFFFF'"> <a href="#">Item
3</a></td>
     </tr>
     <tr>
      <td id="item4" bgcolor="#ffffff" width="80" height="16"
onMouseOver="this.style.backgroundColor='#EFEFEF'"
onMouseOut="this.style.backgroundColor='#FFFFFF'"> <a href="#">Item
```

```
4</a></td>
    </tr>


  </table>
 </td></tr>
</table>
</div>

<p><center>
<font face="arial, helvetica" size"-2">Free JavaScripts provided<br>
by <a href="http://javascriptsource.com">The JavaScript Source</a></font>
</center><p>
```

22.4 Experiments

We conduct a user study to evaluate the effectiveness of our system. A random users size of 20 are taken to evaluate our system on the user-friendliness and usability of our system. The demographic of our users are given in Tables 1 and 2.

As can be seen from (Tables 22.1 and 22.2), we choose users from diverse background with different skills and mindset. Preference was taken to select users who are IT savvy and in the age group of 20–30. Users are briefed on the online system and its functionalities. They are given a grace period of 2 h to use the system and give feedback on it. A survey form is given to them where an evaluation score of 1–5 is given for each particular features they evaluated.

Table 22.1 Users age group

Age range	Number
15–20	1
20–25	8
25–30	6
30–35	4
>35	1

Table 22.2 Skills set of users

Skills	Number
Engineering	4
Computing	8
Business	6
Others	2

Table 22.3 User-friendliness test

Rating	Number
Poor	0
Not satisfactory	1
Neutral	3
Satisfactory	14
Excellent	2

Table 22.4 Performance

Rating	Number
Poor	0
Not satisfactory	2
Neutral	4
Satisfactory	9
Excellent	5

Table 22.5 Learning experience

Rating	Number
Poor	0
Not satisfactory	2
Neutral	4
Satisfactory	10
Excellent	4

On the whole, users find our system to be user-friendly, and our system comes with an interactive GUI, together with easy-to-navigate menus (Table 22.3). Some of the users commented on the color and font size of the system, whereby a more appropriate color scheme can be used with an adjustable font size. The system is able to run effectively without any crash incident reported, neither a bug is detected (Table 22.4). Table 22.5 shows the learning experience of the users. As shown in the table, users generally learn new knowledge through the easy-to-navigate menus as well as the interactive interface. A few comments have been given by the users over the fixed navigation provided (e.g., the sequence of menus seems to be rather constant after navigating).

22.5 Conclusion

We develop a system where some of the Web contents can be tagged using semantic from Wikipedia. Semantic tagging is carried out to highlight the keywords which are hard to understand where the definition and the specific details are explained using pop-up menus. We evaluate the performance and usability of our system by conducting a user study. The user study shows that our system is highly effective in making the users understand the key concepts of certain keywords.

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Chapter 23
Supervised Educational Data Mining to Discover Students' Learning Process to Improve Students' Performance

Ching Chieh Kiu

Abstract Online learning has social impact on students. Some students might experience impoverished learning due to high social isolation, less face-to-face interaction, difficulty in performing teamwork activities, low understanding, and lack of concentration on learning activities. However, some students can thrive on online learning. Knowledge discovery from students' event logs generated from their online learning can help to understand their level of understanding and concentration on the learning subject. Subsequently, this knowledge can be used to predict students' academic performance on their final grade. This paper presents supervised educational data mining, namely J48 decision tree approach to classify students based on their learning process and activities extracted from event logs in online learning system to predict their final grade. The generated model can be used to offer helpful recommendations to improve students' learning process and academic performance, especially to students that experience impoverished learning, and it also allows instructors to provide appropriate feedbacks and advice to the students in a timely manner.

Keywords Online learning · Social impact · Educational data mining · Learning process

23.1 Introduction

The emergent of Web-based educational technologies changes the process of teaching and learning in higher learning institute. Web-based systems provide a materials-based educational experience to simulate online learning. Online learning has social impact on students, whereas it can impact and affect their learning process on learning activities. Because different students have a different learning style and process, some students can thrive on online learning environment, while other stu-

C.C. Kiu (✉)
School of Computing & IT, Taylors University, Subang Jaya, Malaysia
e-mail: chingchieh.kiu@taylors.edu.my

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Table 23.1 Comparison of social impact of online learning and traditional learning

Social impact	Online learning	Traditional learning
Social isolation	High	Low
Face-to-face interaction	Less	High
Teamwork activities	Difficult to perform	Easy to perform
Concentration	Low	High
Understanding	High	Medium

dents might experience impoverished learning due to the difficulty in understanding, lack of concentration on the learning activities, high social isolation, less face-to-face interaction, and difficulty in performing teamwork activities in online learning environment (Aragon, Johnson, & Shaik, 2002; Lynch, 1999; Wosnitza & Volet, 2005; Zhang, Zhou, Briggs, & Nunamaker, 2006). The social impact of online learning is summarized in Table 23.1.

Through Web-based education systems, a vast educational data that describe students' learning pattern, process, and activities (click stream, taking tests, reading, etc.) are collected. The discovered knowledge from educational data using educational data mining (EDM) can be used to understand social impact in students' learning process, such as their understanding and concentration level on the learning topics. It also provides helpful recommendations to improve students' academic performance.

According to Scheuer and McLaren (2012), EDM is applied on educational data to identify variety of problems in educational research and technology development as summarized below:

1. Scientific inquiry and system evaluation
2. Determining student model parameters
3. Informing domain models
4. Creating diagnosis models
5. Creating reports and alerts for instructors, students, and other stakeholders
6. Recommending resources and activities.

23.2 Related Works

EDM is the application of data mining for exploring educational data in order to understand how student responds to educational system and how their responses impact their learning (Kashyap & Chauhan, 2015). Zaiane and Luo (2001) exploited advanced data mining techniques to extract useful patterns from Web access logs. The discovered knowledge is used by instructors to evaluate and interpret online course activities of their students in order to assess the learning process and to measure effectiveness of Web course structure.

Mukala, Buijs, Leemans, and van der Aalst (2015) applied fuzzy miner to discover students' learning behavior to understand their performance. Their analysis indicated that students always watch videos in the recommended sequence and in batch performed better than students skipped videos or procrastinate in watching videos.

Al-Radaideh, Al-Shawakfa, and Al-Najjar (2006) used decision tree to generate classification rule to predict students' final grade in a course. Three different classification methods, namely ID3, C4.5, and the Naive Bayes, were applied to classify the data set collected from C++ course in Yarmouk University, Jordan, in the year 2005. The outcome indicated that ID3 decision tree model had better prediction than the C4.5 model and the Naive Bayes models.

Bhardwaj and Pal (2012) conducted Bayesian classification method on data set which consisted of 300 students from 5 different degree colleges conducting BCA (Bachelor of Computer Application) to predict students' performance. The study showed that academic performances of the students are not always depending on their own effort. The result discovered the factors such as students' grade in a senior secondary examination, living location, medium of teaching, mother's qualification, students' other habit, family annual income, and student's family status, which were highly correlated with the students' academic performance.

Other than fuzzy algorithm, decision tree approach, and Bayesian classification applied in educational data mining, k-mean clustering (Ayesha, Mustafa, Sattar, & Khan, 2010), and association rules (Merceron & Yacef, 2005; Minaei-Bidgoli, Kashy, Kortemeyer, & Punch, 2003; Wang, 2006) are also used to perform knowledge discovery on students' performance.

Comprised of the related works described above, we presented supervised EDM, namely J48 decision tree approach, to discover students' learning process from event logs. The event logs used in this demonstration is discussed in Sect. 23.3. Subsequently, Sect. 23.4 explains knowledge discovery from students' learning process, and Sect. 23.5 concludes the paper with future works.

23.3 Event Logs from Online Learning Activities

The event logs used as an example in this demonstration is a data set that contains the students' time series of activities during six sessions of laboratory sessions of the course of digital electronics (Siemens & Baker, 2012). The data set is collected by recording 115 subjects' activities through a logging application while learning with an educational simulator. The details of event logs are summarized in Table 23.2, and the exemplar of event logs is depicted in Table 23.3.

Table 23.2 Summary details of event logs

Number of instances	230,318
Number of students	115
Number of students attended final examination	62
Session 1 (4 topics)	77
Session 2 (6 topics)	82
Session 3 (4 topics)	87
Session 4 (5 topics)	99
Session 5 (4 topics)	91
Session 6 (6 topics)	66

Table 23.3 Sample of event logs data

Session	Student ID	Exercise	Activity	Start time	End time	…	Mouse movement	Keystroke
Student								
1	1	Es	Other	2.10.2014 11:25:33	2.10.2014 11:25:34	…	84	0
1	1	Es	Aulaweb	2.10.2014 11:25:35	2.10.2014 11:25:42	…	397	0
1	1	Es	Blank	2.10.2014 11:25:43	2.10.2014 11:25:43	…	59	0
…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…

Student ID	Session 2	Session 3	Session 4	Session 5	Session 6
Intermediate grade					
1	5.0	0.0	4.5	4.0	2.25
2	4.0	3.5	4.5	4.0	1.00
3	3.5	3.5	4.5	4.0	0.00
…	…	…	…	…	…
…	…	…	…	…	…

Student ID	ES 1.1 (2 points)	ES 1.2 (3 points)	ES 2.1 (2 points)	…	ES 6.2 (15 points)	Total (100 points)
Final grade						
1	2.00	3.00	1.00	…	13.00	94.5
2	2.00	3.00	2.00	…	0.00	44.0
4	2.00	3.00	1.00	…	5.00	30.0
…	…	…	…	…	…	…
…	…	…	…	…	…	…

23.4 Knowledge Discovery from Students' Learning Process

Weka (Hall, Frank, Holmes, Pfahringer, Reutemann, & Witten, 2009) data mining tool is used to mining the event logs: (1) to discover students' learning process and (2) to generate classification model using J48 decision tree algorithm to predict students' final grade performance. Data preprocessing and attribute selecting or filtering are applied before data visualization and data mining step.

23.4.1 Discover Students' Learning Process

Using Weka visualization panes, a student learning process can be summarized and aggregated as shown in Figs. 23.1 and 23.2. Through the process of data preprocessing and attribute selecting or filtering, the data set of students' learning process occurred in 6 sessions which consisted of 13 attributes (session, student_Id, exercise, activity, start_time, end_time, idle_time, mouse_wheel, mouse_wheel_click, mouse_click_left, mouse_click_right, mouse_movement, and keystroke) is eliminated to 3 attributes (session, exercise, and activity). Session attribute is converted from numeric to nominal category.

From Figs. 23.1 and 23.2, we can discover that the student only attended 5 sessions of the learning activities and absented in session 3. It also discovers the student only studied 3 topics out of 6 topics in session 6, meanwhile studied all topics in other sessions. The frequency of the student engagement in each session, exercise, and activity can be directly illustrated in Fig. 23.1; meanwhile, the detail information of each attribute can be illustrated in Fig. 23.2. The student frequency

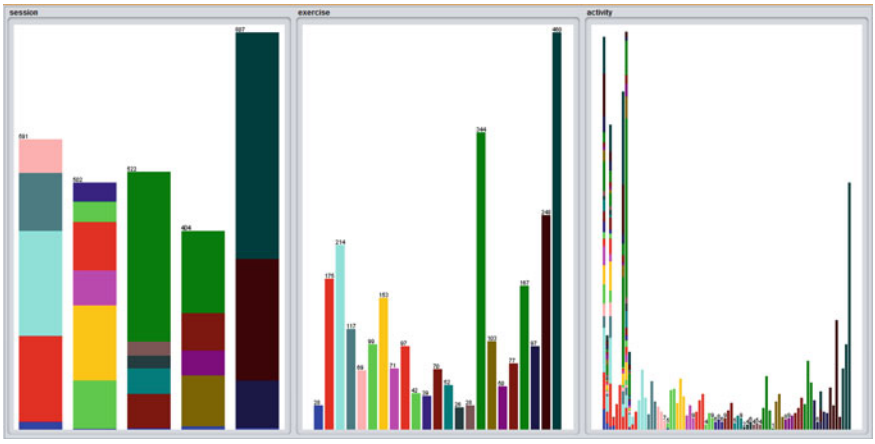

Fig. 23.1 Visualization of a student learning process

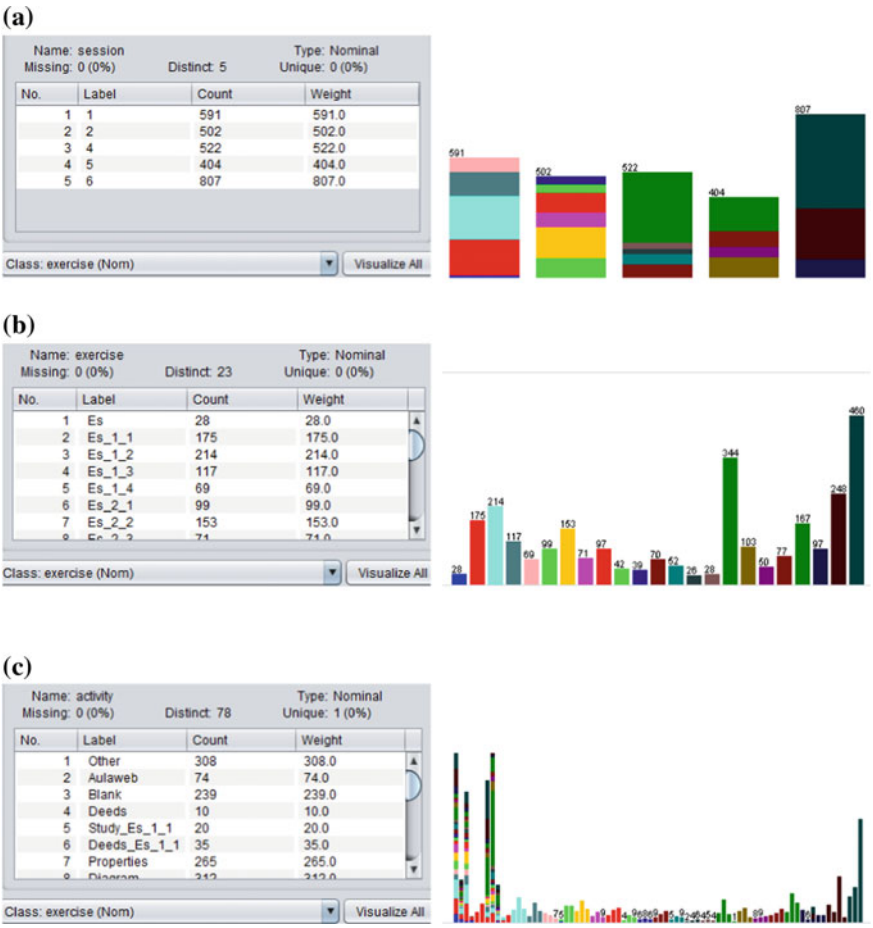

Fig. 23.2 Detail summarization of **a** session, **b** exercise, and **c** activity attributes

can be used to analyze and predict his level of understanding and concentration on his learning process. This discovered knowledge allows instructors to provide appropriate feedbacks and advice to the students in a timely manner during his learning process on the subject.

23.4.2 Classification Model to Predict Students' Performance

Supervised data mining, J48 decision tree algorithm (Drazin & Montag, 2012), is applied to mining the event logs to generate classification models to predict

students' final grade. In Weka, J48 decision tree is implemented using C4.5 decision tree algorithm. The algorithm used a divide and conquer approach to develop decision tree. Data preprocessing is applied before implementing J48 decision tree to classify the data. In the data preprocessing process, final grades are manually discretized into nominal attributes. Using training set is selected as a test option to generate classification models.

In this experiment, two classification models are generated as shown in Figs. 23.3 and 23.4, and their classification rules are, respectively, presented in Tables 23.4 and 23.5. From the classifier accuracy presented in Table 23.6, it is indicated that Model 2 is more precise to be used for predicting students' performance as it has higher precision value. However, as depicted in Table 23.6, the classifier accuracy of both models are useful for identifying students who are likely to fail based on students' learning activities in each learning session or based on students' achievement on their intermediate grades. Hence, proper feedbacks and advice are to be consulted to these students as to improve their result and academic performance. Overall, the generated models can offer helpful recommendations to improve students' learning process and academic performance.

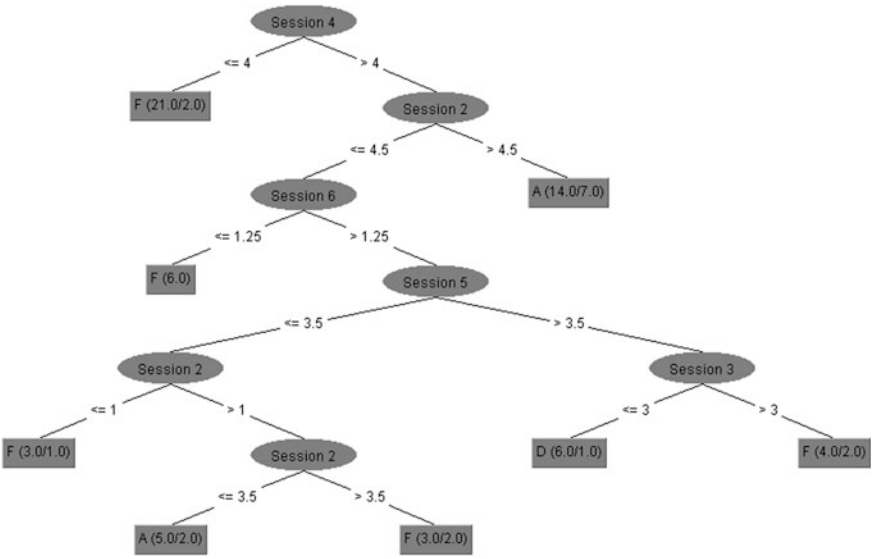

Fig. 23.3 Model 1: decision tree generated based on intermediate grades

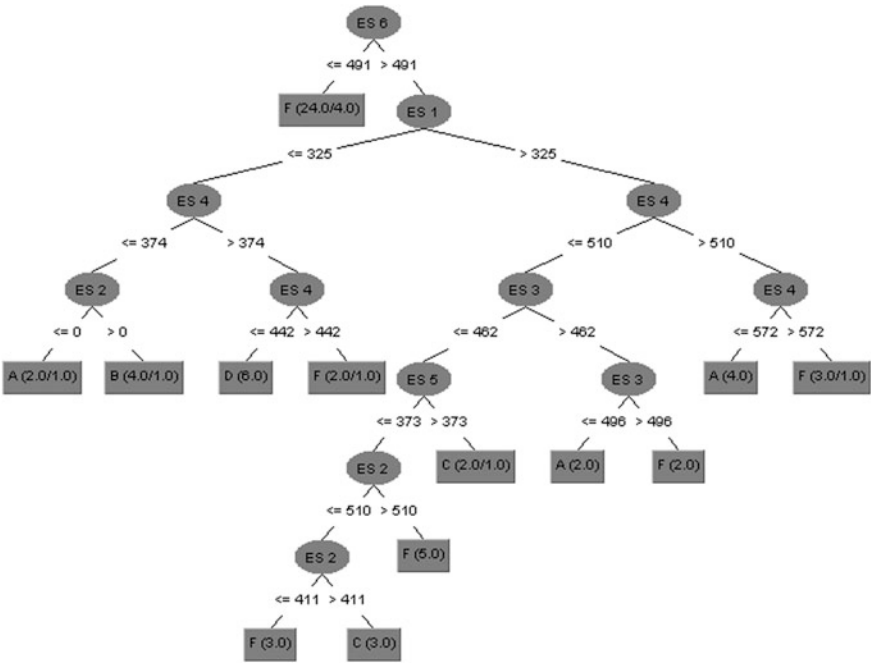

Fig. 23.4 Model 2: decision tree generated based on total activities of each session

Table 23.4 Generated classification rules of Model 1

```
Session 4 <= 4: F (21.0/2.0)
Session 4 > 4
|   Session 2 <= 4.5
|   |   Session 6 <= 1.25: F (6.0)
|   |   Session 6 > 1.25
|   |   |   Session 5 <= 3.5
|   |   |   |   Session 2 <= 1: F (3.0/1.0)
|   |   |   |   Session 2 > 1
|   |   |   |   |   Session 2 <= 3.5: A (5.0/2.0)
|   |   |   |   |   Session 2 > 3.5: F (3.0/2.0)
|   |   |   Session 5 > 3.5
|   |   |   |   Session 3 <= 3: D (6.0/1.0)
|   |   |   |   Session 3 > 3: F (4.0/2.0)
|   Session 2 > 4.5: A (14.0/7.0)
```

Table 23.5 Generated classification rules of Model 2

```
ES 6 <= 491: F (24.0/4.0)
ES 6 > 491
|   ES 1 <= 325
|   |   ES 4 <= 374
|   |   |   ES 2 <= 0: A (2.0/1.0)
|   |   |   ES 2 > 0: B (4.0/1.0)
|   |   ES 4 > 374
|   |   |   ES 4 <= 442: D (6.0)
|   |   |   ES 4 > 442: F (2.0/1.0)
|   ES 1 > 325
|   |   ES 4 <= 510
|   |   |   ES 3 <= 462
|   |   |   |   ES 5 <= 373
|   |   |   |   |   ES 2 <= 510
|   |   |   |   |   |   ES 2 <= 411: F (3.0)
|   |   |   |   |   |   ES 2 > 411: C (3.0)
|   |   |   |   |   ES 2 > 510: F (5.0)
|   |   |   |   ES 5 > 373: C (2.0/1.0)
|   |   |   ES 3 > 462
|   |   |   |   ES 3 <= 496: A (2.0)
|   |   |   |   ES 3 > 496: F (2.0)
|   |   ES 4 > 510
|   |   |   ES 4 <= 572: A (4.0)
|   |   |   ES 4 > 572: F (3.0/1.0)
```

Table 23.6 Accuracy of classification models

Model	Precision	Recall	F-measure
1	0.632	0.726	0.669
2	0.858	0.855	0.850

23.5 Conclusion and Future Work

In this paper, we have demonstrated that educational data mining tool, namely Weka, provides simple and effective visualization panes to discover students' learning process. Unsupervised educational data mining, J48 decision tree, produces classifier models and classification rules that are easy to interpret and understand. The experimental results also proved classifier models and classification rules generated by J48 decision tree are viable to predict students' performance. This has concluded that supervised education mining can be used to mining event logs and it provides a prediction model to predict students' learning process which can help to improve students' performance.

For future work, more experiments could be studied using different supervised educational data mining techniques and unsupervised data mining techniques. Finally, we will discover the most effective educational data mining technique in mining event logs to discover students' learning process for improving students' performance.

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Chapter 24
Effectiveness of the Integration of Tell Me More Courseware in the TOEIC Performance of College Students

Celia A. Tibayan

Abstract This study aimed at investigating the effectiveness of the integration of Tell Me More courseware in the Test of English for International Communication (TOEIC) performance of college students. A sample of 62 students from the College of Arts and Sciences (CAS) was chosen wherein their TOEIC pre-test scores during their second year in college and their TOEIC post-test scores during their fourth year were compared in relation with their final grade in the English course where Tell Me More courseware was integrated. Results show that majority of the students have Limited Working Proficiency with the score that ranges from 605 to 780 in their TOEIC pre- and post-tests. However, with the integration of Tell Me More courseware, there is a significant relationship among the TOEIC pre- and post-test scores and final grade in English. Results also reveal that Bachelor of Arts in Communication students have significantly higher reading scores in their post-test than the Bachelor of Arts in Multimedia Arts and Bachelor of Science in Psychology students. To conclude, Tell Me More courseware has a positive effect on the TOEIC performance of college students.

Keywords Tell me more courseware · TOEIC · Integration

24.1 Introduction

Much has been said about the benefits of integrating and using technology in teaching and learning. Šafranj (2013) in her study found out that information and communication technology (ICT) provided relevant improvements in language teaching; demonstrated positive effect on students' performance (Al-Mansour & Al-Shorman, 2011); contributed positive impact to the students (Hashim and Yunus, 2012); helped students in improving their proficiency in the English language (Yunus, Hashim, Embi, & Aqsha Lubis, 2010); helped students in achieving

C.A. Tibayan (✉)
Lyceum of the Philippines University-Laguna, 4027 Calamba City, Philippines
e-mail: celia.tibayan@lpulaguna.edu.ph

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better learning (Kagaoan Tibayan, Muya, & Tenorio, 2012); and brought positive effect on the achievements of students in science and technology course (Byarak & Bayram, 2010). Furthermore, Dunkel (1990) in Ahmad (2012) stressed the potentials of ICT in increasing learners' self-confidence, language proficiency, and overall academic skills. Technology also increased learners' enthusiasm making learning exciting.

The use of technology in teaching is called Computer-Assisted Language Learning (CALL). Al-Mansour and Al-Shorman (2011) defines CALL as an "approach to teaching and learning foreign language where the computer and computer-based resources such as the Internet are used to present, reinforce, and assess material to be learned." CALL is meant to enhance traditional language instruction. Ghasemi, Hashemi, and Bardine (2011) classified CALL as either communicative or integrative. Communicative CALL provides a non-drill skill practice wherein computers are used as tools while the target language is fully used. Integrative CALL, on the other hand, refers to the use of multimedia computers and the Internet. These can be in the form of text, graphics, sound, animation, and video to be accessed on a computer which can be either multimedia CALL (CD-ROMS) or Web-based CALL (on the Internet).

One of the examples of CALL is Tell Me More. Tell Me More courseware, according to a Web site, is language software which concentrates on four macro-skills: reading, writing, listening, and speaking with over 750 h of material. It has major features such as videos, recordings, and speech recognition. The objective of Tell Me More is "to provide language learners with a wide range of tools to address speaking, listening, vocabulary, grammar, sentence-level writing, and cultural awareness."

A study of Hashim and Yunus (2012) found out that the activities provided in Tell Me More courseware are "quite fun and suitable for the culture and background knowledge of the students." The same study also revealed that the English language lecturer believed that the students "got enough practice in the courseware because there were a lot of activities provided such as communication practices, pronunciation, and crossword puzzle." The courseware also meets the level of the students' proficiency because the levels of difficulty range from "beginner" to "advanced." Hence, the courseware matches students' level of proficiency and motivation in learning the language.

Many studies indicate that CALL provides an advanced and effective support for language teachers (Warshauer & Healey, 1998; cited in Al-Mansour and Al-Shorman, 2011). Many studies also affirm that there was an increase in the use of technology and its integration in teaching (Stepp-Greany, 2002). Hence, the researcher aims at investigating the effect of the integration of Tell Me More to the English proficiency scores of college students specifically in the Test of English in International Communication (TOEIC).

Specifically, this study aimed to achieve the following:

1. What is the TOEIC performance of students in their pre-test and post-test?

2. Is there a significant difference between the pre-test and post-test scores in terms of reading and listening?
3. Is there a significant relationship among the pre-test, post-test, and final grade in English with Tell Me More integration?
4. Is there a significant difference in the TOEIC performance among the programs in terms of their listening and reading scores and final grade in the English course?

24.2 Methodology

Using descriptive design, this study surveyed a total of 62 students from the College of Arts and Sciences (CAS) of Lyceum of the Philippines University-Laguna as samples of the study. CAS offers Bachelor of Arts in Communication (ABComm), Bachelor of Arts in Multimedia Arts (ABMMA), and Bachelor of Science in Psychology (BS Psychology). AB Communication students are trained to gain knowledge and skills for media practice in journalism, broadcasting, corporate communication, advertising, and development communication. ABMMA students, on the other hand, are trained to gain knowledge and skills in the use of multimedia through creative and innovative imagination. Lastly, BS Psychology students were trained to develop practical skills in predicting and influencing human behavior.

Nineteen (19) of the respondents were male, while 43 were female. A total of 26 respondents were students of ABComm, 25 from ABMMA, and 11 from BS Psychology.

Lyceum of the Philippines-Laguna, in response to the demands of the industry, has its English program wherein students in their second year in college will take the TOEIC test, as a pre-test of their English proficiency, then on the next semester, after taking the pre-test, they will take English 3, Speech and Oral Communication course, wherein Tell Me More courseware was integrated. The integration serves as the intervention program to further increase the students' TOEIC scores in their fourth year and to further improve their English proficiency in preparation for future employment after graduation. The integration of the courseware was tailored with the course syllabus wherein topics are matched with the Tell Me More activities. In a laboratory setup, each unit of personal computer (PC) has its own software installed where students are interacting using headsets and microphones. This serves as an enhancement of classroom lecture.

In this study, TOEIC pre- and post-test scores of students were gathered as well as their final grade in English 3. Statistical tools such as weighted mean, standard deviation, Pearson correlation, and analysis of variance (ANOVA) were used to interpret the gathered data.

24.3 Results and Discussion

Findings revealed that most of the respondents in their TOEIC pre-test and post-test are in the level of Limited Working Proficiency. In this level, students were "able to satisfy most social demands and limited work requirements" (Table 24.1).

Results show that there is no significant difference between the TOEIC listening scores of students in the pre-test and post-test. Results reveal that the integration of Tell Me More courseware with the English course did not contribute much in developing the listening skills of students. However, results show that the mean score in the post-test increased by 10.64 (Table 24.2).

Table 24.3 shows that there is a significant difference between TOEIC reading scores of students in the pre-test and post-test. This suggests that the integration of Tell Me More courseware with the English course helped enhance the reading comprehension skills of students. Results show that the mean score increased by 18.47 in reading post-test.

Results reveal that there is a significant relationship among the TOEIC listening and reading pre-test and post-test scores and the final grade in the English course with Tell Me More integration. This shows that TOEIC post-test scores are significantly related to the final grade in the English course. It means that the integration of courseware, as revealed in the final grade in ENG3, contributed for the improvement of the post-test scores in TOEIC (Table 24.4).

Table 24.5 shows the comparative analysis of scores in listening and reading in the pre-test and post-test and the English final grade of students. Results show that

Table 24.1 Performance of students in the TOEIC pre-test and post-test

Score level	General description	Pre-test	Post-test
905–990	*International professional proficiency* Able to communicate effectively in any situation	6	10
785–900	*Working proficiency plus* Able to satisfy most work requirements with language that is often, but not always, acceptable and effective	16	17
605–780	*Limited working proficiency* Able to satisfy most social demands and limited work requirements	30	26
405–600	*Elementary proficiency plus* Can initiate and maintain predictable face-to-face conversations and satisfy limited social demands	9	9
255–400	*Elementary proficiency* Speaker has functional, but limited proficiency. Able to maintain very simple face-to-face conversations on familiar topics	1	0
10–250	*Basic proficiency* Able to satisfy immediate survival needs	0	0

*Score Level and General Description based on TOEIC® Scores and Conversion Table

Table 24.2 Comparative analysis of TOEIC listening scores in the pre-test and post-test

Listening test	Mean	Std. deviation	Sig. (2-tailed)	Interpretation
Pre-test	384.76	61.55	0.056	Not significant
Post-test	395.40	64.50		

Table 24.3 Comparative analysis of TOEIC reading scores in the pre-test and post-test

Reading test	Mean	Std. deviation	Sig. (2-tailed)	Interpretation
Reading pre-test	344.92	79.86	0.000	Significant
Reading post-test	363.39	78.46		

Table 24.4 Relationship between the TOEIC pre-test and post-test and English final grade

		English final grade	Listening pre-test	Reading pre-test	Listening post-test
Listening post-test	Pearson Correlation	0.385**	0.768**	0.754**	
	Sig. (2-tailed)	0.002	0	0	
Reading post-test	Pearson Correlation	0.527**	0.724**	0.890**	0.726**
	Sig. (2-tailed)	0	0	0	0

***Significant*

Table 24.5 Comparative analysis of scores in listening and reading in the pre-test and post-test and the English final grade

Program		Listening pre-test	Reading pre-test	Listening post-test	Reading post-test	English final grade
ABComm	Mean	392.31	361.92	393.46	391.92	90.37
	SD	40.06	59.26	60.15	62.13	4.09
ABMMA	Mean	371.40	324.40	386.40	331.00	89.58
	SD	75.28	84.49	64.28	75.35	3.11
PSYCH	Mean	397.27	351.36	420.45	369.55	92.54
	SD	68.75	105.57	74.24	97.45	4.37
	t-value	1.012	1.473	1.088	4.304	2.358
	Sig	0.370	0.238	0.343	0.018*	0.104

Legend *Significant at 5%

in terms of listening pre- and post-tests, BS Psychology students scored higher among all programs while in terms of the reading pre- and post-tests, AB Communication students scored higher. This indicates that BS Psychology students marked a significant improvement in their TOEIC listening post-test while AB

Communication students obtained significant improvement in their TOEIC reading post-tests.

In terms of the final grade in the English course, BS Psychology students scored higher among all programs. Moreover, results reveal that among the three programs, AB Communication students have significantly higher reading score in the post-test test with a p value of 0.018. This shows that AB Communication students obtained the highest improvement in their TOEIC reading scores.

24.4 Conclusion

This study aimed at investigating the effectiveness of the integration of Tell Me More courseware in the TOEIC performance of students. Specifically, it looked into the TOEIC performance of students in their pre-test and post-test and the relationship of the final grade in the English course with their TOEIC performance. Based on the results, most of the respondents, in their TOEIC pre-test and post-test, are in the level of Limited Working Proficiency. It was also found that there is no significant difference between the TOEIC listening scores of students in the pre-test and post-test while in terms of the TOEIC reading score, there is a significant difference. Moreover, results reveal that there is a significant relationship among the TOEIC listening and reading pre-test and post-test scores and the final grade in the English course with Tell Me More integration. This suggests that TOEIC scores are significantly related to the final grade in the English course. Lastly, results show that in terms of listening in the pre- and post-test, BS Psychology students scored higher among all programs while in terms of reading in the pre- and post-test, AB Communication students scored higher. Results of final grade in the English course reveal that BS Psychology students scored higher among all programs. Moreover, results reveal AB Communication students have significantly higher reading score in the post-test among the three programs.

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Chapter 25
Appropriate Use of Technology: How Useful Are Calculations of Discrimination Index by Optical Mark Readers in Item Analysis of Single Best Answer MCQ Tests with Small Student Numbers?

Benjamin Samraj Prakash Earnest, Prabal Bhargava, Anitha Ponnupillai, Suresh Ponnusamy, Nurjahan Mohd. Ibrahim and Roland Gamini Sirisinghe

Abstract Recent advances in computer-related technology and the availability of technology to everyone at affordable cost have made it possible to use such technology in every aspect of teaching-learning. Educational institutions are increasingly using optical mark readers (OMRs) which also feature software that calculates difficulty index and discrimination index in addition to correcting hundreds of OMR mark sheets in a matter of seconds to minutes which would otherwise take many man-hours. We explore how useful the calculations of discrimination index by optical mark readers are in item analysis of single best answer MCQ tests with small student numbers.

Keywords Optical mark reader · Discrimination index · Item analysis

B.S.P. Earnest (✉) · P. Bhargava · A. Ponnupillai · S. Ponnusamy · N.M. Ibrahim · R.G. Sirisinghe
Taylor's University School of Medicine, 47000 Sungai Buloh, Selangor, Malaysia
e-mail: BenjaminSamrajPrakash.Earnest@taylors.edu.my

P. Bhargava
e-mail: Prabal.Bhargava@taylors.edu.my

A. Ponnupillai
e-mail: Anitha.Ponnupillai@taylors.edu.my

S. Ponnusamy
e-mail: Suresh.Ponnusamy@taylors.edu.my

N.M. Ibrahim
e-mail: nurjahan.ibrahim@taylors.edu.my

R.G. Sirisinghe
e-mail: RolandGamini.Sirisinghe@taylors.edu.my

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25.1 Introduction

The single best answer multiple-choice questions (SBA-MCQ) is found to be better suited to the assessment of the higher levels of knowledge essential for clinical practice such as analysis, data interpretation, problem-solving and decision-making than other forms of testing like traditional true/false MCQ. Optical mark reading (or optical mark recognition, OMR) has drastically changed the way SBA-MCQs are corrected. OMR has relieved teachers from the drudgery of correcting SBA-MCQs by using scanning technology and a built-in software for efficiently correcting hundreds of MCQs within minutes. What is more? The built-in software also analyses the SBA-MCQs corrected and provides us with values for difficulty index (DI) and discrimination index (DsI) along with the students' test marks.

25.2 History

Modern optical mark recognition (OMR) is the scanning of a mark sheet to detect the presence or absence of a mark (made by the examinee) in a predetermined position and scoring the mark sheet (often called OMR sheet) using computer software. Apart from evaluation and assessment, the same technology is also used for data compilation, product evaluation, time sheets and inventory counts. The first successful optical mark-sense scanner was developed in 1962 by Everett Franklin Lindquist in the USA.

Benjamin D. Wood, an American educator, researcher and pioneer in learning technologies, is credited with the introduction of multiple-choice questions early in twentieth century. He also collaborated with IBM as early as 1929 to develop a mechanical device to score multiple-choice questions developing various devices for the purpose.

Discrimination index (Matlock-Hetzel, 1997) is an important component of item analysis, the basis for which the classical test theory originally put forth by Novic (1966).

25.3 Context

Single best answer MCQ tests (SBA-MCQ tests) are commonly used to examine students' knowledge of the subject taught (cognitive domain). In medical schools, case scenario-based SBA-MCQ tests are widely used to evaluate complex cognitive processes such as analysis, synthesis and evaluation. Item analysis using difficulty index (DfI, proportion of total number of students selecting the correct answer to the total number of students taking the test) and discrimination index (DsI, proportion of the difference between the total number of students selecting the correct

answer in the top and bottom 27% to the number of students in either group) is done to assess question validity.

25.4 Objective

To explore the suitability of using discriminative index as a measure of question validity in item analysis of single best answer MCQ tests with small student numbers.

25.5 Methods

This study was set in Taylor's University, Clinical School, Sungai Buloh, Malaysia. The student population was 4 groups of 3rd- and 4th-year medical students in Internal Medicine, Ophthalmology and Obstetrics & Gynaecology postings. The student groups ranged from 11 to 16 students each. Each group underwent a SBA-MCQ test with 20–30 items each at the end of their respective postings. Optical mark reader (OMR) was used to score the test results. The OMR also uses software to produce DfI and DsI of each question in the SBA-MCQ test. We also used a spreadsheet (MS Excel) to further analyse the results using DsI calculated by 4–6 different methods described in the literature.

In computing, the discrimination index, DsI, first order by rank the students' test scores. From this the top, 27% of the students and the bottom 27% are compared in DsI **(Method 1)**. The 27% is used because it has been shown that this value will maximize differences in normal distributions while providing enough cases for analysis (Wiersma & Jurs, 1990). There need to be as many students as possible in each group to promote stability; at the same time, it is desirable to have the two groups be as different as possible to make the discriminations clearer. Most educationists agree with this grouping (Popham, 1981). However, others have suggested using 25% (Beuchert & Mendoza, 1979; Englehart, 1965; Nunnally, 1972; Zaiontz, 2016). Still others have indicated that top and bottom 33% **(Method 2)** or even 50% **(Method 3)** could be used (Beuchert & Mendoza, 1979; Englehart, 1965; Liu, 2008; Pareek 2007; Zaiontz, 2016). But increasing the percentage will only add more number of "average" students to either group. So they may not really be representative of "top" and "bottom" groups.

The discrimination index, DsI, is the number of people in the upper group who answered the item correctly minus the number of people in the lower group who answered the item correctly, divided by the number of people in the larger of the two groups. The groups may be unequal when the students' number may not exactly make up 27% or 33% of the top/bottom groups. For example, in a class of 50 students 27% is 13.5 students. So, we can add 14 students to one group and 13 students to another group to balance out and divide by 14 which is the larger of

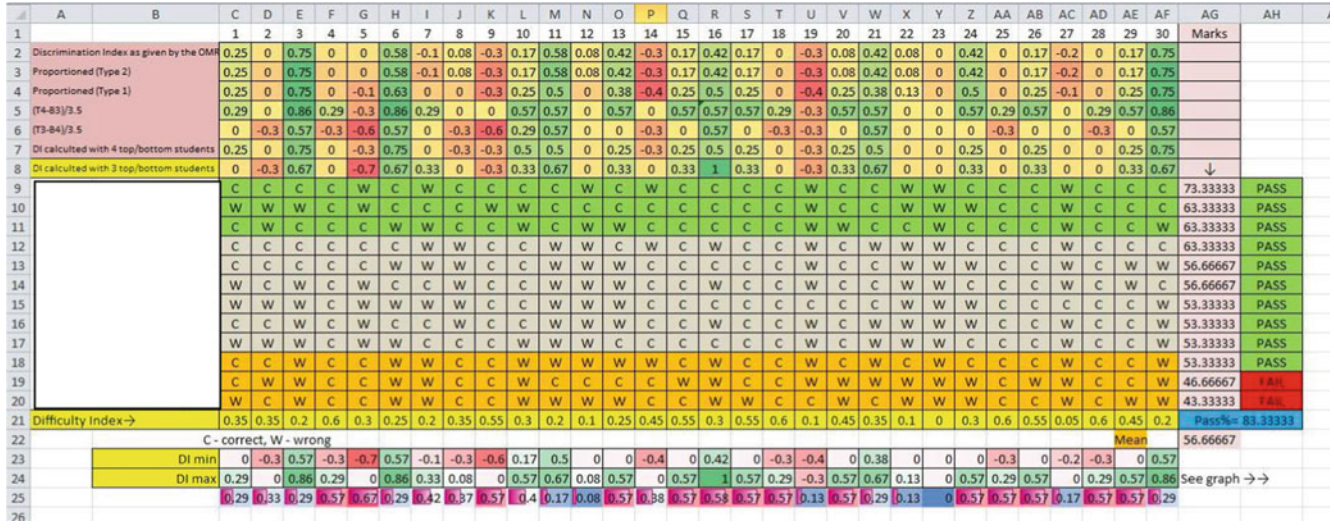
the 2 groups. Some have argued that in such situations we should divide by 13.5 and not 14 as this would greatly reduce the impact of the smaller group to the final value of DsI (Shannon & Cliver, 1987). We can add an additional student to either the top group **(Method A)** or the bottom group **(Method B)**. Alternatively, we can round it off to the nearest whole number and keep the groups the same **(Method C)**. It may be better to use Method C if the decimal is too high (say >0.7) or too low (say <0.3).

Another situation where the groups could be unequal is when students at the fringe of the groups score the same marks. For example, in the above group of 50 students, let us say the 13th student in the top group has the same score as the 14th, 15th and 16th students, then we have an unequal grouping with 16 students in the top group and 14 students in the bottom group. In such instances, dividing both groups with 16 would greatly reduce the impact of the smaller group to the DsI value. So there are at least 2 other ways to resolve this issue. Firstly, we can proportionately reduce the number of correct answers (n) out of 16 to 14 by $14n/16$ **(Method i)**. Secondly, we can proportionately reduce the number of correct answers (n) out of 4 (13th–16th students = 4 students) to 2 (to make up for the 13th and 14th student) by $2n/4$ **(Method ii)**. The latter option would be better since if we use the first method we would be diluting the impact of the top students (1–12th students) by adding 13th–16th students. In the first method, correct responses of top 12 students are reduced to 12/16th of its value, while 13–16th students who are more likely to be average than "top" students get 4/16th of its value. In the second method, correct responses of top 12 students are reduced to 12/14th of its value, while 13–16th students who are more likely to be "average" than "top" students get 2/14th of its value. Methods i and ii are applicable only when students at the fringe of the groups score the same marks.

25.6 Results

A total of 110 SBA-MCQs were analysed (Figs. 25.1, 25.2, 25.3 and 25.4). DsI calculated by different methods described above (Methods 1–6) were tabulated, and the maximum DsI (DsI max) and minimum DsI (DsI min) values were identified. The difference between the maximum DsI and minimum DsI was calculated and found to be >0.3 for many questions (63/110, 57.3%) and >0.5 in some (30/110, 27.3%).

These variations in DsI calculated by different methods were found to be related to the small student numbers particularly when many students score the same marks in the test. We found that the OMR used 33% of top and bottom students (Method 2) to calculate DsI and resolved multiplicity of fringe marks by Method ii described above. OMR with operator selectable options to change such settings would be more useful in this regard.



		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Marks	
Discrimination Index as given by the OMR		0.25	0	0.75	0	0	0.58	-0.1	0.08	-0.3	0.17	0.58	0.08	0.42	-0.3	0.17	0.42	0.17	0	-0.3	0.08	0.42	0.08	0	0.42	0	0.17	-0.2	0	0.17	0.75		
Proportioned (Type 2)		0.25	0	0.75	0	0	0.58	-0.1	0.08	-0.3	0.17	0.58	0.08	0.42	-0.3	0.17	0.42	0.17	0	-0.3	0.08	0.42	0.08	0	0.42	0	0.17	-0.2	0	0.17	0.75		
Proportioned (Type 1)		0.25	0	0.75	0	-0.1	0.63	0	0	-0.3	0.25	0.5	0	0.38	-0.4	0.25	0.5	0.25	0	-0.4	0.25	0.38	0.13	0	0.5	0	0.25	-0.1	0	0.25	0.75		
(T4-B3)/3.5		0.29	0	0.86	0.29	-0.3	0.86	0.29	0	0	0.57	0.57	0	0.57	0	0.57	0.57	0.57	0.29	-0.3	0.57	0.57	0	0	0.57	0.29	0.57	0	0.29	0.57	0.86		
(T3-B4)/3.5		0	-0.3	0.57	-0.3	-0.6	0.57	0	-0.3	-0.6	0.29	0.57	0	0	-0.3	0	0.57	0	-0.3	-0.3	0	0.57	0	0	0	-0.3	0	0	-0.3	0	0.57		
DI calculted with 4 top/bottom students		0.25	0	0.75	0	-0.3	0.75	0	-0.3	-0.3	0.5	0.5	0	0.25	-0.3	0.25	0.5	0.25	0	-0.3	0.25	0.5	0	0	0.25	0	0.25	0	0	0.25	0.75		
DI calculted with 3 top/bottom students		0	-0.3	0.67	0	-0.7	0.67	0.33	0	-0.3	0.33	0.67	0	0.33	0	0.33	1	0.33	0	-0.3	0.33	0.67	0	0	0.33	0	0.33	0	0	0.33	0.67	↓	
		C	C	C	C	W	C	W	C	C	C	C	W	C	W	C	C	C	C	W	C	C	W	W	C	C	C	W	C	C	C	73.33333	PASS
		W	W	W	C	W	C	C	C	W	W	C	C	C	C	C	C	C	C	W	C	C	W	W	W	C	C	W	C	C	C	63.33333	PASS
		C	W	C	C	C	W	W	C	C	W	C	W	W	C	C	C	C	C	W	W	C	C	W	C	C	C	W	C	C	W	63.33333	PASS
		C	C	C	C	C	C	W	W	C	C	W	W	C	W	C	W	C	C	W	C	W	W	W	C	C	C	W	C	C	C	63.33333	PASS
		C	C	C	C	C	W	W	W	C	C	W	W	W	C	C	C	C	C	W	C	C	W	W	W	C	C	W	C	W	W	56.66667	PASS
		W	C	W	C	W	C	C	W	C	C	W	W	W	C	C	W	C	C	W	C	C	W	W	C	C	C	W	C	W	C	56.66667	PASS
		W	W	W	C	W	W	W	W	C	C	W	W	W	C	C	C	C	C	C	C	C	W	W	W	C	C	C	C	C	W	53.33333	PASS
		C	C	W	C	C	W	W	C	C	W	W	W	W	C	C	W	C	C	W	C	W	C	W	C	C	C	W	C	C	W	53.33333	PASS
		W	W	W	C	W	W	C	C	C	W	W	W	C	C	C	C	C	C	W	C	W	W	W	C	C	C	W	C	C	W	53.33333	PASS
		C	C	W	C	C	W	W	C	C	W	W	W	W	W	C	W	C	C	W	C	W	C	W	C	C	C	W	C	C	W	53.33333	PASS
		C	W	W	C	C	W	W	C	C	W	C	C	C	C	W	W	C	C	W	C	W	W	W	W	C	W	W	C	C	W	46.66667	FAIL
		W	C	W	C	C	W	W	C	C	W	W	W	W	C	C	W	W	C	C	W	C	W	W	W	C	C	W	C	W	W	43.33333	FAIL
Difficulty Index→		0.35	0.35	0.2	0.6	0.3	0.25	0.2	0.35	0.55	0.3	0.2	0.1	0.25	0.45	0.55	0.3	0.55	0.6	0.1	0.45	0.35	0.1	0	0.3	0.6	0.55	0.05	0.6	0.45	0.2	Pass%= 83.33333	
C - correct, W - wrong																														Mean		56.66667	
DI min		0	-0.3	0.57	-0.3	-0.7	0.57	-0.1	-0.3	-0.6	0.17	0.5	0	0	-0.4	0	0.42	0	-0.3	-0.4	0	0.38	0	0	0	-0.3	0	-0.2	-0.3	0	0.57		
DI max		0.29	0	0.86	0.29	0	0.86	0.33	0.08	0	0.57	0.67	0.08	0.57	0	0.57	1	0.57	0.29	-0.3	0.57	0.67	0.13	0	0.57	0.29	0.57	0	0.29	0.57	0.86	See graph →→	
		0.29	0.33	0.29	0.57	0.67	0.29	0.42	0.37	0.57	0.4	0.17	0.08	0.57	0.38	0.57	0.58	0.57	0.57	0.13	0.57	0.29	0.13	0	0.57	0.57	0.57	0.17	0.57	0.57	0.29		

Fig. 25.1 Item analysis in test 1

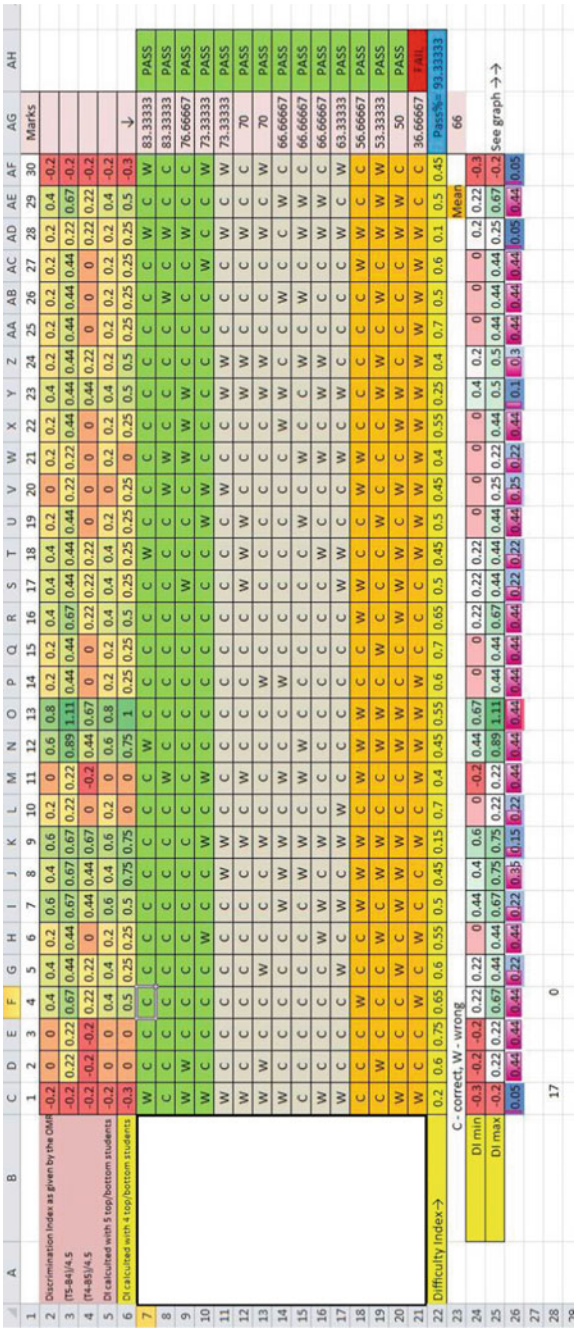


Fig. 25.2 Item analysis in test 2

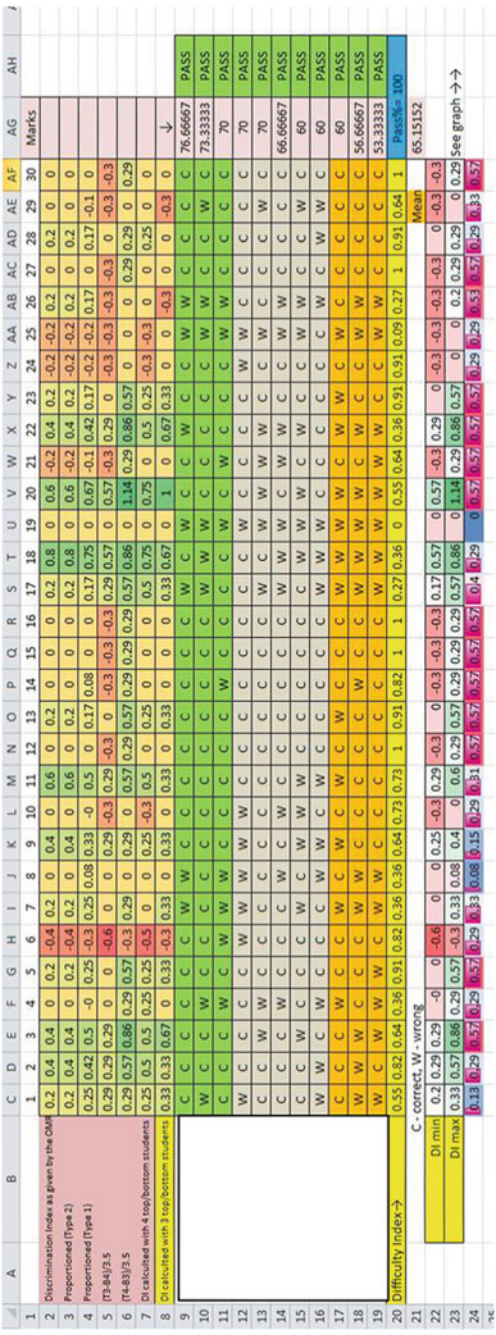
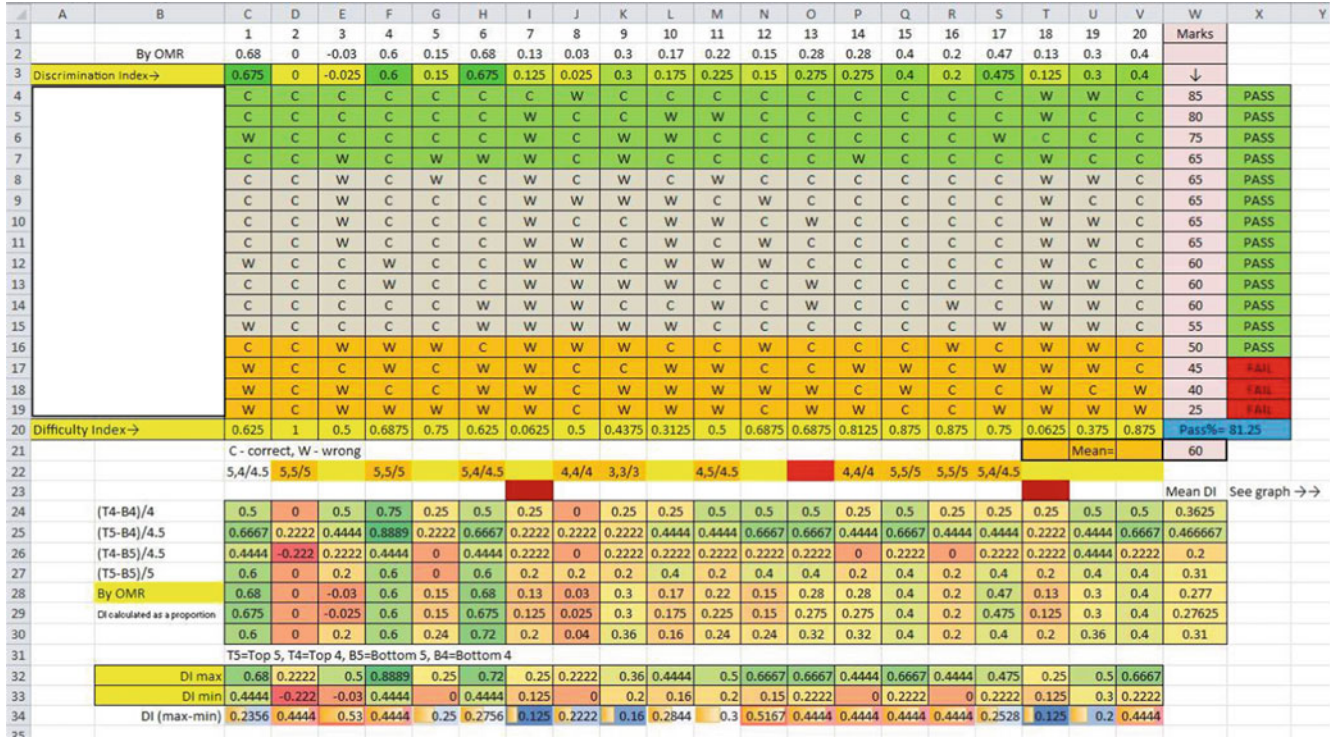


Fig. 25.3 Item analysis in test 3



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Marks	
2		By OMR	0.68	0	-0.03	0.6	0.15	0.68	0.13	0.03	0.3	0.17	0.22	0.15	0.28	0.28	0.4	0.2	0.47	0.13	0.3	0.4		
3	Discrimination Index→		0.675	0	-0.025	0.6	0.15	0.675	0.125	0.025	0.3	0.175	0.225	0.15	0.275	0.275	0.4	0.2	0.475	0.125	0.3	0.4	↓	
4			C	C	C	C	C	C	C	W	C	C	C	C	C	C	C	C	C	W	W	C	85	PASS
5			C	C	C	C	C	C	W	C	C	W	W	C	C	C	C	C	C	W	C	C	80	PASS
6			W	C	C	C	C	C	W	C	W	W	C	C	C	C	C	C	W	C	C	C	75	PASS
7			C	C	W	C	W	W	W	C	W	C	C	C	C	W	C	C	C	W	C	C	65	PASS
8			C	C	W	C	W	C	W	C	W	C	W	C	C	C	C	C	C	W	W	C	65	PASS
9			C	C	W	C	C	C	W	W	W	W	C	W	C	C	C	C	C	W	C	C	65	PASS
10			C	C	W	C	C	C	W	C	C	W	W	C	W	C	C	C	C	W	W	C	65	PASS
11			C	C	W	C	C	C	W	W	C	W	C	W	C	C	C	C	C	W	W	C	65	PASS
12			W	C	C	W	C	C	W	W	C	W	W	W	C	C	C	C	C	W	C	C	60	PASS
13			C	C	C	W	C	C	W	W	W	W	C	C	W	C	C	C	C	W	W	C	60	PASS
14			C	C	C	C	C	W	W	W	C	C	W	C	W	C	C	W	C	W	W	C	60	PASS
15			W	C	C	C	C	W	W	W	W	W	C	C	C	C	C	C	W	W	W	C	55	PASS
16			C	C	W	W	W	C	W	W	W	C	C	W	C	C	C	W	C	W	W	C	50	PASS
17			W	C	C	W	C	W	W	C	C	W	W	C	C	W	W	C	W	W	W	C	45	FAIL
18			W	C	W	C	C	W	W	C	W	W	W	W	W	C	W	C	C	W	C	W	40	FAIL
19			W	C	W	W	W	W	W	C	W	W	W	C	W	W	C	C	W	W	W	W	25	FAIL
20	Difficulty Index→		0.625	1	0.5	0.6875	0.75	0.625	0.0625	0.5	0.4375	0.3125	0.5	0.6875	0.6875	0.8125	0.875	0.875	0.75	0.0625	0.375	0.875	Pass%= 81.25	
21			C - correct, W - wrong																		Mean=		60	
22			5,4/4.5	5,5/5		5,5/5		5,4/4.5		4,4/4	3,3/3		4,5/4.5			4,4/4	5,5/5	5,5/5	5,4/4.5					
23																							Mean DI	See graph →→
24		(T4-B4)/4	0.5	0	0.5	0.75	0.25	0.5	0.25	0	0.25	0.25	0.5	0.5	0.5	0.25	0.5	0.25	0.25	0.25	0.5	0.5	0.3625	
25		(T5-B4)/4.5	0.6667	0.2222	0.4444	0.8889	0.2222	0.6667	0.2222	0.2222	0.2222	0.4444	0.4444	0.6667	0.6667	0.4444	0.6667	0.4444	0.4444	0.2222	0.4444	0.6667	0.466667	
26		(T4-B5)/4.5	0.4444	-0.222	0.2222	0.4444	0	0.4444	0.2222	0	0.2222	0.2222	0.2222	0.2222	0.2222	0	0.2222	0	0.2222	0.2222	0.4444	0.2222	0.2	
27		(T5-B5)/5	0.6	0	0.2	0.6	0	0.6	0.2	0.2	0.2	0.4	0.2	0.4	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.4	0.31	
28		By OMR	0.68	0	-0.03	0.6	0.15	0.68	0.13	0.03	0.3	0.17	0.22	0.15	0.28	0.28	0.4	0.2	0.47	0.13	0.3	0.4	0.277	
29		DI calculated as a proportion	0.675	0	-0.025	0.6	0.15	0.675	0.125	0.025	0.3	0.175	0.225	0.15	0.275	0.275	0.4	0.2	0.475	0.125	0.3	0.4	0.27625	
30			0.6	0	0.2	0.6	0.24	0.72	0.2	0.04	0.36	0.16	0.24	0.24	0.32	0.32	0.4	0.2	0.4	0.2	0.36	0.4	0.31	
31			T5=Top 5, T4=Top 4, B5=Bottom 5, B4=Bottom 4																					
32		DI max	0.68	0.2222	0.5	0.8889	0.25	0.72	0.25	0.2222	0.36	0.4444	0.5	0.6667	0.6667	0.4444	0.6667	0.4444	0.475	0.25	0.5	0.6667		
33		DI min	0.4444	-0.222	-0.03	0.4444	0	0.4444	0.125	0	0.2	0.16	0.2	0.15	0.2222	0	0.2222	0	0.2222	0.125	0.3	0.2222		
34		DI (max-min)	0.2356	0.4444	0.53	0.4444	0.25	0.2756	0.125	0.2222	0.16	0.2844	0.3	0.5167	0.4444	0.4444	0.4444	0.4444	0.2528	0.125	0.2	0.4444		

Fig. 25.4 Item analysis in test 4

25.7 Conclusion

The variation in the DsI calculated by different methods often placed the same question in different categories from "to be discarded" to "good". DsI should be used with caution in tests with small numbers. DsI values calculated by the OMR should be interpreted with caution in item analysis of single best answer MCQ tests with small student numbers as it represents only one way of calculating this value.

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Chapter 26
Undergraduate Students' Perceptions as Producer of Screencast Videos in Learning Mathematics

Irene Yang and Bee Theng Lau

Abstract In this digital age, universities shift their teaching and learning from conventional to blended learning utilizing various state-of-the-art digital technologies. Thus, online video-based teaching and learning have also gained its popularity among educators to facilitate the students' learning. However, little research has been conducted on learner-produced-videos-based approach. Therefore, this research investigates and designs an innovative student-centered learning approach through collaborative production of mathematics screencast videos. A survey was also conducted to understand the learners' perceptions in terms of benefits, challenges, motivation, sharing platform, and effectiveness of learning. This paper discusses the design, methodology, evaluation, and findings of the study conducted.

Keywords Screencast videos · Student-centered learning · Motivation · Undergraduate · Mathematics

26.1 Introduction

Learning paradigm nowadays has begun to transform from traditional to digital resources in higher education to prepare learners for twenty-first-century challenges. However, the potential of emerging technology to support learning remains a controversial issue. There are still some unclear issues such as benefits and challenges of digital-enhanced learning approach. Furthermore, it is also crucial to understand the impact of technology on students' interest in learning, collaborative learning with peers, and effectiveness of learning such as retention of knowledge. Therefore, educators need to develop and evaluate new strategies of

I. Yang (✉) · B.T. Lau
Swinburne University of Technology Sarawak Campus, Kuching, Malaysia
e-mail: iyang@swinburne.edu.my

B.T. Lau
e-mail: blau@swinburne.edu.my

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technology-based learning to achieve learning outcomes as well as to address the needs of learners with diverse background and content knowledge.

Watching screencast videos has recently become a promising alternative to face-to-face learning. Screencast video is a powerful tool to deliver learning content as learners could do self-directed learning by viewing videos at their own time, place, and pace (Falconer, Nicodemus, deGrazia, & Will Medlin 2012; Mullamphy Higgins, Belward, & Ward, 2010). The uploaded learning videos are available online, thus providing flexibility for learners to enjoy personalized learning via Internet connectivity. In addition, majority of the undergraduate students found the screencast videos helpful in their acquisition of deeper mathematical concepts and increase their achievement in the grades obtained for the course eventually (Green, Pinder-Grover, & Millunchick, 2012).

Despite prior studies revealed that student's favor the use of screencasts in learning, research on learners' perceptions in producing screencast videos as part of learning seems to be lacking and not been well investigated. Hence, this paper describes an approach to assess students' perceptions toward engaging learners as producer of screencast videos.

26.2 Literature Review

It is crucial to engage learners actively in the learning process. According to constructivist theory (Piaget, 1985), effective learning requires learners to build new understanding by applying their existing knowledge. When learners encounter inconsistency with their prior knowledge, they will need to modify their existing understanding to accommodate new learning experience. In this way, students could obtain knowledge by discovering concepts by themselves, and the learning will be more meaningful to them. Nowadays, educators face the challenge of transforming their role from teacher to facilitator, integrating technological learning environment to better engage students in constructivist learning approach.

In fact, appropriate level of interaction with peers plays an important role in learning. This interaction could be fostered through a social constructivist classroom setting that can stimulate collaboration among peers in knowledge construction. According to Vygotsky (1980), the More Knowledgeable Other (MKO) could scaffold learner to reach the zone of proximal development (ZPD). When guided, MKO or someone who has higher level of knowledge could lead other learners into achieving higher level of performance. For instance, peers solving a problem together in collaborative learning may offer the opportunities for sharing of ideas and learning experience thus building knowledge and understanding (Roehler & Cantlon, 1997). In addition, learners may benefit from peers' learning when they present their knowledge, produce and receive feedbacks from peers while evaluating and monitoring their own learning consistently. Moreover, peers' feedback and interaction during collaborative learning may also foster student's satisfaction in learning (Richardson & Swan, 2003).

Motivation is an essential element in learning that has direct impact on learners. Motivated learners enjoy and find satisfaction in their learning, thus leading to better performance in return. Nowadays, educators are careful in choosing the instruction methods to cope with learners' learning styles with the hope to engage and motivate learners. Generally, learners feel motivated when they are interested in a task. Subsequently, the learners perceive the task to be important, engage with the task with the belief that they can accomplish, and find satisfaction in doing it (Linnenbrink & Pintrich, 2003).

Basically, there are two classifications of motivation: extrinsic motivation is focusing on rewards while intrinsic motivation is deriving from self-desire inwardly such as interest, excitement, and self-satisfaction (Ryan & Deci, 2000). As a result, there is a need to design and implement learning approach that may enhance learners' engagement and intrinsic motivation. One of the best ways is to adopt collaborative working group in solving a task since the learning environment allows learners to connect with their peers. Furthermore, learning facilitated with appropriate technology tools may increase learners' motivation via interaction between learners and interaction between learners with their learning materials.

26.3 Research Questions

With the literature review on previous research related to collaborative learning with screencast videos, there is a lack of studies in examining the effectiveness of learners-produced videos. As a result, this study aims to investigate constructs related to the mentioned approach in terms of perceived benefits, challenges, motivation, sharing platform, and effective learning tool. This study examines how students' perceptions toward the constructs are related. It also identifies the factors which contribute to the effectiveness of using screencast videos as a learning tool. The research questions for the study are stated below:

1. What are students' perceptions in producing screencast videos from the perspectives of benefits, challenge, motivation, sharing platform, and effectiveness?
2. What are the relationships among students' perceived benefits, challenges, motivation, sharing platform, and effectiveness?
3. What are the factors contributing to students' perceived effectiveness of learner-produced screencast videos?

26.4 Methodology

This study was conducted in a university where 71 undergraduate students were randomly selected from the class of a first-year subject, namely Engineering Mathematics 1. Ethic clearance was approved by the university, and each participant

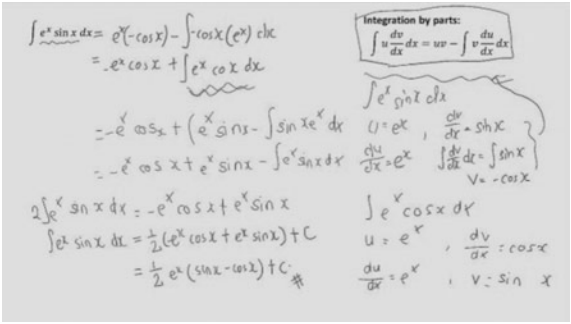

Fig. 26.1 A sample of learner-produced screencast video

gave his/her consent to their participation. The participants developed screencast videos as part of their formative assessments in a semester. Each participant was provided access to computer equipped with WACOM tablet, headphone, and screencast software in the computer laboratory. They worked in a collaborative group of two to three students to produce screencast videos for one of the assessments in Engineering Mathematics 1 (Fig. 26.1). At the end of the semester, an anonymous survey was administered to the participants in this study. The survey intended to understand the learner's perceptions toward learning by learner-produced screencast videos and specify factors which could potentially promote the approach of learner-produced screencast videos as an effective learning tool.

The data were gathered by getting each participant to fill in a survey form. Participants were asked to rate their perceptions toward producing learner-produced screencast videos with a five-point Likert scale (from 'strongly disagree' to 'strongly agree') in the self-assessment survey. The last question in the survey form required the participants to rate their overall satisfaction with the learning approach. The survey was designed based on five constructs to measure participants' perceptions in terms of (a) benefits, (b) challenges, (c) motivation, (d) sharing platform, and (e) effective learning tool.

26.5 Results and Discussions

Tables 26.1, 26.2, 26.3, 26.4, and 26.5 show the descriptive statistics with the corresponding items of the five constructs in the survey. The highest mean score for the item in each construct was emphasized with bold texts. The highest average mean score is 3.89 which obtained from the variable 'benefits' (Table 26.1), while the variable 'challenges' has the lowest overall mean score of 3.40 (Table 26.2). This could possibly due to the items in the variable 'challenges' were written using negative statements.

Table 26.1 summarizes the benefits of learner-produced screencast videos where majority of the participants agreed that the learning approach could foster reflection on their level of understanding ($M = 4.04$; $SD = 0.74$). Moreover, they were able to

Table 26.1 Descriptive statistics for the benefits

Items	Mean (*SD*)
1. I have more opportunities to construct my own understanding	3.94 (0.71)
2. I am more motivated to learn	3.72 (0.70)
3. I could self-reflect on my level of understanding	4.04 (0.74)
4. I am challenged to be responsible in my learning	3.85 (0.74)
5. I could apply creative ideas in working out the solution	3.81 (0.87)
6. I could express my understanding visually and verbally	3.96 (0.80)
The overall average score	3.89 (0.76)

Table 26.2 Descriptive statistics for the challenges

Items	Mean (*SD*)
1. I am not familiar with the screencast software	3.67 (1.07)
2. I spent too much time in video editing and time conversion	3.32 (1.27)
3. I am not used to write with a stylus	**4.03** (1.16)
4. I have to perform multitasking such as explaining while writing	3.26 (1.22)
5. I lack confidence in explaining the concept verbally via video recording	2.55 (1.25)
6. I need to invest more effort and time to produce the videos compare to written assignment	3.56 (1.03)
The overall average score	3.40 (1.17)

Table 26.3 Descriptive statistics for the motivation

Items	Mean (*SD*)
1. I am motivated when my instructor provides essential technical supports	3.83 (0.82)
2. I am motivated when I have a cooperative group working together to produce the videos	3.88 (0.99)
3. I am motivated when my instructor assists the creation of videos	3.68 (0.80)
4. I am motivated when the solutions are corrected by my instructor prior to video recording	3.68 (0.87)
5. I am motivated when I know the completed videos will be viewed by peers	3.31 (0.85)
6. I am motivated to achieve my self-satisfaction on my project contribution	**4.00** (0.79)
The overall average score	3.73 (0.85)

Table 26.4 Descriptive statistics for sharing platform

Items	Mean (*SD*)
1. I have more opportunities to share and learn from each other	**3.90** (0.72)
2. I can develop better understanding through peers' feedbacks	3.82 (0.78)
3. I build self-confidence throughout the learning process	3.79 (0.87)
4. I am actively engaged in the learning process	3.81 (0.72)
The overall average score	3.83 (0.77)

Table 26.5 Descriptive statistics for effectiveness

Items	Mean (*SD*)
1. I expand my critical thinking via the process of constructing screencast videos	3.67 (0.73)
2. The construction of screencast videos increases my conceptual learning	3.69 (0.88)
3. I feel developing greater ownership in my learning as I discover the connections about the concepts	3.75 (0.78)
4. I can remember better about the topics as I explore the concepts more precisely via construction of screencast videos	**4.00** (0.79)
The overall average score	3.78 (0.80)

express their understanding through multiple learning styles (M = 3.96; SD = 0.80) and engage actively in construction of knowledge (M = 3.94; SD = 0.71). Besides, participants also agreed that this learning approach could encourage them to take greater responsibility for their learning (M = 3.85; SD = 0.74).

Table 26.2 shows the summary of challenges in accessing the technology through video production. Participants indicated their ability to cope with explaining the concepts confidently during the production of videos (indicated by the lowest mean of 2.55). However, it was evidenced that most of the challenges participants faced were due to technical proficiency in using technology tools. For instance, the key challenge was 'not used to write with a stylus' (indicated with the highest mean of 4.03). Furthermore, participants revealed that they had little experience in using the screencast software (M = 3.67; SD = 1.07).

Most of the participants expressed high level of motivation as they accomplished the task of video production with self-satisfaction (M = 4.00; SD = 0.79) indicated in Table 26.3. Moreover, participants felt more motivated when working cooperatively in the video production. Most likely, when students shared the task together, it made them feel less anxious, and they could learn from each individual who had different level of knowledge, learning skills, personalities, and background. In contrast, there was slightly lesser motivation when they knew the completed videos would be viewed by peers, with the mean of 3.31.

In general, participants appeared to favor the learner-produced screencast videos approach from the perspective of 'sharing platform' as shown in Table 26.4. Most of the participants rated highly on the item 'opportunities to share and learn from peers' (M = 3.90; SD = 0.72). Besides, they also agreed that they could learn at deeper level with the feedback given by their peers (M = 3.82; SD = 0.78). This was likely contributed by peers giving constructive feedback and sharing their points of view which improve their level of understanding.

Generally, most students perceived learner-produced video as an effective learning tool (Table 26.5). Most of the participants agreed that they could remember more about the content through this learning approach (M = 4.00; SD = 0.79). This could be related to the students' active mental engagement through verbal and visual learning, thus they could retain the knowledge in their mind for an extended period.

In general, participants have positive perceptions toward the learning approach of learner-produced screencast videos. The responses in the survey revealed that they could self-reflect on their level of understanding, achieve self-satisfaction on their contribution, share and learn from peers, and remember better about the topics they solved. Meanwhile, learners also encountered some challenges such as unfamiliar with the technology tools and software as a result of the lack of technology competency.

Finally, the question asking students' overall satisfaction with the learning method received positive response. Most participants rated the approach as 'good' (51%). This followed by the same average score for 'excellent' and 'fair' which is 22%, and only a minority (4%) of the participants felt that the approach needs improvement.

The Cronbach's alpha reliability coefficient value was 0.853 for the variable 'benefits,' 0.678 for the variable 'challenges,' 0.702 for the variable 'motivation,' 0.764 for the variable 'sharing platform,' and 0.766 for the variable 'effectiveness.' Most of the Cronbach's coefficient alpha for the self-developed items showed a reliability coefficient of 0.70 or higher which is considered acceptable reliability, except for the variable 'challenges' which has 0.678. None of the individual variable achieved Cronbach's alpha reliability coefficient of greater than 0.90, which demonstrated the internal consistency of items and variables in the survey.

Pearson's correlation coefficient analyses were calculated to find the correlations between learners' perceptions in terms of benefits, challenges, motivation, sharing platform, and effectiveness (Table 26.6). The correlation analyses indicated a positive correlation between sharing platform and effectiveness with the highest correlation score (0.65). Learners who agreed that learner-produced screencast video approach was a sharing platform also perceived the learning approach as an effective approach. This finding is consistent with the study of Richardson and Swan (2003) that learners' perceptions of social presence were highly associated with their perceived learning.

In addition, most of the variables exhibited significant positive correlations with one another such as correlations between benefits and sharing platform (0.64), benefits and effectiveness (0.61), motivation and effectiveness (0.55), and benefits and motivation (0.51). When learners perceived learner-produced screencast videos as highly beneficial to their learning, they would also feel motivated, and being positive toward sharing and learning with peers. Thus, it is well aligned with the study of Linnenbrink and Pintrich (2003) that positive emotions such as task-related

Table 26.6 Correlation analysis between the variables

Variables	Challenges	Motivation	Sharing platform	Effectiveness
1. Benefits	−0.35	0.51*	0.64*	0.61*
2. Challenges		−0.17	−0.11	−0.20
3. Motivation			0.60*	0.55*
4. Sharing platform				0.65*

*Correlations are significant at the $p < 0.001$

enjoyment and pride relate positively to learners' motivation. As a result, this will potentially enhance learner's achievement since knowledge is more likely to retain longer in learner's memory.

On the other hand, the findings revealed non-statistically significant negative correlation between challenges and other variables. This could probably due to their barriers to technology adoption decreased as the learners gradually adapted to technology with sufficient time given as well as the technical support. Subsequently, learners' perceived satisfaction and effectiveness with learning improved slightly despite the challenges they faced (Sun, Tasi, Finger, Chen, & Yen, 2008).

Multiple regression analyses were performed to further examine the relationships among the five variables in the survey. Specifically, the analyses aim to determine whether learners' perception of effectiveness learning through producing screencast videos could be predicted with the independent variables.

From Table 26.7, the most significant predictor of the effectiveness of learner-produced screencast videos as a learning approach was the variable 'sharing platform' ($F(1, 70) = 52.97$, $p < 0.0001$, $R^2 = 0.43$). It means 43% of the variation in 'effectiveness' was predicted by the variable 'sharing platform.' Additionally, the variables 'benefits' ($F(1, 70) = 41.80$, $p < 0.0001$, $R^2 = 0.37$) and 'motivation' ($F(1, 70) = 31.07$, $p < 0.0001$, $R^2 = 0.31$) were also the key factors which contributed to the effectiveness of screencast videos as a learning tool. In contrast, the variable 'challenges' was not statistically significant or associated with the variable 'effectiveness' of learner-produced screencast videos as a learning approach. In summary, variables like 'benefits,' 'motivation,' and 'sharing platform' play a vital role to promote the effectiveness of the learning approach through learner-produced screencast videos.

With respect to benefits, the study revealed that the learning approach could engage students to evaluate their level of understanding and construct new knowledge by activating prior knowledge. In addition, learning could also be enhanced by expressing the concept through multiple representations such as visual and verbal learning. This may increase the chance of learners to retain the knowledge for a longer period in their memory. If a learning approach is aligned with a learner's preferred learning method, he/she will benefit more from the approach (Butler & Mautz, 1996). Hence, this learning approach which required the learners to generate explanation in both verbal and visual multimedia presentation may enhance the learning of learners who preferred this approach.

Table 26.7 Regression results of predicted relationships among variables

Dependent variable	Independent variables	R^2	p
Effectiveness	Benefits	0.3739	<0.0001
	Challenges	0.0415	0.0862
	Motivation	0.3074	<0.0001
	Sharing platform	0.4308	<0.0001

With respect to motivation, the study revealed that participants were motivated by self-satisfaction with sense of achievement by producing the screencast videos and also working cooperatively in group. These findings were consistent with the study of Pekrun, Goetz, Titz, and Perry (2002) which indicated students' emotion in learning depends heavily on the sense of being able to control and value the learning process. For example, learners in this study enjoyed the learning process because they appreciated the satisfaction and the feeling of control toward the tasks since they could interact and share responsibilities with peers. Suggestions on other ways to motivate students in learning include giving constructive feedback, provide challenging tasks but attainable learning outcomes within effort, and foster learners' belief that they could grasp the content successfully (Linnenbrink & Pintrich 2003).

It was discovered that the effectiveness of the learning approach was mainly due to the factor of 'sharing platform.' Learners seemed to favor the sharing, learning, and also the valuable feedback from peers. Educators should consider the importance of social presence as the impact is not only the influence on learning outcomes but also on student satisfaction toward instructor and course (Richardson & Swan 2003). On the other hand, if the screencast videos production is to be done individually, learners may experience high levels of anxiety due to lack of control over the challenging task and may lead to impaired learning.

The findings from the study also revealed that although implementation of new educational technology approach may stimulate learners' interest, ensuring adequate technology support to students is the key to facilitate effective learning. Besides, educators need to have technology, pedagogy, and content knowledge for effective technology integration in their instruction.

26.6 Conclusions

The findings of this study revealed that effectiveness of the learning approach mainly depends on three critical factors which are benefits, motivation, and sharing platform. The study also implies that social collaboration with peers significantly enhance learners' motivation and engagement toward learning. Suggestions of ways to improve technology-enhanced collaborative learning include group projects which emphasized authentic learning, provide adequate technical support to learners with training, and design activities which stimulate learners' motivation and social interaction. Future research may extent to examine the perceptions and effects of using peer-produced videos as part of learning.

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Part IV
Innovative Practices in Teaching and Learning

Chapter 27
Assessment of Media Literacy Campaign for Grade 4 Pupils at a Public Elementary School in the Philippines

Gerby R. Muya and Ma. Anna Corina P. Kagaoan

Abstract The dynamics and complexity of media environment becomes an important concern among media researchers, as many people are bombarded with complex media messages in their everyday life. In general, this study aims to assess the media literacy campaign for Grade 4 pupils at a public elementary school in Calamba City, Province of Laguna, Philippines. Specifically, it aims to (1) describe the pretest and posttest scores of the respondents in media literacy test; (2) analyze if there is significant change in posttest scores among respondents; and (3) describe satisfaction of pupil respondents to the media literacy campaign. Using the descriptive survey design to assess the effectiveness of media literacy campaign for Grade 4 pupils, this study employed a self-made instrument containing multiple choice type of test measuring knowledge on the types of media and how to use them properly. The instrument was administered before and after the campaign among 126 pupils to determine if there is significant difference in the knowledge scores. The study also assessed how satisfied the respondents were to the campaign. Data were analyzed using frequency counts, percentage, and t test. Comparing between pretest and posttest scores, the study found that there was significant difference in the scores. Results indicate that there was a significant change in the score of the pupils in the knowledge test. This finding was corroborated with the high level of satisfaction to the campaign evidenced in the results of the customer satisfaction measurement. Therefore, the campaign may be a means for the pupils to understand the role media plays and how they can use the media to serve its purpose.

Keywords Media · Literacy · Children · Campaign

G.R. Muya (✉) · Ma.A.C.P. Kagaoan
Lyceum of the Philippines University Laguna, Calamba City, Philippines
e-mail: gerby.muya@lpulaguna.edu.ph

Ma.A.C.P. Kagaoan
e-mail: anna_kagaoan@yahoo.com

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27.1 Introduction

Media, from traditional television to the "new media" (including mobile phones and social media), are ubiquitous and as the global village continues to be wired up electronically, and as individuals move their daily lives online, mass media play a tremendous and increasing role in society, providing information as well as entertainment (Hanson, 2015; Schramm, 1964). Today, many people access information through multifaceted mix of images, text, and sounds. The dynamics and complexity of media environment becomes an important concern among media researchers, as many people are bombarded with complex media messages in their everyday life. How people, particularly the younger generation, make sense of these media messages and how they express themselves using a variety of media tools and technologies thus become a point of study.

Young people today are exposed to media for more than eight hours a day and they live media-saturated lives, typically using media for an average of more than six hours a day (Roberts, Foehr, & Rideout, 2011). Given the prevalence of media, Strasburger, Wilson, and Jordan (2009) claimed that media has the ability to affect the trajectory of the development and even the morality of a nation. Given the potential of media to influence attitudes and behavior of audience, media literacy or knowing how to use the media toward one's advantage is essential.

In a technological society, literacy extends beyond the skills of reading, writing, speaking, and listening to include multiple literacy, such as visual, media, and information literacy. Media literacy is defined *as* the ability to access, analyze, evaluate, and create media in a variety of forms (Aufderheide, 1993). Media literacy is the ability of individuals to access and understand information through different means of media.

According to United Nations Educational, Scientific and Cultural Organization (UNESCO), information and media literacy make it possible for people to interpret, evaluate, and produce information messages. UNESCO's main mission in this area is to acquire and systematically transform and produce fostering information and media literate societies through application of encouragement promoting the development of national information and media literacy policies in an educational aspect (UNESCO, 2011).

The importance of developing media literacy among children who are considered more vulnerable to media influence prompted the researcher to initiate a media literacy campaign, which serves as community project of the College of Arts and Sciences. According to Tyner (2003), if students are to maximize the benefits of media, they should learn how to be creative and critical media users. Thus, this study aims to determine how the said campaign has been effective in meeting its objectives. Results of this study will provide basis for enhancing succeeding campaigns of the same nature under College of Arts and Sciences.

27.1.1 Review of Literature

Media has been a great help to us since the day it was discovered. It is widely used by people nowadays. Media offers the opportunity to improve our way of life; it provides information we can use to perform a course of action or basis to make an important decision. Media also provides the entertainment that oftentimes serves as relief from hustle and bustle of everyday life.

However, many studies have shown that the media do affect adolescents' aggressive and sexual behavior, body satisfaction, and eating disorders, as well as alcohol use and cigarette smoking (Brown, 2006). Thus, helping young people that the media are also in the business of selling products and ideas which may not be beneficial to them and developing critical thinking among them are crucial. Moreover, while media provides opportunity for social engagement, studies on digital divide shows ICT provision undermines equality in education, participation, and culture. Thus, media literacy studies become paramount. Brown (2006) even stressed that media literacy education must involve analysis of the authors and audiences, messages and meanings, and reality and representation.

Among children, media is pervasive. At a young age, students must not just be entertained from what they get from the media; they must also be well-informed of the role and function of media and of how to properly use the media. Eco (1991) emphasizes the importance of teaching how to use the media before using the media for teaching. In other words, the media is not simply a learning tool but also an object of study that students must be able to understand and critique.

Along with the proliferation of media, issues arise on how children make sense of the media messages that are bombarded to them every day and the role of media tools and technologies to them. According to the survey, in just five years, media use has increased from 6.5 to nearly 7.5 h a day in children between the ages of 8 and 18. Even more alarming, children have become master multitaskers, often using two or more media devices at the same time (Roberts et al., 2011). Recent estimates of exposure to media starts early and rises quickly. Roberts and Foehr (2008) further argue that children six years and younger are exposed to daily to media content for almost 2.5 h, implying that this age group uses two or more media platforms at once approximately 25% of their time. Given this media landscape, literature bounds with media literacy studies. There has been similarity on the notion of "media literacy" for at least a quarter of a century, although there is still some confusion and disagreement about how it is to be defined (Buckingham, Burn, & Cranmer, 2005).

For Hobbs (1998), media literacy takes many different forms as evidenced by the issues emerging from debates: protection of children, student media production experiences, popular culture, ideological agenda, media literacy reach, support from media organization, and media literacy as a means to an end. According to Hobbs, response to this debate will shape the future of media literacy movement. Hobbs emphasizes though that media literacy is a tool for educational or social change.

The complexities of media literacy as a concept have spawned new questions and methodological implications. New forms of media literacy have taken shape such as computer literacy or Internet literacy, cyber literacy, network literacy, digital literacy, information literacy, print literacy, audiovisual literacy, critical literacy, visual literacy, oral literacy, cultural literacy, and social literacy (Livingstone, 2004).

As previously mentioned, media literacy has four components: access, analysis, evaluation, and content creation (Aufderheide, 1993). Media literacy entails analysis on how media audiences understand barriers to access analyze engagement with media content and decode and interpret the media, evaluate and select from among the information and services from the media and create content. These components emphasize the skills-based approach to media literacy. Beyond skills-based approach, media literacy studies should also focus on the relationship/interaction between text and reader (Livingstone, 2004). Taking this definition into account, a media literate youth must be able to interpret the complex messages they receive from varied forms of media, can understand how these media messages are constructed, can discover how they create meaning, can also create their own media, and can become active participants in media culture (Montana Office of Public Instruction, 2014).

The prevalence and influence of the media make it a necessary part of twenty-first century education. Billions of people are bombarded daily with information and entertainment through radio, television, print, film, and Internet. By building knowledge and competencies in using media and technology, media literacy education may provide a type of protection to children and young people by helping them make good choices in their media consumption habits, and patterns of usage.

In light of the foregoing discussion, the College of Arts and Sciences through the Communication Theory class on the second semester of academic year 2014–2015 conducted its first media literacy campaign for its adopted school, Makiling Elementary School, a public school located in Makiling, Calamba City, Laguna. The media literacy campaign aims to educate Grade 4 pupils on the forms of media, its importance, and how to use the media. It consisted of four modules: radio, television, print and Internet lessons. The campaign, conducted by second year AB Communication students, involved lectures, interactive discussions and games and multimedia presentations. The campaign period ran during the whole month of September 2014. In this study, the researcher sought to determine the extent of effectiveness of this campaign based on the posttest and the satisfaction survey administered at the end of the campaign.

27.1.2 Objectives

In general, this study aimed to assess the media literacy campaign for Grade 4 pupils at a public elementary school in Calamba City, Province of Laguna, Philippines.

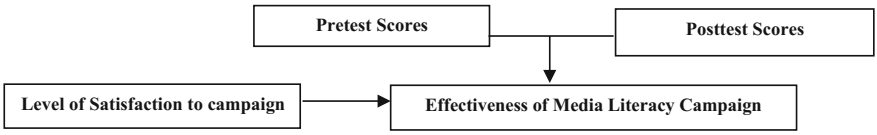

Fig. 27.1 Conceptual framework of the study

Specifically, it aimed to (1) describe the pretest and posttest scores of the respondents in media literacy test; (2) analyze if there is significant change in posttest scores among respondents; and (3) describe satisfaction of pupil respondents to the media literacy campaign.

27.1.3 Conceptual Framework

Figure 27.1 illustrates that effectiveness of the media literacy campaign was measured in terms of the difference in the pretest and posttest scores of the respondents. Moreover, the level of satisfaction to the campaign was also assessed to further support how effective the media literacy campaign was.

27.2 Methodology

This research used the descriptive survey design to assess the effectiveness of media literacy campaign for Grade 4 pupils at Makiling Elementary School, a public elementary school in Calamba City, Province of Laguna, Philippines. A multiple choice type of test (Cronbach's alpha = 0.74) measuring knowledge on the types of media and how to use them properly was administered before and after the campaign among 126 pupils to determine if there is significant difference in the knowledge scores. The study also assessed how satisfied the respondents were to the campaign. Data were analyzed using frequency counts, percentage, and t test.

27.3 Results and Discussion

27.3.1 Profile of Pupils

As shown in Fig. 27.2, there were more male (64 or 51%) than female (62 or 49%) pupils who participated in and completed the campaign, although there is an almost equal number of male and female pupils.

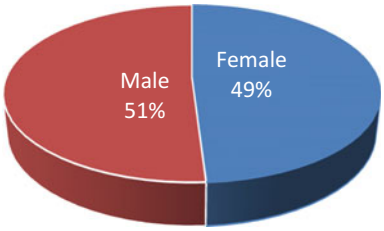

Fig. 27.2 Gender of respondents

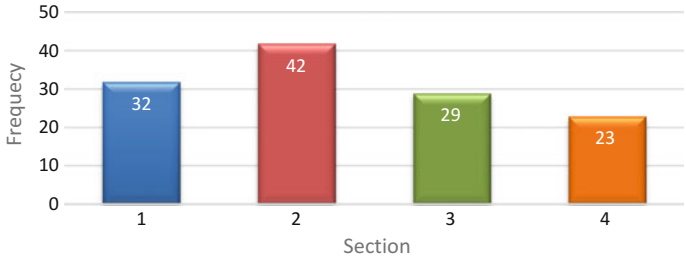

Fig. 27.3 Class size

Four sections of Grade 4 pupils participated in the media literacy campaign. Section 27.2 had the highest number of participants (42 or 33%). Section 27.4 had only 23 participants (18%) at the end of the campaign. When the campaign started, there were 190 students; however, some students started to absent from class. Only 126 students were able to take both pretest and posttest. See Fig. 27.3.

27.3.2 Pretest and Posttest Scores of the Pupils

There were 40 items in the self-made knowledge test administered to the participants. In the pretest, the mean score of the pupils was 29. The highest score the pupils got in the pretest was 38, while the lowest was 11 (Table 27.1).

Likewise, as shown in Table 27.2, only 3% of the students got the highest score. The table further illustrates that scores were highly dispersed. There were only 33 pupils who did fairly well as they received a score of 35, 33, and 32 in the pretest. The results suggest that the pupils got a relatively fair score in media literacy test,

Table 27.1 Mean score of the pupils

	N	Minimum	Maximum	Mean	Std. deviation
Pretest	126	11	38	29.04	5.89
Posttest	126	19	40	32.88	4.76

Table 27.2 Pretest scores

Score	Frequency	Percent
35	12	10
33	11	9
32	10	8
25	9	7
28	9	7
31	9	7
26	8	6
30	8	6
29	6	5
34	6	5
27	4	3
36	4	3
37	4	3
38	4	3
18	3	2
23	3	2
24	3	2
17	2	2
20	2	2
22	2	2
11	1	1
13	1	1
14	1	1
15	1	1
16	1	1
19	1	1
21	1	1
Total	126	100

since most of them were able to answer more than 50% of the questions correctly. This pretest results then served as baseline data on the priority areas in the campaign.

On the other hand, Table 27.3 shows posttest scores of the pupils were higher compared to their pretest. The highest posttest score was 40, while the lowest was 19. The mean score also increased to 32.88, although scores were still dispersed as the standard deviation (4.76) indicates. It can be gleaned though that the standard deviation has slightly decreased in the posttest.

Comparing between pretest and posttest scores, the study found that there was significant difference in the scores (see Table 27.4). Results indicate that there was a significant change in the score of the pupils in the knowledge test. The change in scores may be attributed to the media literacy campaign which served as intervention after the pupils took the pretest.

Table 27.3 Posttest scores

Score	Frequency	Percent
37	15	12
35	13	10
31	11	9
33	10	8
36	10	8
38	10	8
34	8	6
32	7	6
29	6	5
30	6	5
39	6	5
25	5	4
28	4	3
27	3	2
40	3	2
20	2	2
22	2	2
26	2	2
21	1	1
24	1	1
19	1	1
Total	126	100

Table 27.4 Difference between pretest and posttest

	Mean	Std. deviation	t	Sig. (two-tailed)
Pretest–Posttest	−3.84	4.19	−10.28	0.000

Table 27.7 Mean rating of pupil's satisfaction to campaign

Statement	Mean
The time allotted for the event was adequate	4.90
The time and date of the event were convenient	4.53
The venue was spacious and appropriate	4.73
The sound system, lighting, room temperature, and other facilities were adequate	4.90
The teacher showed mastery of the subject and presented the topics clearly	4.84
Level of learning	4.54
The implementers have properly organized and coordinated the program/activity with concerned personnel	4.76
Applicability to life	4.67
Overall, the program was successful	4.74
Composite mean	4.74

Legend 5—Excellent, 4—very good, 3—good, 2—needs improvement, 1—poor

Results of this study support previous studies pointing out that media literacy campaigns are effective in promoting knowledge and understanding among the youth on effects of media on health (Hindin, Contento, & Gussow, 2004; McLean, Paxton, & Wertheim, 2013), political participation (Nijboer & Hammelburg, 2010), critical thinking (Kellner & Share, 2007; Renee Hobbs, 2011), language skills (De Jong & Leseman, 2001, Goodrich et al., 2013; Martens, 2010), among others.

27.3.3 Satisfaction to Media Literacy Campaign

To further assess the campaign, the researcher determined the satisfaction of the pupils to the media literacy campaign through a customer satisfaction measurement being used at Lyceum of the Philippines University Laguna. Table 27.7 reveals a favorable reaction from the Grade 4 pupils to the campaign with an overall mean of 4.74 interpreted as Very Good. Most statements received a rating of more than 4.5 which is Very Good.

The table further shows that students were highly satisfied with the time allotted for the event (4.90) and with the facilities used in the campaign. Although the study did not cover pupils' perception on what contributed best to their satisfaction to the campaign, the campaign facilitators' use of multimedia presentation and equipment may have contributed to the pupils' rating of the campaign. Hartley (2000) mentioned that when people see images at the same time as they hear or read information, understanding and retention go up. A global language, visual language is a means to facilitate more effective communication and learning not only in the field of education, but also in business, science, and technology (Hartley, 2000).

27.4 Conclusion and Recommendation

The media literacy campaign was generally effective based on the increase in the scores between pretest and posttest and on the significant change in posttest scores among Grade 4 pupils. This finding was corroborated with the high level of satisfaction to the campaign evidenced in the results of the customer satisfaction measurement. Therefore, the campaign may be a means for the pupils to understand the role media plays and how they can use the media to serve its purpose.

As technologies are becoming more sophisticated and advanced, campaigns may help educational institutions develop media literacy in varied forms among children and young learners. As media literacy is a highly contested phenomenon, media literacy campaigns of the same nature that may be conducted in the future may focus on a specific area (e.g., media message) and specific medium (e.g., TV commercial) so that outcomes become more observable and measurable. The duration should be considered vis-à-vis the objectives, scope, and strategies of the campaign. Since the campaign lasted for a short period of time, media literacy

cannot be measured effectively. In addition, interviews with participants may provide depth to the results of the study. Overall, the campaign may be sustained and enhanced to promote media literacy not only for the pupils in Makiling but also for students of Lyceum of the Philippines University Laguna and its other adopted schools.

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Chapter 28
Graduate Tracer Study for Industrial Engineering Program from Batch 2013 to 2015

Ryan Jeffrey P. Curbano and Ricky V. Bustamante

Abstract This graduate tracer study aims to survey and trace the graduates from their school of origin to their employment. The researcher used the survey questionnaire developed by the Commission on Higher Education (CHED) to obtain the needed information in the study. The subjects of the study were the Industrial Engineering graduates from batch 2013 to 2015. Findings of the study revealed that majority of the respondents were female, and have monthly income of P15,000 to less than P20,000 in their first job. Majority of the respondents were regular or permanent with their employment status in their jobs and below to a position that is classified as professional/technical or supervisory level of work. The assessment of program and learning were rated moderately agree while the attainment of student outcome was rate above the target of 60%. It was also found out that there was no significant relationship between assessment of learning and program in the employment status and current position. Lastly, the study revealed that Lyceum of the Philippines Laguna provides quality education to the students in the field of Industrial Engineering.

Keywords Tracer study · Industrial engineering · Program · Learning · Student outcome

28.1 Introduction

A tracer study/follow-up study is a graduate or alumni survey that attempts to trace the activities of the graduates or former students of an educational institution. Mercado (2010) explains that tracer studies enable the contextualization of grad-

R.J.P. Curbano (✉) · R.V. Bustamante
Industrial Engineering Department, Lyceum of the Philippines University, Laguna, Calamba, Philippines
e-mail: ryanjeffrey.curbano@lpulaguna.edu.ph

R.V. Bustamante
e-mail: ricky.bustamante@lpulaguna.edu.ph

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uates of a particular university through a system that is dynamic and reliable in order to determine their life path or movement. According to CHED (Commission on Higher Education), graduate tracer study constitutes an important tool for educational planners; as they can provide valuable information for evaluating the productivity of the higher education and training institutions. It is an effort to survey the performance of graduates in the job market upon completion of their chosen field of interest. Graduate tracer studies are increasing and are higher education institution all over the world. A tracer study was perceived as useful to improve the learning process, gauge the market (satisfaction, demand), and building alumni network.

According to Othman, Buntat, Sulaiman, Salleh, and Herawan (2010), Graduates had that much opportunity to develop their employability skills such as communication, leadership, and problem-solving. According to Rivera et al. (2012), the concept of employability requires focusing on four main dimensions: The dimension relating to the skills and competencies that make an individual potentially employable that focused on the motivation to find a job; the one related to social, economic, and cultural determining factors; and the last dimension comprising the diverse effects on work-related, personal, economic, health-related, and unemployment effects. In addition, Ahmad, Zainal, Idris, and Rahmat (2011) find out that competitive graduates in the job market often depend on strong curriculum of the program.

In the Philippines, graduate tracer studies are initiated by the CHED and followed by different colleges and universities. Locally, there are few schools and universities conducting it. But is growing and more are adapting to it in order to improve their effectivity in producing employable graduates.

The study aims to track the graduates of Industrial Engineering in Lyceum of the Philippines Laguna as a way of gauging their capability of securing employment. It is also a means of determining the graduate's satisfaction level during their stay in the university and a means of obtaining basic information on the status of graduates upon graduation.

Lyceum of the Philippines Laguna is calling on all graduates of Industrial Engineering from 2013 to 2015 to participate in the study. It is the institution vision to produce graduates who are well equipped with necessary skills, knowledge, and attitudes. The tracer study wants to know the satisfaction level of the graduates in terms of curriculum, career guidance, quality of lectures, and facilities of the institution. It also seeks to determine the attainment of the student outcomes of the Industrial Engineering graduates. The output of the study will help the university management in planning and determining factors related to the continuous quality improvement of curriculum and services of the institution.

28.1.1 Objectives of Study

The study aimed to trace the Industrial Engineering graduates of Lyceum of the Philippines Laguna from batch 2013 to 2015. Specifically, it sought to answer the following objectives.

1. To describe the demographic profile of the Lyceum of the Philippines Industrial Engineering graduates in terms of gender, monthly income, and length of service.
2. To evaluate Industrial Engineering program in terms assessment of program and assessment of learning.
3. To assess the extent of attainment of student outcomes based on target.
4. To determine the current status of employment and position of the graduates.
5. To find out if there is significant relationship between the assessment of the program and status of employment and the current position.
6. To find out if there is significant relationship between the assessment of learning and status of employment and current position.

28.1.2 Scope and Limitation of the Study

The study is limited to the preparation and evaluation of graduates that seek to improve the quality education at Lyceum of the Philippines Laguna and to be able to identify graduates employment status. This study only includes graduates of Industrial Engineering of Lyceum of the Philippines Laguna from batches 2013 to 2015. This was conducted via online survey that ran from January 2016 to August 2016. The respondents who answered on the given period are the ones that will only be considered and used in the study. The conduct of the study was online through the use of Google Docs, a Google application.

28.1.3 Conceptual Framework

The framework is an intermediate theory that attempts to connect to all aspects of inquiry. It shows how the program and learning acquired from the institution affect the employment status and position of the students after graduation. It also shows how the attainment of student outcomes affects the employment status and position of graduates (Fig. 28.1).

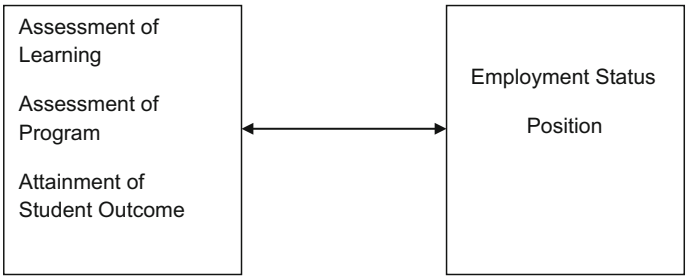

Fig. 28.1 Conceptual framework

28.2 Methodology

28.2.1 Research Design

The researcher used descriptive research in the study because it involved collections of quantitative information such as profile of respondents, assessment of learning and program, and attainment of student outcomes.

28.2.2 Respondents of the Study

The researchers selected all the graduates of Industrial Engineering of LPU-L from batch 2013 to 2015. There were total of 82 graduates from batch 2013 to 2015. The researcher only used the survey answers that ran from the survey period provided by the researchers. This was due to unexpected slow retrieval of survey answer from the period January 2016–August 2016. Retrieval rate was 53.65% or 44 out of 82 respondents.

28.2.3 Research Instruments

The researcher used a questionnaire as instrument of the study. The questionnaire was adapted in the CHED instrument, and it was modified to include the attainment of student outcomes based on the CHED Memorandum Order 15 series of 2008. The questionnaire is currently being used for graduate tracer study of the institution under Research and Statistics Center. It is an online survey questionnaire through Google Docs, a Google application. The questionnaires were divided into three parts. The first part was about profile of respondents. The second part was about

assessment of learning and program and the last part was about assessment of attainment of student outcomes. Each item of questionnaire will have options 5—strongly agree, 4—moderately agree, 3—agree, 2—disagree, and 1—strongly disagree.

28.2.4 Statistical Treatment

The statistical treatments to be used in the interpretation of the data and testing the null hypothesis of the study will include the percentage formula, weighted mean, and Pearson correlation coefficient. The percentage formula was used to describe and present the profile of respondents and attainment of student outcome. The weighted mean was used to determine to what extent the graduates of Industrial Engineering students evaluate the program and learning. The Pearson correlation coefficient was used to find out the relationship of assessment of program and learning in the employment status and position.

28.3 Results and Discussion

This chapter contains all the results of the survey that was given to all of the respondents of the research.

Table 28.1 shows the distribution of respondents in terms of gender. There 24 out of 44 or 54.55% were female, and 20 out of 44 or 45.45% were male. This showed that majority respondents who answer the questionnaire were female.

Table 28.2 shows the distribution of the respondents in terms of length of service. Most of the graduates (31.82%) have stayed in their jobs for 2 years to less than three years. This is followed by one year to less than two years with (22.72%), then by seven to eleven months with (18.18%), one to six months with (15.90%), less than a month with (4.55%) and (6.81%) with no service because they own family business.

Table 28.3 shows the distribution of the respondents in terms of income. Majority of the graduates (54.55%) have earned an initial gross monthly income of P15,000 to less than P20,000 in their first job. The minority (25%) on the other hand have monthly income of P10,000 to less than P15,000. 6.82% have monthly income of P5,000–P10,000 and P20,000 to less than P25,000. 4.54% have monthly

Table 28.1 Distribution of respondents in terms gender

Gender	Frequency	Percent
Male	20	45.45
Female	24	54.55
Total	44	100.00

Table 28.2 Distribution of the respondents in terms of length of service

Length service	Frequency	Percent
No service	3	6.81
Less than a month	2	4.55
1–6 months	7	15.90
7–11 months	8	18.18
1 year to less 2 years	10	22.72
2 years to less 3 years	14	31.82
Total	44	100

Table 28.3 Distribution of the respondents in terms of income

Income	Frequency	Percent
P5000 less than P10,000	3	6.82
P10,000 to less than P15,000	11	25
P15,000 to less than P20,000	24	54.55
P20,000 to less than P25,000	3	6.82
P30, 000 to less than P40,000	2	4.54
P40,000 to less than P50,000	1	2.27
Total	44	100

income of P30,000 to less than P40,000 and (2.27%) have monthly income of P40,000 to less than P50,000.

Table 28.4 shows that the assessment of Industrial Engineering program obtained a composite mean of 3.93 with verbal interpretation of "Moderately Agree." It was noted that "On-the-job training/internship is enough to equip the students with hands-on training experienced related to the job" with mean of 4.13 verbally interpreted as "Moderately Agree" and "The program components are relevant to the job" with a mean of 4.13 verbally interpreted as "Moderately Agree." It shows that internship program of the institution helps the students to be prepared for their actual job. On the other hand, "The program length is sufficient to produce graduates with the required entry-level knowledge and/or skill in the field/workplace" had lowest mean of 3.38 verbally interpreted as "Agree." This means that the knowledge and skills of the programs should be checked and aligned with the needs of the industry.

Table 28.5 shows that the assessment of learning of Industrial Engineering program obtained a composite mean of 3.91 verbally interpreted as "Moderately Agree." All of the measures in the assessment of learning obtained a verbal interpretation of "Moderately Agree." This shows that Industrial Engineering students developed an attitude as team player, better in time management skills, become more enthusiastic in further learning and open to ideas of others, become more responsible and independent in their work, and become analytical and problem solver (Table 28.6).

The table shows the results of the survey to the graduates of BSIE. Based on the result of the survey, all students' outcomes were rated above satisfactory level of attainment of 60%. Students outcomes (2) "ability to design and conduct

Table 28.4 Assessment of the program

Assessment of program	Weighted mean	Verbal interpretation	Rank
1. The course content is very comprehensive and relevant to the job	4.08	Moderately agree	3
2. The program components are relevant to the job	4.13	Moderately agree	1.5
3. The objectives of the program had been achieved	4.09	Moderately agree	2
4. The objectives of the program are similar to the objectives of the workplace	4.04	Moderately agree	4.5
5. The program length is sufficient to produce graduates with the required entry-level knowledge and/or skill in the field/workplace	3.38	Agree	11
6. The program description captures the types of duties a graduate can expect to perform in the work environment	3.91	Moderately agree	7
7. The courses are relevant to the intended career	3.91	Moderately agree	7
8. Quality of instruction is sufficient and provided what is required in the workplace	3.74	Moderately agree	10
9. Quantity of instruction is sufficient for the requirement of the workplace	3.78	Moderately agree	9
10. Quality of guidance services is sufficient for the requirement of the workplace	3.91	Moderately agree	7
11. Interpersonal relationships had been developed in school	4.04	Moderately agree	4.5
12. On-the-job training/internship is enough to equip the students with hands-on experiences related to the job	4.13	Moderately agree	1.5
Composite mean	3.93	Moderately agree	

experiments as well as analyze and interpret data" with mean percentage of 89.09%, (3) "ability to work effectively in multidisciplinary and multicultural teams" with 86.67%, (7) "Recognition of professional and ethical responsibility" with 86.67%, (11) "ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of work standards, statistical process control systems, production planning and materials control systems, manufacturing and service facilities, operations research models for production and operations, information systems" with 86.67%, and (12) "knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environment" with 86.67% had the highest mean percentage. It also manifests in the students verbatim comments that professors and their teaching strategies are the strongest points of college.

Table 28.7 shows the distribution of the respondents in terms of employment status. Majority of the graduates are regular or permanent (70.45%) with their employment status in their jobs, while minority (15.91%) is probationary, (6.82%) are temporary or contractual, and (6.82%) are own business.

Table 28.5 Assessment of learning

Assessment of learning	Weighted mean	Verbal interpretation	Rank
1. Developed knowledge and skills applicable to a career	3.65	Moderately agree	16
2. Developed my ability to work as a team	4.13	Moderately agree	2
3. Motivated me to do my best work	4.17	Moderately agree	1
4. Provided me with a broad overview of my course/major	3.7	Moderately agree	14.5
5. Developed my time management skills	3.83	Moderately agree	11
6. Developed my initiative	4.04	Moderately agree	3.5
7. Sharpened my analytical skills	3.78	Moderately agree	12
8. Developed my creativity	4.04	Moderately agree	3.5
9. Developed my confidence to investigate new ideas	4.00	Moderately agree	4
10. Developed my problem-solving skills	4.00	Moderately agree	4
11. Stimulated my enthusiasm for further learning	4.00	Moderately agree	4
12. Improved my skills in written communication	3.87	Moderately agree	10
13. Helped developed my ability to plan my own work	3.96	Moderately agree	8
14. Helped me make informed judgment	3.91	Moderately agree	9
15. Developed my computer skills	3.70	Moderately agree	14.5
16. Developed my oral communication skills	3.74	Moderately agree	13
Composite mean	3.91	Moderately agree	

Table 28.8 shows the distribution of respondents in terms of position. Majority of the graduates (68.18%) belong to a position that was classified as professional or technical/supervisory level of work, while minority (13.63%) were classified as managerial, (11.36%) no response, (4.55%) were classified as rank and file (Table 28.9).

The assessment of the program and status of employment obtained a Pearson correlation of −0.265 with probability value of 0.221 verbally interpreted as not significant. While the assessment of the program and current position obtained a Pearson correlation of −0.369 with probability value of 0.084 verbally interpreted as not significant. Aquino et al. (2013) find out that assessment of program has inverse relationship in status of employment and current position. This means that the status of employment and current position does not depend on the program assessment (Table 28.10).

The assessment of learning and the status of employment obtained Pearson correlation coefficient of 0.107 and probability of 0.627 verbally interpreted "not significant"; however, there was direct relationship between assessment of learning

Table 28.6 Extent of attainment of student outcomes

Extent of achieving student outcomes	Percentage of attainment (%)	Target mean rating (%)
1. Your education manifests ability to apply knowledge of mathematics, physical and information sciences, and engineering sciences to the practice of Industrial Engineering	86.06	60
2. Your education promotes the ability to design and conduct experiments as well as to analyze and interpret data	89.09	60
3. Your education develops the ability to design, build, improve, and install systems or processes which are efficient, effective, as well as robust to meet desired needs within identified constraints	84.84	60
3. Your education develops the ability to work effectively in multidisciplinary and multicultural teams	86.67	60
4. Your education promotes the ability to identify, formulate, and solve engineering problems	84.85	60
5. Your education teaches the ability to effectively communicate orally and in writing using the English language	83.63	60
7. Your education provides recognition of professional and ethical responsibility	86.67	60
8. Your education provides understanding of the effects of engineering solutions in a comprehensive context	84.24	60
9. Your education paves the way the ability to engage in life-long learning and an understanding of the need to keep current of the developments in the specific field of specialization	84.85	60
10. Your education makes extensive use of the techniques, skills, and engineering tools necessary for engineering and business practice	85.45	60
11 Your education develops ability to perform services in the form of analysis, design, preparation of plans, specifications, estimates, and implementation of work standards, statistical process control systems, production planning and materials control systems, manufacturing and service facilities, operations research models for production and operations, information systems	86.67	60
12. Your education provides extensive knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environment	86.67	60

Source Policies and Guidelines for BS Industrial Engineering CMO 15 series of 2008

and status of employment. While assessment of learning and current position obtained −0.108 and probability of 0.624 verbally interpreted as "not significant." This means that there is no significant relationship between assessment of learning

Table 28.7 Distribution of respondents in terms employment status

Employment status	Frequency	Percent
Regular/permanent	31	70.45
Temporary/contractual	3	6.82
Probationary	7	15.91
Own business	3	6.82
Total	44	100

Table 28.8 Distribution of respondents in terms of position

Position	Frequency	Percent
Rank and file	2	4.55
Professional/technical	30	68.18
Managerial	6	13.63
Self-employed	1	2.27
No response	5	11.36
Total	44	100

Table 28.9 Relationship of assessment of program and status of employment and current position

	Correlation coefficient, r	Probability	Verbal interpretation
Status of employment	−0.265	0.221	Not significant
Current position	−0.369	0.084	Not significant

Legend P value $\geq$ 0.05—Not significant, *P* value < 0.05—Significant

Table 28.10 Relationship of assessment of learning and status of employment and current position

	Correlation coefficient, r	Probability	Verbal interpretation
Status of employment	0.107	0.627	Not significant
Current position	−0.108	0.624	Not significant

Legend P value $\geq$ 0.05—Not significant, *P* value < 0.05—Significant

and status of employment and current position. Aquino et al. (2013) revealed that there are companies provide intensive training to relate to the need of the industry.

28.4 Conclusion

Majority of the respondents were female. Most of the graduates stay in their first job that ranges from 2 years or less than 3 years. The initial monthly income of the Industrial Engineering graduate ranges from P15,000 to less than P20,000 and majority of the IE graduates are regular or permanent with their employment status and are working in a professional/technical or supervisory level of work. The graduates evaluate the Industrial Engineering program as “Moderately Agree” with

composite mean of 3.93. Similarly, in the assessment of learning for Industrial Engineering course it obtained a composite mean of 3.91, verbally interpreted as "Moderately Agree." The assessment of the respondents in terms of attainment student outcomes obtained overall percentage 85.31% against the target of 60%. The evaluation tells that LPU-L has provided quality education to the graduates. It was found out that there is no significant relationship between the assessment of program and employment status and current position and similarly in the assessment of learning and employment status and current position. This also proves in the study that the status of employment within one's job does not depend so much on lack of education.

28.5 Recommendation

The researcher would like to recommend that the course syllabus should be given importance by the institution since review of curriculum done yearly by each department through Industry Board of Advisers meeting. Quality of instruction should emphasized well, the outcome-based instruction are encourage practicing more inside the classroom. On-the-job training should have a training plan prior deployment on the job to ensure the knowledge learned inside the classroom is applied in the actual work. More updated industry software tools should be integrated in the lecture.

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Chapter 29
The Effectiveness of MOOC Among Learners Based on Kirkpatrick's Model

Wei Wei Goh, Seng Yue Wong and Enna Ayub

Abstract Massive open online course (MOOCs) are transforming the era of distance learning education in a groundbreaking way that it has attracted a huge amount of attention from the media, education institutions, and education professionals. The purpose of this study is to measure the effectiveness of courses delivered using MOOCs in Taylor's University. The Kirkpatrick's four levels of evaluation learning model were adapted to measure the effectiveness of MOOCs. A descriptive survey of 250 learners was conducted. The study indicated that comprehensive study materials in MOOCs are useful for the learners as future reference. MOOCs are effective in the sense that it helps learners to understand a certain topic and apply it in real life. The program has met the learners' expectations, and they will strongly recommend the course to other people. Nevertheless, learners think that the study materials are sufficient for beginners, but advanced course is needed to meet their future job expectation. This study focuses on MOOCs in OpenLearning platform only. In the future, research can be expanded to focus on different MOOC platforms besides OpenLearning. Lastly, with the result obtained in this research, it will be able to contribute to the community of MOOC and institutions that plan to introduce MOOCs.

Keywords Kirkpatrick evaluation model · MOOCs · Effectiveness

W.W. Goh (✉) · S.Y. Wong · E. Ayub
Taylor's University, Subang Jaya, Malaysia
e-mail: WeiWei.Goh@taylors.edu.my

S.Y. Wong
e-mail: SengYue.Wong@taylors.edu.my

E. Ayub
e-mail: Enna.Ayub@taylors.edu.my

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29.1 Introduction

Today's online learning has offered rich educational resources in multiple media, including social media and the capability to support synchronous and asynchronous communication between instructors and learners as well as different types of learners, with the advent of Internet and World Wide Web (WWW). Hence, the potential for approaching to learners from the worldwide has been risen progressively, and the adoption of online learning or electronic learning (e-learning) from the higher education institution (HEI) and corporate training institution also increased rapidly. Globalized online learning is the ninth shift of Malaysian Education Blueprint, which has highlighted by Ministry of Education, Malaysia, for the transformation of Malaysian higher education system (Ministry of Education, 2015). Massive open online course (MOOC) is one of the main strategies that were initiated by Malaysian Government, with the Malaysian Education Blueprint for higher education, National Economic Model, and Economic Transformation Program (Mansor, Latifah, & Tengku Amina, 2015; Nor Fadzleen, Rose, & Naoki, 2015). MOOC has emerged as a significant environment for online learning, yet little is known about how user actually learns in a MOOC (Malligan, Littlejohn, & Hood, 2016).

MOOC is an online course which consists of recorded online video lectures on any given topic by one or more university professors and educators that is then easily accessed online by anyone around the world (Goh, Kaur, & Chion, 2015). Cloud system is hosted all learning materials, and the learning contents are delivered online so that it can be accessible from anywhere on the Web. The first Malaysian MOOC is launched by a private higher education, named Taylor's University, which offered entrepreneurship by the Dean of School of Engineering via OpenLearning platform (Mansor et al., 2015; Nor Fadzleen et al., 2015; Muhstak, 2014). The pilot MOOC has initially created with the goal to promote higher education institution's presence online learning and designed to attract students to further their studies.

Moreover, Malaysia also became the first country in the world to implement MOOC initiative for public universities (Nor Fadzleen et al., 2015; Ratnaria, Azizudin, Bakri, Muhammad, & Khaliza, 2015). The objective of this initiative is to boost the ranking of Malaysian higher education on global scale, by providing globalized, opened online learning experience without the limitation of time and accessibility (Nor Fadzleen et al., 2015). In Malaysia, the MOOC movement is still new and most of the HEI has just begun to catch on its wave and making MOOC to fit into their e-learning or blended learning system and platforms. The adoption of MOOC is also a strategy to bolster the international visibility and the university's reputation (Ayub & Lim, 2016). With the emergence and implementation of MOOC in HEI, there are same issues regarding the concept of MOOC, questioning about pedagogical elements in MOOC (Gene, Nunez, & Blanco, 2014), assessment system and interaction between instructors and learners, and low completion rate (Chen & Chen, 2015; Gene et al., 2014).

Thus, the purpose of this study is to measure the effectiveness of courses delivered using MOOCs in Taylor's University. The Kirkpatrick's four levels of evaluation model have been adopted to evaluate the effectiveness of the MOOCs. The results presented in the following section relate to the identified research questions. The research questions are as follows: (1) How effective are the courses delivered using MOOCs and (2) what are the issues faced when using MOOCs? Although MOOC is the peak of the hype cycle of the education system in year 2013, it will be gone down, at the midst of the "trough of disillusionment." Hence, this study has yet to represent MOOCs' effectiveness in all higher education system; however, this survey study has explored on how effective the MOOCs that conducted in a selected higher education institution. The researchers hope the findings from this study will be able to contribute to the community of MOOC and other HEI that plan to implement MOOCs.

29.2 Literature Review

As a disruptive innovation, massive open online course (MOOC) has brought to revolution in education and made potential changes in the existing higher education landscape. Availability, affordability, and opportunity are three features of MOOC, which provides high quality of learning contents to the worldwide students. MOOC is used to promote lifelong learning which is crucial to increase students' knowledge, deepened thinking skills, improve attitudes, and achieve learning goals in future life. Thus, MOOC provides free and open education to students from the world and is currently leading to new learning scenarios (Munoz-Merino, Ruiperez-Valiente, Alario-Hoyos, Perez-Sanagustin, & Kloos, 2015).

MOOC has shown a convergence of interests in social, economic, and technology developments in education in a global context. Five changes have been explored in higher education landscape (Yuan & Powell, 2013): (1) the expanded momentum of globalized learning; (2) the increased demand for accessibility to higher education; (3) the changing of learners' demographics, experiences, and the growing numbers of lifelong learners; (4) the increased accessibility of social media and promote personalized learning (Grosseck, Holotescu, Bran, & Ivanova, 2015; Yuan & Powell, 2013); and (5) the changing model for higher education cost and affordability. Moreover, MOOCs also provide HEI with a platform to think creatively and innovatively and to explore new pedagogical practices, business models, and flexible learning paths in their provision. Hence, openness, a vital feature in driving educational innovation and transforming higher education system in the world (Yuan & Powell, 2013).

The great deal of MOOC is they will provide free access and cutting-edge courses which can drive down the cost of university-level education and potentially disrupt the existing models in higher education. Many platforms are used to provide MOOCs in HEI, such as edX, Coursera, FutureLearn, and Audacity (Yuan & Powell, 2013). Some studies of the MOOC believe that MOOC can benefit the HEI,

lecturers, and students. For instance, MOOCs represent the ultimate democratization of education, by offering the easy accessibility to all. In most cases, participants subscribe MOOCs for free of charge and in some cases for a small or minimal fee to obtain a completion certificate (Hew & Cheung, 2014).

Nevertheless, the effectiveness issues of MOOC need to be explored to ensure MOOC really can be implemented in Malaysia in future. Strategic discussion concerning the disruptive potential of MOOC in higher education institutions needs to be conducted. Thus, higher education institutions need to make decisions about how to serve their specific mission and how to react to the different needs of students in a rapidly changing educational market.

29.3 Methodology of the Study

Each of the four levels of the Kirkpatrick model was applied in this survey. This paper will objectively discuss the effectiveness of Taylor's MOOCs based on the Kirkpatrick's model adopting quantitative and qualitative approach. This model helps to objectively analyze the effectiveness and impact of training, and this method was also used to analyze the MOOCs as it is important for the course creators and instructors to get feedback on how the MOOCs have impacted the learners and how they may improve the courses in the future.

The measures in Kirkpatrick's model are recommended to preliminarily evaluate Taylor's pilot MOOCs to get an all-encompassing evaluation of learning using MOOC as pedagogy. The following are the measures adopted into the survey given to the students after they have completed their MOOCs:

- **Level 1**: Learner's reaction—what they thought and felt about the MOOCs and whether the learning experience met their expectations (the Learning Environment)
- **Level 2**: Learner's learning—what they thought and felt about the learning environment that is OpenLearning in MOOCs and whether they thought the MOOCs met their expectation and increased their ease of obtaining knowledge or capability (Overall)
- **Level 3**: Learner's behavior—in what they think the MOOC is relevant and helpful for their future success also the extent of behavior and capability improvement and the application is also looked for (Relevance)
- **Level 4**: Effectiveness results—the effects of MOOC on student's learning and their confidence on applying what they have learned as a result from taking up the MOOC and the engagement from facilitators and their peers were also observed qualitatively (Energy for Change)

This study is a descriptive study. This study is used to collect different types of information and description from different perspectives to determine the effectiveness of MOOC in Taylor's University via a survey research method. Data were

collected via a questionnaire when the participants had completed their MOOCs. Taylor's University is estimated having 4000 students in population. As mentioned above, there are 250 students be the respondents for this study. Thus, the sample proportion of the population with the population size = 4000 are equal to 0.0625. Since the sample proportion value is more than 0.05 (5%), therefore, the number of subjects is sufficient for the study (Chua, 2012).

29.4 Findings and Discussion

The findings of the survey will be presented and discussed based on two research questions as mentioned in the introduction, the effectiveness of MOOCs and the issues of using MOOCs from the learners' perceptions.

29.4.1 The Effectiveness of MOOCs

(a) **Helpful study materials and suitable program**

One of the major findings for the effectiveness of MOOCs is that the learners find the program is suitable to a wide range of learners. The curriculum in MOOCs featured a publicly shared curriculum with open-ended learning outcomes. According to the learners, the content-based MOOCs are anchored in content. It is free access to all learning materials such as lecture, small videos clips, text-based readings, slides, practical exercises, audio files, URL to other resources, online articles, discussion forums, case study, self-reflection, and peer feedback.

The learners expressed that all the contents in MOOCs appeared in a structured form with video and appropriate assessment timeline. It makes study more accessible, affordable, and attainable. The lecture slides and learning materials are helpful. The use of short videos is interconnected with formative quizzes that are based on lecture slides. The exercise instructions are clear and easy to understand. It helps the learners in their quizzes and assessment.

The finding shows that the learners like the downloaded lecture slides. The learners do not have to spend time on compiling study materials. All the finished works are saved automatically. The learners attempt to model a real-life project after completed the MOOC. Hence, effective materials can encourage and sustain engagement and thereby assisting learning. Curriculum activities, course activities, assignments, and assessment need to be considered in order to design an effective MOOCs. Assessments are encouraged to be built around a mapping between intended learning outcomes and objectives of the topic (Terras & Ramsay, 2015).

(b) **MOOC is useful for future reference**

The learners think that MOOCs can greatly improve their knowledge for their future working environment. According to the learners, learning using MOOCs has given them the opportunities to improve and update their portfolio. The certification of the course is valuable to be added into the learner's CV. One of the learners expressed that videos and activities in MOOCs related to field trip and analysis have created the inspiration and ideas for them especially in their studio design.

When the learners read the articles posted in MOOCs, the learning materials have created their curiosity and they start to research further for more knowledge. They have a clearer idea on what they are learning and how it works. The learners admit that the knowledge that they have learned in MOOCs is benefit to them in the future as they have a better understanding on the topics. This provides them the opportunity for better income and continues learning throughout life.

Gomez-Zermeno and Garza (2016) also agreed that MOOC is an alternative educational method for professionals who look for complimentary training and education. MOOC is suitable for people with professional education and experience to expand their knowledge (Ari, 2013). Furthermore, the learners highlighted that they started to apply what they have learned in MOOCs to their real life. They agree that the course allows the acquisition of new knowledge and skills in their field. It has widened their knowledge after completed the course. They mentioned the relevance of MOOCs to the subject area they are studying. The learners are able to model a real-life project after the tutorial in MOOCs. They started to apply what they have learned in MOOCs to their real life. Table 29.1 has presented the learners' thoughts about the MOOCs for future reference.

Table 29.1 Learners' think that MOOCs are useful for future reference

"Yes, the relevance of content is beneficial for future reference"
"This subject has thought me many aspects of architecture that is relevant to my studio such as poetics, material, and vernacular components"
"The program material will be helpful for my success in the future"
"I will be using it as part of my civil career"
"I am not quite sure how to apply this knowledge in real-life experience, but I believe that the information will come in handy and will surely benefit me in the future, as I now have a stronger understanding of Malaysian architecture"
"Yes. There are also good videos in which students may refer to back in the future"
"The information gave us more exposure on Malaysian architecture that I think will help us in designing in the future"
"I have successfully model a real-life project after Revit 101 tutorial"

(c) **Help learners to understand a certain topic better**

We can see from the result that the majority of the learners engaged in the collaborative group discussion. Learners think that MOOCs are good platform to voice out and share opinions. All the learners have the chance to answer the questions and share opinions because there might not be enough time for everyone to answer the questions in class. With the flexible and adaptable means of delivering content, learners are able to learn and share knowledge with their peers through discussion forum. In MOOCs, each topic is related to an issue and the learners are required to express their opinions and complete the activities after reading each topic. The step-by-step course helps the learners to grasp the topics. This way helps them to understand the topics better.

(d) **Strongly recommend the course to other people**

By analyzing the data, we can see that learners are quite satisfied with the courses provided using MOOCs. They generally feel that MOOCs can raise their interest in learning and learning efficiency. This is mainly because students in information age have a great sense of curiosity and the ability to adapt to the MOOC environment (Ji, 2016). From the survey, the learners share their opinion that they will strongly recommend the course to people that they know because it is interesting and well-organized. They agreed that MOOCs have enhanced their knowledge. Table 29.2 also presented the recommendations from the learners' perceptions.

(e) **The program has met the learner's expectation**

The program has met the learner's expectation. They think that it is fun besides gaining extra knowledge and experiences. The program is well-organized with precise and clear instructions. Furthermore, it is simple, comprehensive, and free. The learners like the way where all the information can be shared among the learners. The learners can do some research before responding to the questions. There is a two-way communication in MOOCs. They can discuss and share their opinions with their peers in the discussion forum. MOOCs have provided comprehensive insights to the learners on certain topics. MOOC teaching platform gained certain effects and inspired students' interest in learning and improved their learning efficiency. The findings from (Garza, Sancho-Vinuesa, & Gomez Zermeno, 2015) also mentioned that 43.3% of the participants have met their expectation where MOOC helped them to acquire enriched learning. 23.6% of the participants have experienced higher learning proficiency compared to a classroom environment.

(f) **Information is sufficient for learners to apply in the future as a basic course, but more detailed information is needed for advanced course**

According to the learners, the learning materials are sufficient for beginners in order for them to utilize in the future. It is useful for those learners who have less experience in the topic. The learners have received various resources from the module. It works as a starting point for them to further reading and learning about it.

Table 29.2 Recommendations from the learners' perceptions

"I would strongly recommend to the people. I know because it is not only an interesting side, but it is also very well-organized"
"Overall, it was a fun and enjoyable course that I would recommend to others"
"I have already recommended it to a friend who thinks he might take this course in the future"
"Totally loved this course and have persuaded three other colleagues to join too. They should be finishing soon too!"
"I gain much more than I'd expected from this program. I'm already starting to recommend my friends to take this program"
"I will definitely promote this course"

Table 29.3 Learners' perceptions regard to the sufficiency of information in MOOCs

"Yes, it gives good basic knowledge and motivates to learn more"
"Yes it is sufficient as most of us as a student in Malaysia are not exposed to Malaysian architecture. Throughout the course, there are sufficient info about Malaysian architecture and how and what to consider in designing for the future with the climate condition and the culture within Malaysia"
"I think all the information provided is a baseline and starter kits for us to look for Malaysian architectural identity. It still needs a lot of further research to make it applicable in the future"
"Yes. There were various resources I got from this module. The informative text and reader are very helpful in developing my understanding toward architecture, and also, I have learnt how to read a building in terms of function, structure, and aesthetic. Thus, these are very sufficient for me in architecture practice now and future"
"Yes, the information provided and delivered in this module is more than sufficient for me to apply it in my upcoming semesters and in my everyday life"
"Yes, I am sure that everything I learned from this course will help me in my future"

Nevertheless, the information may not be sufficient for those seeking for an advanced course. More details are needed for those who would like to learn more. Practices and activities are still required to make the learners more familiar with the topics. Current MOOCs help to spark the interest of those who are curious about the topics. They can learn some topics which they cannot learn in the classrooms. The learning process helps the learners to know when and where they can apply the knowledge. It also provides revision for some basic topics. Table 29.3 has shown the learners' perceptions regarding the sufficiency of information in MOOCs.

29.4.2 The Issues of Using MOOCs

Some issues are identified from the survey, which are including lack of knowledge in using MOOCs for novice learners and lack of support and guidance from the facilitators. Most of the learners are fresh and new to MOOCs. It takes some time for them to know how to start using MOOCs because some of the learners have

limited IT knowledge. Some of them do not know how to begin to use MOOCs as a learning tool. They have difficulties with the structures of the course and lack of tutorial to guide them.

They would like to have some technical support and time management to plan for their course activities and assessment. Digital literacy skill of MOOCs is one of the factors to engage learners successfully. It is crucial to have an insight into how learners interact with technology in MOOCs in order to provide necessary training and guidance to the learners. Support for diverse MOOC users is essential for this new learning paradigm to enable learners to adapt to this new learning method. Workshop can be conducted to educate the learners on how to use MOOC. Help and support are important for the learners especially those who use it for the first time. Good support from various teams will help the learners to use the MOOCs easily. This includes welcome tutorial to guide the novice learners on the function and structure of MOOC.

Besides having the necessary knowledge and skills on how to use MOOCs, the learners would like to have a better understanding on the requirement from their facilitators. Some of them do not sure whether the answer that they have provided has fulfilled the requirement of the assessment criteria. They were afraid that the answer that they provided is wrong. (Terras & Ramsay, 2015) Hence, individualized feedback is one of the most important ways of keeping students engaged in their studies.

Furthermore, most of the learners are working adults. Level of involvement in MOOC may vary. There is a time constraint for them to do the activities in MOOCs. The workload in their career is high. They have less time to do the assessment and submit on time. Hence, it is important for the learners to define their own learning paths and not navigate the content and assessment tasks in a linear manner (Rolfe, 2015).

29.5 Conclusion

In conclusion, the learners have perceived that MOOC is an effective course with helpful study materials. It is useful for their future reference and allows them to apply what they have learned in real-life experience. The program has met the learners' expectation, and they will strongly recommend the course to other people. The findings have shown that participating learners' perceived level of MOOC satisfaction was generally at a high level. MOOCs make the teaching more effective by reforming the traditional learning methods. Nevertheless, the learning materials are sufficient for learners to apply in the future as a basic course, but more detailed learning materials are needed for advanced course. Issues such as the structure of MOOCs, support, guidance, and motivation are crucial for successful learning. The lack of skills, motivation, and support is the contributory factor for lack of engagement in MOOC (Garza et al., 2015). Terras and Ramsay (2015) also agreed that digital literacy skills, individual motivation, and self-regulation are the key

learner attributes to maximize the learning potentials of MOOC. This study provides some insights into the effectiveness of MOOC and issues faced. Course designers should take the issues into consideration when designing MOOCs.

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Chapter 30
Changes in Students' Level of Awareness of Social Topics Through Project-Based Learning in the Intensive English Program at Taylor's Centre for Languages

Clarence Lim Kia Seng and Nur Ili Syazwani binti Mohd. Azhar

Abstract The purpose of this research is to investigate the impact of topics that are introduced in Taylor's Centre for Languages Intensive English Programs on students' mindsets. Each semester, a topic related to the well-being of the environment will be introduced in class and students are required to complete a project based on the topic provided. Upon their return from the excursion, the students will then conduct a research on it. In order to investigate whether there are any changes in students' level of awareness of a particular topic, a two-pronged approach is used to conduct this research. The first step is by issuing two sets of questionnaires to the students. The first questionnaire is given before the introduction of the topic and the other after the completion of the project. Through the questionnaires, it helps to identify students' views and level of awareness on the topic before and after the intervention of classroom teachings and the project. The study was conducted for the duration of 6 weeks, as the first questionnaire was distributed before the students begin work on their project and the second questionnaire was distributed after they completed their project in week 10 in order to compare their awareness of environmental topics before and after the project. The data gathered were tabulated using Statistical Package for the Social Sciences (SPSS) software.

Keywords Environment · Awareness · Project-based learning · ESL

C.L. Kia Seng (✉) · N.I.S. binti Mohd. Azhar
Centre for Languages, Taylor's University, Lakeside Campus.
No. 1, Jalan Taylor's, 47500 Subang Jaya, Selangor, Malaysia
e-mail: ClarenceKiaSeng.Lim@taylors.edu.my

N.I.S. binti Mohd. Azhar
e-mail: NurIliSyazwani.MohdAzhar@taylors.edu.my

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30.1 Introduction

ESL learning in higher education context brings about a myriad of challenges in educating the youth. There are many social issues that need to be addressed within the classroom in order to ensure that the students are equipped with knowledge not only for their respective fields and the workplace but also to prepare them with knowledge regarding the world that we live in. The kind of education we need begins with the recognition that the crisis of global ecology is first and foremost a crisis of values, ideas, perspectives, and knowledge, which makes it a crisis of education, not one in education (Orr, 1994). Higher learning institutions have some of the responsibilities in increasing not only knowledge and abilities but also consciousness and the values that are needed to create a sustainable future. They will understand the ecological services that are critical for human existence and how to make the ecological and social footprint of human activity visible and as benign as possible (Chambers, Simmons, & Wackernagel, 2000; Ryan & Durning, 1997). Also by bearing this responsibility, the institutions are not only producing products that can work, but also responsible for their environment.

This study aims to find out whether participants experienced any change in their level of awareness pertaining to social issues, specifically environmental issues. According to the Tbilisi conference declaration (1978), awareness can be defined as:

> *Awareness—to help social groups and individuals acquire an awareness sensitivity to the total environment and its allied problems (and/or issues)*

To find out whether or not there is a change in terms of what the students know about the environment, a project that specifically focuses on environmental issues was carried out. For this study, the hypothesis that will be tested is that a learner's awareness regarding social issues will increase after the completion of a problem-based project.

The research seeks to address the following questions:

1. Does a project-based task affect students' awareness level about social issues?
2. Are there any marked differences in their level of awareness before and after the project?

30.2 Literature Review

30.2.1 ESL Learning in Higher Education

As globalization begins to make its mark around the world creating opportunities and expansion for businesses worldwide, higher education is also expected to follow suit (Marginson, 2006; Luke, 2011; Hou, Montgomery, & McDowell, 2014). In fact, internationalization of higher education is not only happening in

developed countries, but some developing countries are also dedicating their resources to such initiatives (Peking University, 2014; Tianjin Foreign Studies University, 2014). Due to this, the ESL classrooms are seeing a more diverse group and this poses various challenges. As mentioned in the introduction, apart from English language acquisition, one other function of ESL classrooms is to equip students with knowledge beyond classroom application.

With students from such diverse background and culture, many ESL learners come with different knowledge and experience. For many of them, expressing their ideas and thoughts in an ESL classroom becomes a problem, and it has been proven by many that the most obvious problems in their studies stem from the lack of English proficiency which will in turn affect their academic performance (Lee, 1997; Mori, 2000).

30.2.2 Project-Based Learning

Project-based learning (PBL) is a method that is designed to allow students learn by performing a given task. This method encourages student-centred learning (Mergendoller, 2006). According to Holm (2011), PBL is a type of student-centred instruction where students take charge in choosing and creating a certain product or presentation that helps address realistic problems that the world is facing today. In PBL, students work within a stipulated time frame on a given project and will have full autonomy in deciding what they want to do. Teachers will act as a facilitator and guide students in their work in order to meet the learning objectives.

PBL as a teaching method is recognized by many academicians as the best methodology that engages students in their learning and, at the same time, develops students' critical thinking skill, teamwork as well as problem-solving skills (Berends, Boersma, & Weggemann, 2003; Holm, 2011; Scarbrough, Bresnen, Edelmann, & Laurent, 2004; Tsang, 2007). Compared to traditional methodologies that are more teacher-centric, PBL had proven that it enhances content knowledge and practical skills such as creative thinking and critical thinking skills (Holm, 2011). According to Helle et al. (2006), PBL also resulted in better acquisition of process and skill development as well as information literacy skills compared to traditional classroom learning. This is due to the fact that students get hands-on experience in the process of completing their project. The opportunities that stem from social interactions with people in and out of the class led to steeper learning curve as one gains knowledge and experience from not only the teacher in class but also experts in the field of their project. This is touted by Vygotsky's (1978) social interaction theory whereby students' learning is largely influenced by their environment and also guidance from their peer. Many supporters of PBL believe that collaborative skills such as critical thinking, teamwork, and problem-solving skills which are necessary in the workplace can be developed through PBL (David, 2008; Hart Research Associates, 2015).

Holm (2011) wrote about PBL having five distinctive features. In developing PBL, the first thing to do is to align it to a given curriculum (e.g. Intensive English Program). From then on, most of the learning material will revolve around the project that students will be completing. This is done in order to provide students with the required background knowledge. The second feature will be to create questions of importance for the project to be based on "driving questions" (Blumfield et al., 1991) so that students are engaged in a logical pursuit of knowledge in order to complete the project. It is highly important to note that the questions must be relevant to the content so that students will be able to engage with the main issue. The third feature that Holm (2011) noted is that the assignment must require students first to identify the problem, then develop solutions to it, and later on present their findings through a presentation or in a written report format. To further encourage students' participation, students can be encouraged to organize an event to present their work. Fourthly, as PBL is a student-centred method, students need to be given total autonomy in the process of the creation of their work. Instructors' or teachers' role is merely that of a facilitator that guide students in their work. Last of all, projects are meant to reflect a realistic problem that the world is facing and students work to identify and provide solutions to it.

Although PBL is useful in developing skill sets, one of the main challenges of PBL is that it requires students to take control of their learning. Many ESL instructors will find this difficult in an ESL classroom given that, first, it needs students to have a certain level of English proficiency in order to communicate. Besides that, some critics complained that student-centred learning that reduces the function of teachers to mere facilitators failed to encourage students to take charge of their own learning. Furthermore, there is no concrete evidence that PBL improved problem-solving skills (Holm, 2011). This might be true given that the Internet provides answers to numerous problems and all students need to do is just to spend a little bit of time to search for their answers online and they will be able to complete their PBL assignments. Nevertheless, critics missed out on the point that while students might not show immediate signs of problem-solving skills development, as students grow in age and maturity, the numerous experiences that they had gained in completing PBL task will lead to improvement in their ability to solve problems.

30.2.3 Environmental Awareness

As mentioned in introduction, ESL classrooms serve to provide not only language education but also content knowledge. Environmental issues topic is one that is quite prevalent in many ESL textbooks, but what remains unknown is the impact of incorporating environmental issues into ESL classrooms. According to Sinatra et al. (2012), having the driving force to act on one's beliefs is crucial for enforcing changes.

On the issue of environmental awareness, despite having numerous classes that teach about the various pollutions on earth, actions are still lacking. Therefore, it is

important to highlight the danger of this issue to students. Creating responsible adults will require educating students about climate change and the impact of humans on the environment (Christensen & Knezk, 2015). A research on utilizing persuasive text materials with college students to alter their behaviour and to influence their willingness to change found that students who are more inclined to the idea of climate change are prone to take action on the issue of climate change (Sinatra et al., 2012).

On the other hand, Bradley, Waliczek, and Zajicek (1999), McMillan, Wright, and Beazley (2004) found that exposure towards environment content knowledge led to a more positive outcome and increased responsibility towards the environment in individuals. Despite that, a multinational study failed to prove the connection between having knowledge of climate change will lead to a change in behaviour towards the environment (Dijkstra & Goedhart, 2012).

30.3 Methodology

30.3.1 Methods of Data Analysis: Quantitative

For this study, the researchers took the questionnaire and did a quantitative analysis of it. Due to the low sample size, paired t-test was used to analyse the data. A total of 71 participants were administered two sets of questionnaires. The first set of questionnaire was distributed to the students early in the semester to determine their awareness of the project that they would be doing in week 7 of their semester. Another questionnaire was administered after the students got back from their field trip. The reason the two sets of questionnaire are the same is due to the fact that the questionnaires basically were looking for changes in students' attitude towards Mother Nature both before and after having completed a project which was related to the environment. The other reason for using the same set of questions was because of fairness. By using a different set of questions, a fair comparison will not be achievable as the items may vary. Therefore, in order to procure fair comparison, both sets of questionnaires would have to be the same. Furthermore, with both questionnaires being administered at least 6 weeks apart, participants' memory of the first questionnaire would have less influences on the second set of questionnaire.

30.3.2 Reliability and Validity

A "pilot study" was conducted beforehand to evaluate the validity and reliability of the questionnaire and the responses. The questionnaire was set up in order to assess the relevancy and the understanding of questions and modified based on reliability scores. In the final revision, some questions were omitted due to redundancies, and some were rephrased for easy understanding of questionnaire. The reliability of

Table 30.1 Reliability statistics

Cronbach's alpha	No. of items
0.675	15

Table 30.2 Item–total statistics

	Cronbach's alpha of item deleted
q1	0.613
q2	0.643
q3	0.646
q4	0.622
q5	0.646
q6	0.638
q7	0.691
q8	0.676
q9	0.666
q10	0.640
q11	0.679
q12	0.665
q13	0.673
q14	0.676
q15	0.698

questions was tested by Cronbach's alpha. The value of Cronbach's alpha for all items exceeded the allowable cut value of 0.60 (Farrell, 2009), ranged from 0.613 to 0.698 which is greater than 0.60, and therefore, the reliability of questionnaire is supported. An overall result of "Cronbach's alpha" is 0.675, which exceeded 0.60 (Tables 30.1 and 30.2).

30.3.3 Ethics

All the students who took part in this project were informed about the study beforehand. All the participants voluntarily answered two questionnaires: one before the trip and another upon the completion of the project. All questionnaires were answered anonymously.

30.3.4 Instrument

A new questionnaire was developed for the purpose of this study. The questionnaire consists of 15 items with each being rated with a 5-part Likert scale. The questionnaire was piloted with a selected number of students to test the language

difficulty of each item as the participants have English language proficiency at the level of lower intermediate to upper Intermediate. The purpose of piloting it is to ensure that participants were fully able to understand each of the questions asked to them. The questionnaires' focus is on environmental issues as it will be used in their PBL task and it was administered formally in week 3 and week 9, respectively.

30.3.5 Sample

Seventy-one students took part in the project and completed the questionnaire. Their ages ranged from 18 to 31. The students are from various countries: Malaysia, Indonesia, Kazakhstan, Japan, Korea, and the Middle East. About 50.7% of the samples are females, while the remaining 49.3% are males.

30.3.6 Location

This project was conducted at Taylor's University Lakeside Campus. The students who attended the English course did so in order to improve their English level before entering into the main university courses to study courses such as business, hospitality, law, and design.

30.3.7 Duration

The students were enrolled in a 12-week intensive English course. The course was commenced in April 2016 and completed in July 2016. The project itself was carried out in week 7 when the students embark on a field trip; they began their project the following week which was week 8; they completed the project in week 10. The first questionnaire was given out in week 4, and the second questionnaire was distributed in week 10.

30.4 Data Analysis

In this section, the demographic data and the paired t-test score of both the questionnaires will be presented. As the distribution of the samples is greater than 30, the distribution of the data is approximately normal (Fig. 30.1; Tables 30.3, 30.4 and 30.5).

According to the result of paired sample *t*-test, there is a significant difference between before and after the completion of the project ($t = 4.385$,

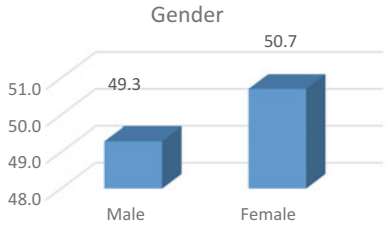

Fig. 30.1 Demographic characteristics

Table 30.3 Paired sample statistics

		Mean	N	Std. deviation	Std. error mean
Pair 1	Before	2.2427	71	0.41188	0.04888
	After	2.2179	71	0.41977	0.04982

Table 30.4 Paired sample correlations

		N	Correlation	Sig.
Pair 1	Before and after	71	0.994	0.000

Table 30.5 Paired sample test

		Paired differences					*t*	*df*	Sig. (2-tailed)
		Mean	Std. deviation	Std. error mean	95% confidence interval of the difference				
					Lower	Upper			
Pair 1	Before and after	0.02479	0.04763	0.00565	0.01351	0.03606	4.385	70	0.000

p value = 0.000 < 0.05). This means that PBL had substantial impact on students' awareness towards the environment. The result shows that students become more aware of the numerous environmental issues around them. This awareness may then possibly be transferred into action that will have positive impact on the society as a whole.

30.5 Discussion

The study was conducted on Taylor's University Intensive English Program students. The purpose was to look at the students' perception towards social issues that they are surrounded with. The purpose of choosing conservation theme was because it was easily accessible within Taylor's University. In the first questionnaire that

was administered, students showed concern about the environment. Despite that, there were groups of students who were not concerned about the current issues in relation to the climate or environment. Out of the 71 students surveyed, 13 students have never been exposed to stories related to environmental problems, while 20 students have never done any research on environmental issues. There are 11 students who do not think that climate change is an issue at all. It is also quite alarming that many students had neutral stance on the condition of the environment and do not feel the need to be concern about the changes in the environment.

After 6 weeks of classes and when the students had completed their PBL task, there were some changes in their opinion with regard to their previous stance on environment. This could be due to the fact that they have now been exposed to news and problems that stem from environmental issues. They are now able to relate to the cause and effect of environmental pollution as well as climate change.

These changes could also be seen in their behaviour within the classroom. Rubbish used to be scattered around the classrooms, now it is left in trash cans. There were also instances of students sorting out the rubbish and putting them into the relevant recycling bins. From the changes in behaviour, it can be concluded that PBL tasks do have impact on students.

Although the impact can be seen in the behavioural changes of students, one concern will be the sustainability of the changes. The reason that made students change their behaviour can be tied to their learning, but at the same time, it can also be caused by the role of the teachers in the class which at times function to enforce students to clean up after themselves. Therefore, a longitude study on the long-term effect of the behaviour will be able to reveal the real effect of PBL.

30.6 Conclusion

This study begins with the identification of two research questions: (1) Does a project-based task affect students' awareness level about social issues? (2) Are there any marked differences in their level of awareness before and after the project? As this is a quantitative study, answers to both questions were captured in the questionnaires that were distributed to the participants. The study found that getting the students to do a project-based task related to environmental issues increased their level of awareness about it. Therefore, it is safe to say that having a PBL task in ESL classroom will definitely impact students' perception on social issues that are prevalent in the society. There is also a stark contrast in students' awareness before and after the project. Data revealed that students are more conscious of environmental problems after the completion of project, and many of them showed signs of improved behaviour towards Mother Nature.

Although the data that were captured showed positive signs in students' cognizance towards ecological issues, it remains to be seen whether this awareness will

be transferred into action that protects the environment. It is also important to note that as habits are hard to change, students might still revert back to their old ways of not being concerned about the environment.

30.7 Future Research

Through the execution of this project, it can be seen that there is an increase in students' level of awareness regarding environmental topics. Through their research, the students were able to learn more about topics that otherwise be of no interest to them. When the learners are motivated to complete a task, their attitudes and affective states influence the degree of effort that the learners are going to practise English language (Ellis, 2006). Through this project, the students were able to conduct their own research on various topics pertaining to the environment. Students have opportunities to use several skills such as problem-solving, creativity, teamwork, and language at different work stages, so the work and language skills are developed (Brunetti, Petrell, & Sawada, 2003; Solomon, 2003). In doing so, they had to find information, analyse the information, and share their findings with their classmates. This gave them a chance to also use the language and allowed them to overcome language barriers that they may have faced while completing the project. For future research, there is an opportunity to explore not only the increase in their level of awareness but also how their language skills improve before, during, and after the project takes place.

Apart from looking at language skills, further research can also look at expanding the study that observes the students' ability to understand the subject matter. Gallagher, Stepien, Sher, and Workman (1995) reported the successful use of the model with fifth-grade students on problems relating to 13 the ecosystem. By doing so, students not only will gain awareness regarding the environment but may also understand in complexity the issues that they researched on for their project. Furthermore, Shepherd (1998) reported that problem-based learning can have a positive effect on students' acquisition of critical thinking skills. This will in turn provide an insight into students' ability to think critically in completing their projects and tasks in the future.

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Chapter 31
The Journey of TGCSP with Special Attention on Service Learning

Siow Chun Lim, Satesh Namasivayam and Chockalingam Aravind Vaithilingam

Abstract Service learning has picked up momentum in the engineering education field over the past decade due to its two pronged benefits to the students' learning experience as well as to the community. While it is usually embedded within the curriculum in terms of execution, the Taylor's Grand Challenge Scholars Programme (TGCSP) runs it in parallel with formal curriculum. TGCSP was developed to nurture holistic engineers capable of addressing the grand challenges defined by the National Academy of Engineering (NAE), USA, which stand in the way for humankind's survival of the next century. Service learning is the fifth programme outcome (GCPO5) of TGCSP which scholars must attain in order for them to be able to graduate with TGCSP certification which is endorsed by NAE. This paper outlines the structure of implementation and assessment of GCPO5. In addition, the scholars' perception on how their journey towards attainment of GCPO5 has impacted their learning experience will also be discoursed.

Keywords Service learning · Grand challenges · Holistic education · Engineering education

31.1 Introduction

In 2008, the National Academy of Engineering (NAE) has identified 14 Grand Challenges for Engineering in the twenty-first-century engineers globally must overcome in order for humankind to survive the next century. In line with this,

S.C. Lim (✉)
Multimedia University, Cyberjaya, Malaysia
e-mail: chunlim87@gmail.com

S. Namasivayam · C.A. Vaithilingam
Taylor's University, Subang Jaya, Malaysia
e-mail: SateshNarayana.Namasivayam@taylors.edu.my

C.A. Vaithilingam
e-mail: aravind_147@yahoo.com

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several academic institutions in the North America have established the Grand Challenges Scholars' Programme with the primary aim of producing students who are capable of addressing the 14 Grand Challenges. In March 2015, Taylor's University School of Engineering has gained formal approval and recognition by the NAE to run Taylor's Grand Challenge Scholars Programme (TGCSP).

There are 5 grand challenge programme outcomes (GCPOs) which students must attain in order to graduate as a TGCSP scholar with certification by the NAE. They are as follows:

GCPO 1: Grand Challenge Project: scholars have to undertake and complete projects related to their grand challenge (GC) of choice
GCPO 2: Interdisciplinary Knowledge: scholars have to undertake and complete courses in other non-engineering fields which complement with their engineering knowledge to enable them to address their GC of choice
GCPO 3: Entrepreneurial Experience: scholars have to complete an activity closely related to an entrepreneurial experience
GCPO 4: International Exposure: scholars have to develop global perspective necessary to address their GC
GCPO 5: Service Learning: scholars have to assume leadership roles in undertaking service-oriented activity which benefits the underprivileged community.

The pedagogy in engineering education has been gradually transforming globally for the past decade. There has been a paradigm shift towards student-centred learning with increasing emphasis on the development of soft skills. Branching out of this realm of soft skill development, project-based service learning (PBSL) has gained increasing practice intensity worldwide especially in undergraduate engineering courses (Coyle, Jamieson, & Oakes, 2005). PBSL is a form of active and experiential learning which encourages students to work on projects by applying knowledge and skills learned academically and the projects undertaken should benefit a community while also enriching their learning experience (James, Burke, Jean Newman, & Sandy, 2001). It is actually learner-centred as the leadership and execution are all done by the learners. Service learning was also found to be positively or at the very least neutrally influences academic achievement (Gallini & Moely, 2003).

Many programmes embedded PBSL into their formal curriculum (Alexander, Lori Vogelgesang, Elaine Ikeda, & Jennifer Yee, 2000). In other words, PBSL tags along some of the modules and students gain credits upon passing such modules. However, TGCSP is a unique programme in the sense that it runs in parallel with the formal engineering curriculum with participation of engineering student taking place on a purely voluntary basis. Upon graduation, TGCSP scholars will obtain an additional certification by NAE provided that they fulfil the 5 GCPOs.

In this paper, the programme structure and the assessment mechanism of the service learning component (GCPO5) of TGCSP will be outlined. Perception of the scholars on how service learning has impacted their learning experience will also be evaluated.

31.2 Programme Structure and Assessment Mechanism

The TGCSP structure consists of the scholars and several academic mentors. Each academic mentor would be assigned to mentor on the average three to five scholars. At the beginning of each semester, students who are interested to join TGCSP will tender in their application forms. Then, they will be interviewed by their prospective mentors. Once accepted into the programme, the scholars will have to first identify their grand challenge of choice and then engage in regular meeting with their mentors to plan out how they intend to close the five GCPOs while keeping the alignment with their grand challenge of choice intact. At first glance, the role of a mentor seems minimal as the planning and execution of learning activities were all done by the scholars. However, the academic mentors play a vital part especially in assisting mentees to see and concretize the learning outcomes that they may acquire unknowingly.

Implementing such form of learning as a formalized programme faces huge challenge in the assessment stage as unlike conventional engineering curriculum, there is higher degree of subjectivity and uncertainty to decide whether a scholar has done enough to close a GCPO. Hence, the assessment mechanism being currently practised in TGCSP with respect to closing GCPO5 is now outlined.

Firstly, scholars have to compile the service learning activities in the logbook and meet their mentors regularly to discuss their progress and ensure that they stay aligned towards addressing their GC of choice. When the mentor and the scholar reached a consensus whereby the latter has done enough work to attain GCPO5, the scholars will then have to produce a comprehensive portfolio detailing the extent, breadth and depth of their work with regard to closing GCPO5. Scholars will then have to verbally present the portfolio at a town hall meeting with the rest of the scholars and all mentors. A panel of mentors which comprise of the academic lecturers will be judging and assessing the scholars based on a rubric as shown in Table 31.1. Scholars are also required to perform a self-assessment based on the rubric shown in Table 31.2 at the end of every system. This self-assessment is important for the scholars to reflect on their current progress as well as for their mentors to keep track of their progress.

For the record, only one such town hall with the aim of assessing the closure of GCPOs of scholars has been held thus far in July 2016. In addition to the academic mentors, the Global Chair and Director of the National Academy of Engineering Grand Challenges Scholars and K12 Partners Programme were also present to add rigour and significance to the assessment. The town hall concluded with five scholars is being recognized to be successfully closing GCPO5. Three of the five scholars have in fact managed to successfully close all five GCPOs and will be the first graduating cohort to be accorded with the certification by NAE. The next section briefly describes the service learning activities completed by the scholars thus far.

Table 31.1 Presentation and portfolio rubric (for relevant closure of GCPOs)

Area	Column (1)—outstanding: 5/5 marks	Column (2)—meets expectations: 3/5 marks	Column (3)—needs improvement: 1/5 marks	Strengths and opportunities for improvement
Presentation content and structure—weightage 15%	• Well-structured presentation with clear and logical flow • Presentation material is clearly organized, and all content relates to the relevant areas • Presentation material is relevant and provides a conclusion by highlighting relevant evidences • Slides are clear and creatively designed	• The presentation has a majority of the aspects described under column	• The presentation has none of the aspects described under column	<to be filled in by assessor (s)>
Presentation skills—weightage 15%	• Presenter is fluent and articulate as well as has good grammar • Varies tone of voice and the presentation is well pace • Maintains eye contact and good presentation gesture • Has a good level of confidence and is motivated • Good time management—within 30 min	• The presenter has a majority of the aspects described under column	• The presenter has none of the aspects described under column	<to be filled in by assessor (s)>
Depth and breadth of analysis (which must be detailed in the portfolio and substantiated with evidence)—weightage 70%	• The scholar executed a logical and consistent plan to meet the relevant PO • The scholar actively engaged himself or herself with all stakeholders for any activities related to the relevant PO. This involves learning from each other • The scholar produces thought, sharing and reflections individually and as part of a group • Reflections show affective growth regarding self in community • The scholar has shown the application and evaluation of relevant knowledge, skills and attitude gained in his/her degree in attempting to close the relevant PO(s)	The portfolio captures a majority of the aspects described under column	The portfolio has none of the aspects described under column	<to be filled in by assessor (s)>

Table 31.2 Self-assessment surveys (taken at the end of every semester)

Question	Not confident				Very confident
	1	2	3	4	5
I am confident that I will address the relevant PO(s)					
I am confident that I will address a grand challenge					
The activities I have accomplished thus far have allowed me to enhance my knowledge, skills and attitude relating to the grand challenges					
I am confident that I work better as an individual and in a team after becoming a scholar					
I am confident that I will graduate on time as a scholar					

31.3 Service Learning Activities

Having only started in the year 2015, the scholars of TGCSP have completed a considerable amount of activities related to GCPO5 and aligned to their GC of choice. The service learning activities are conducted with the aim of benefiting the underprivileged communities. Scholars are expected to assume leadership in organizing such activities in order to be qualified to attain GCPO5. Examples of activities completed by scholars to address service learning component include the following:

- The EPIC Homes programme: scholars have successfully crowd funded RM40, 000 via a collaborative effort with students from the University of Birmingham to then build a house for an indigenous family in Perak, Malaysia. The scholars have also presented simple engineering solutions aligned to their respective GC of choice such as a simple water filtration system to the family.
- Engineering My Future community service initiatives: scholars have successfully organized "Engineering My Future (EMF 1.0) and (EMF 2.0)" in December 2015 and July 2016, respectively. EMF is a community service initiative aimed at exposing underprivileged children to engineering and the 14 Grand Challenges. EMF 1.0 has served a group of orphans, while EMF 2.0 has benefited a group of youth from broken families.
- Project "Chasing Light": Scholars created a platform for young minds or more specifically a group of underprivileged children from a welfare association to explore the unorthodox but practical methods to learn and understand the journey of education.
- Community service activity organized by SPEED at Bangalore, India: scholars engaged and presented simple engineering solutions to common everyday issues to a group of local primary school students.
- Voluntary work in Cambodia: scholars helped to install the lightning system for the refurbishment of a school in.

31.4 Impact of GCPO5 on Learning Experience

A survey was conducted to gauge the perception of the scholars on how participating in service learning activities has impacted their learning experience. An online survey form was created and shared to the scholars through their respective mentor. The survey form was formulated based on culmination of several related research papers (Coyle, Jamieson, & Oakes, 2005) (Mushtak & Tong, 2013). Ten out of the total thirty-six TGCSP scholars have responded. This relatively low response rate could be due to the fact that only four of the total number of scholars were in their final years of studies at the point of this survey. The relatively more junior scholars of semester 6 and below probably were not motivated to complete the survey due to their still lack of participation in service learning activities. Three out of the four final year scholars have responded. Out of the ten respondents, seven have experience with service learning activities prior to joining TGCSP. Only one scholar has not participated in any service learning activity yet upon joining TGCSP.

Table 31.3 summarizes the mean score of each survey item. The score is based on a Likert scale of 1–5 with 1 being strongly disagreed while 5 being strongly agreed with the survey item.

It can be inferred from Table 31.3 that the respondents generally are of the view that participating in service learning activities has contributed positively to their learning experience. The low mean score on the second item is probably due to the challenge that many scholars are facing in aligning the activities that they have completed towards their grand challenge of choice. In terms of soft skills attainment such as problem-solving, leadership and teamwork, the respondents are of the opinion that performing service learning activities can assist in the acquisition of such skills.

Table 31.3 Survey results

Survey item	Mean score
I have academically benefited by participating in service learning activities while being in TGCSP	3.9
Participating in service learning activities motivated me to address my grand challenge of choice	3.5
Participating in service learning activities improved my problem-solving skills	4
Participating in service learning activities improved my leadership skill	4.4
Participating in service learning activities developed my awareness of social responsibility as an engineer/engineering student	4.3
Participating in service learning activities improved my ability to work in a team	4.3
Participating in service learning activities is a fulfilling and rewarding learning experience	4.2

Table 31.4 Scholar's perception on service learning activities

Response number	Response
1	Service learning activities made me realize that leadership skills are not just leading a group of people to work for you, but to lead to empower ourselves and others to be better
2	I have learned things that normally would not and could not be taught in a classroom. I have learned how to apply the engineering knowledge I've acquired to solve real-life challenges
3	I've learn to actually manage events and connect with people. Things that I cannot do in a classroom
4	I learnt not to take things for granted, and we need to serve the community if we have the capability
5	Remind me that as an engineer we are also responsible to solve problems regarding human welfare and also it is our obligation to contribute back to the society with the knowledge gained
6	I learn that we should be grateful for what we have because some children do not even have the privilege to be educated
7	The living style of other people makes impact on my life and makes me realize the important of learning towards the successful road
8	I cannot really tell because I did not really have much
9	Seeing the impact of empowering less fortunate kids in activities which would benefit them in the future is very fulfilling
10	Service learning activities allow me to identify the needs and demands of the current society

Table 31.4 illustrates the qualitative responses of the scholars who took part in the survey. Scholars were tasked to elaborate on how participating in service learning activities has impacted their learning experience. Nine of the ten responses are positive in nature in the sense that they imply that service learning activities can actually benefit both the doers in terms of learning soft skills as well as benefiting the underprivileged communities.

31.5 Conclusion

The assessment mechanism in TGCSP with respect to the closure of GCPO5 has been outlined. This may serve as a reference for engineering schools worldwide which intend to run GCSP as a formal programme with a structured assessment process. In addition, scholars generally agreed that participating in service learning activities has positively impacted their learning experience. As TGCSP is still relatively new with less than 5% of the total population of engineering students being scholars, similar study should be replicated in future once the programme matures with more scholars being the members.

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Chapter 32
Community Coworking Spaces: The Community New Learning Space in Thailand

Kamolrat Intaratat

Abstract Thai society has applied computer innovation into government agencies since 1963. Reforming public sector in 2002, the Thai government established Ministry of Information and Communication to take account for promoting, developing, and operating any activities of information technology and communication, including all kinds of development projects. ICT has been transforming all kinds of development including the community learning spaces all over the countries. Since 2006, MICT (Ministry of Information Communication and Technology) has trained both off-line and online 348,820 Thai marginalized people especially in the communities from all over the country along with its widely popular in mobile technology. This reflects demands of transformation in public service from government centric to citizen centric affected to the demands of new paradigm shift of Thai telecenter to be the community-centric center where its key findings of successful transformation are the Partnership strategy among all stakeholders; the Integrated strategy to serve all kinds of contextualized demands of the community; and its simplified applications to fit serve the real demands of the community participatory conveyed by all kinds of online social media. This would make possible by leveraging the network of over 2000++ telecenters, 600++ Community Digital Services Centers, and the ongoing 70,000 Smart Village Hubs as being the community new learning space.

Keywords ■■■

32.1 Background

For over a decade, Thailand has been internationally recognized as a regional center for ICT growth and development, and its ICT Policy Framework has been an exemplary model for the development of effective telecommunications and ICT regulatory environment (ITU, 2015).

K. Intaratat (✉)
CCDKM, Sukhothai Thammathirat Open University, Pak Kret, Thailand

S.F. Tang and S.E. Cheah (eds.), *Redesigning Learning for Greater Social Impact*, DOI 10.1007/978-981-10-4223-2_32

In 1995, the country launched an ambitious project to address the goal of ensuring access to education for all through technology. In 2002, the National ICT Master Plan, a comprehensive policy framework for ICT development, was created and the Ministry of Information and Communication Technology (MICT) was established. Since the policies were enacted, there has been a tremendous boost for the ICT sector. In recent years, both the Ministry of Information and Communication Technology (MICT) and the Ministry of Education (MOE) have set development plans to build both infrastructure and people's ICT literacy with the mission to "create a labor force of adequate ICT professionals that are knowledgeable, skilled, and information literate, in order to develop Thailand in a sustainable and stable knowledge-and-innovation-based society" (CCDKM, 2009).

A new policy framework called Smart Thailand 2020 was introduced in 2014. The principal objective of the new plan is to boost accessibility, making ICTs a basic commodity for the entire country through ongoing improvements in infrastructure and increased mobile broadband penetration. Thailand recognizes that ICT literacy provides opportunities for the public including all the marginalized people from all over the country to fully and equally participate in the digital economy and society, and exercise their right to speak, share ideas, access information, and build knowledge. The existing 2000++ telecenters scattered across the country and set up at sub-district administrative offices, community centers, healthcare centers, schools, and the USO NET Community Centers, and provided access to ICTs and the Internet in rural and remote areas with a focus on digital literacy. Furthermore, thus far, Smart Thailand has also resulted in the establishment of some 400,000 public Wi-fi access points (ITU, 2015). These developments are expected to continue as the country becomes a leader in ICT development in ASEAN.

The MICT (Ministry of Information Communication and Technology) is the core organization whom aware that there is a growing demand, especially from youths and small medium entrepreneurs, for scaling up the existing telecenters and offering more friendly innovation and coworking spaces or *SMART hubs*. These are places where people can come together, generate ideas and solutions, learn new knowledge and skills, get assistance on how to set up their local businesses, establish strong networks and have access to skilled personnel, and e-learning resources (MOOCs), among others. Along with its core policy of Thailand 4.0, ICT got its tangible roles to serve all the growing up demands with high expectations concerning the improvement of the socioeconomic conditions in the current knowledge economy. The Ministry of Digital Economy and Society, Thailand (previously is the Ministry of ICT), has put all supports in this growing demand, especially among all kinds of small medium entrepreneurs to survive under either the knowledge economy, the digital economy, or the creative economy (Intaratat, 2016).

E-services play a significant role in development by accelerating public service delivery, improving government accountability, encouraging civil participation in decision-making processes, boosting the digital economy, among others. However, unless rural people are empowered with digital literacy and entrepreneurial skills, they will remain digitally excluded and marginalized in terms of access and use of

ICT. CCDKM has developed culture- and context-sensitive curricula on entrepreneurship skills for rural communities, using simple and effective strategies to help them join global market places and link with buyers to sell their products nationally and internationally through mobile technology. Through multi-stakeholders' partnerships, training of the trainers' courses has been conducted nationwide and rural communities are increasingly using ICT to reach out and collaborate with national, regional, and international organizations to implement their local sustainable development projects and initiatives. Their English language is also improving! An essential added value when working in the ASEAN Economic Community.

However, with its evidence base, there are several challenges when it comes to telecenters in Thailand; for instance, how to ensure their sufficient sustainability, organizational stability, and programmatic flexibility to allow these spaces to survive once the immediate round of funding allocated for their setup runs out. In fact, many telecenters in Thailand have shut down and there is growing awareness that the first generation of telecenters which provided a basis for introducing the Internet and basic ICT literacy (particularly in rural areas and among marginalized and disadvantaged groups) has now become obsolete while ICT has been growing up in its high expectations concerning the improvement of the socioeconomic conditions in the current knowledge economy. How can telecenter or the ICT learning centers could be a place where people can come together, generate ideas and solutions, learn new knowledge and skills, get assistance on how to set up their local businesses, establish strong networks, and have access to all demanded skills.

So, this Participatory Action Development study has been synthesized from all success and ongoing telecenters in Thailand and in the region aims to transform the existing telecenter to serve as its next-generation telecenter: the community smart hubs which could be benefited to all, not only in Thailand but also in other ASEAN member countries. Showcases or case base studies have been synthesized from all levels of stakeholders.

32.2 Success Stories of Community Co-working Spaces

Some of the various cases of telecenter or the smart learning centers were picked up to be as case studies as follows:

1. **Thai Telecenter**

Since 2006, MICT has supported CCDKM to train both off-line and online 348,820 Thai marginalized people, ensuring gender equality. This was made possible by leveraging the network of over 2000 telecenters scattered all over the country.

From 2013 to 2015, 80,000++ people have been trained on digital literacy and entrepreneurship skills. The Ministry of Information and Communication

Picture 32.1 Farm community learning among themselves via their mobile devices (CCDKM, 2016)

Technology of Thailand (MICT) is the main supporter of these projects under the priorities of the Digital Economy Policy Plan Pillar 4, namely digital e-commerce, digital entrepreneurs, digital innovation, and digital contents. These developments are expected to continue as Thailand is one among the countries to become a leader in ICT development in this ASEAN region because its current concrete policy of Thailand 4.0 aims to transforming Thailand into the digital country. So, the scaling up of all existing telecenters to offer more friendly and applicable innovation as a community SMART hub where people can come together, generate ideas and solutions, learn new knowledge and skills, get assistance on how to set up their local businesses, establish strong networks and have access to skilled personnel, and all kinds of e-Learning resources such as MOOCs, among each other and others both in Thailand itself and also among the other ASEAN member countries (Picture 32.1).

2. **SAFSeN**

SAFSeN (Southeast Asian Council for Food Security & Fair Trade) is an ICT learning-based platform designed to provide agricultural tips on appropriate technology to rural small-scale farmers in ASEAN; bridge gaps in educational and literacy levels; narrow the digital divide (gender and geographic); link and network ASEAN farmers; and enhance food security through sustainable agriculture technologies. The SAFSeN training course created by CCDKM is available in English, Thai, Bahasa, Malay, and Vietnamese. It teaches farmers how to use the ICT platform; write content; and report stories from the field; shoot, edit, and upload photographs on the Web; use Facebook and Line to share and communicate information on sustainable agriculture technologies. CCDKM has trained both online and off-line 5000 farmers in Thailand and Laos. For most farmers, it was their first time to use social media to raise awareness about their work. Furthermore,

their English literacy skills also improved. After the successful outcomes of this project, Thailand's *SMART Farmers* model was taken as an example in the ASEAN region. SMART Farmers from northern Thailand trained 37 Cambodian farmers and in partnership with CCDKM and Oxfam, launched the first two community innovation centers (CCICs), in Pursat and Takeo provinces. The project aims to improve the digital literacy capacity of Cambodian farmers; empower them with access to important information sources, including crop choice, weed control, environment and climate change, weather information, markets; and promote nationally and regionally their own stories, products, and services.

3. **Cambodia Community Innovation Center (CCIC)**

In 2015, CCDKM and OXFAM US in Cambodia launched and piloted a project to set up the first two community innovation centers (CICs), in Pursat and Takeo provinces. The project aims to improve the capacity of farmers on how to use information and communication technology (ICT) to voice out their concerns and promote their agricultural work and methods.

The CCICs have been equipped with computers, LCD projectors, and Internet by Oxfam and its partners—RACHANA and SREI Khmer, and are being managed by a farmers' committee that will ensure their sustainability. "We are learning how to type in Khmer to accept registrations for the training and the small fees will ensure the smooth running of our Center, paying for electricity and maintenance costs," said Noun, a member of the service team.

While sitting in plastic chairs and happily waiting for the opening of the Cambodia Community Innovation Center (CCIC) in the remote village of Sareng, Pursat province, students and farmers, especially women, are excited to register for the first time in their life to computer and Internet courses. For women farmers, the center offers unprecedented opportunities since they have never received basic education and training on technology skills. "While growing up and then having children, I never had the time and opportunity to explore and experiment with technologies. CCIC, which is conveniently located near my house, is my first step into the modern world," said Oun Korn, a 35-year-old woman farmer, who has never put her hands on a computer before.

Many women farmers who attended the opening also recognized the business and educational opportunities brought by new technologies, not only for themselves, but also for their children. "My parents are farmers and since it is expensive to commute to provincial towns to attend computer classes, having the Innovation Center right next to my house is a dream come true!" said Hay Sokchea, a 16-year-old student.

CCIC offers villagers access to Internet and relevant information on agriculture market prices, knowledge, research, and new technologies. Trainers also teach farmers about Facebook and how to upload their stories, photographs, and videos to promote their community products online. "The Center has arrived at the right time! I want to use Facebook to advertise my products, and those of my community; in particular, our original rice seeds from Sareng village," said Noun (Picture 32.2).

Picture 32.2 Cambodian small farmers learning to use computer to seek their farm information (CCDKM, 2016)

Oun Noun, 31-year-old farmer and a member of the service team, tried to use the computer for the first time at the opening of Cambodia Community Innovation Center (CCIC) in Pursat province.

Chei Eth, a 27-year-old farmer and a member of the service team, wants to learn how to use the Internet to search for news and information from Cambodia and the world and share her stories with others. "I want to promote the work of my service team and our products to other farmers outside the village. Until now, it was very difficult to share our stories and sell our products to people outside the village because we didn't have the technology and the skills to do so. We had to walk from village to village. This center will not only benefit my generation; it will also empower my children's generation."

4. Community-Based Tourism: Community Smart Tourism

The Local Tourism-based Learning and socializing Center: the Very Local Trip Community-based Tourism project integrates the social, economic, and environmental dimensions of development by enhancing the capacities of local artisans and farmers to use ICT and media, to promote and conserve cultural and environmental heritage, including arts and crafts and sustainable Thai agriculture and organic farming methods. The project also contributes to the promotion of Thailand's digital economy, in particular *ICT, Tourism and Sustainable Development* by facilitating the involvement of Thai local people and communities in tourism development around natural and cultural heritage sites; establishing business linkages (online and off-line) between local communities, tourism enterprises, and visitors; providing communication and marketing e-services on local tourism in Thailand; improving the quality of tourism experiences at the local level; and strengthening the capacities of local guides on how to use ICT to promote their local experiences on Very Local Trip Web platform (Picture 32.3).

Picture 32.3 Local community share their local wisdom to others with pride (CCDKM, 2016)

5. **Crafts: The Community Smart Learning Crafts**

The Community Crafts Learning and socializing Center occurs to meet the demands of the marginalized home-based workers who widespread in all regions of Thailand. Out of 249,290 households, there are 440,251 people earning their livelihood through homeworking. Of this number, 337,526 are women; more than half are uneducated or just attended primary schooling and have been victims of abuses and marginalization. Most homeworkers use their houses as the workplace for producing textiles and garments, wood products, basketry, artificial flower making, food processing, leather goods and plastics, jewelry, and then deliver them to the employers or business mediators. This is not the same as production for direct sale. Through the WE. STYLE. FOR A CAUSE initiative, CCDKM has met the demand of thousands of women homeworkers to upgrade through ICT, their entrepreneurial, design, and styling skills to fit the trends and requirements of international and regional markets. For the first time in Thailand, local and international trainers, fashion and lifestyle experts, have joined forces to deliver an innovative, practical and community friendly pedagogy based on hands-on experience and collaborative learning. Over 200 women have already benefited from the free simplified trainings on how to build a brand, business communication, social media for business, smartphone photography, product pictures and retouching for commercial use, landscape and tourism photography, financial literacy, and online business solutions to sell products directly to customers (Picture 32.4).

6. **SAB—Safety Agri Buriram**

The Community Smart Farm Learning and socializing Center occurs to meet the demands of the small farmers as well as the policy demands of the Thai government

Picture 32.4 Craft community learning and sharing among themselves to utilize ICTs for their SME (CCDKM, 2016)

to work under the Partnership Model among all stakeholders. "SAB" has been designed to serve all those demands as a social enterprise and creative space where farmers can link and exchange about organic farming, food safety, and sustainable agriculture methods. Dr. Nucharaporn Kritreongroj, founder of SAB, has linked other sectors with this Community Smart Learning Hub too. Akelada Hotel and the Dr. Surachet Hospital as the services corporate partners in collaboration with The Nat Space and The Research Center of Communication and Development Knowledge Management (CCDKM) developed this concept where farmers, stakeholders, and members of the ASEAN community can exchange and find new solutions related to fair trade, farmers' market price, and sustainable farming methods to achieve good crop yields without harming the natural environment or the people who live and work in it (Pictures 32.5 and 32.6).

Picture 32.5 Social Enterprise (*S.E.*) farm community learning model (from farm to table with safety) (CCDKM, 2016)

Picture 32.6 Smart community learning hub with its entrepreneurs and S. E. model both for real serve and sustain itself (CCDKM, 2016)

7. **The NAT Space—The Community Coworking Space, Buriram**

THE NAT SPACE is a community coworking space represented **N**: Nature, **A**: Agriculture, **T**: Technology designed for communities who want to learn and access ICT to improve their business and entrepreneurial skills and expand their knowledge and expertise in different sectors such as sustainable tourism, agriculture, digital literacy, edutainment, online education, and e-business solutions. "THE NAT SPACE" has been collaboratively designed to serve all those demands as a social enterprise and creative space to serve communities as their community-based products, farm outlet, local wisdom hub besides from its core digital serve, and learning space.

32.3 Conclusion

Thai government established Ministry of Information and Communication (MICT) to take account for promoting, developing, and operating any activities of information technology and communication, including all kinds of development projects. ICT has been transforming all kinds of development including the community learning spaces all over the countries.

Since 2006, MICT (Ministry of Information Communication and Technology) has trained both off-line and online 348,820 Thai marginalized people especially in the communities from all over the country. The existing 2000++ telecenters scattered across the country and set up at sub-district administrative offices, community centers, healthcare centers, schools, and the USO NET Community Centers, provide access to ICT and the Internet in rural and remote areas with a focus on digital literacy. Furthermore, thus far, Smart Thailand has also resulted in the

establishment of some 400,000 public Wi-fi access points (ITU, 2015) as well as its ongoing 70,000 Smart Net Village Hub. This was made possible by its tangible strategies of Partnership and Integration among all stakeholders and community real demands to leveraging the network of all community learning centers to be the real and sustainable smart coworking space: the community new learning space.

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Chapter 33
The Effectiveness and Impact of Social Media Approach on Students' Learning Performances

Seng Yue Wong and Wee Jing Tee

Abstract Learning approaches that utilize social media and social networking can promote pedagogical innovation by encouraging teaching and learning processes which are based on personalization and collaboration. The aim of this study is to uncover the impact of social media approach in terms of students' learning performance in a foundation course, ascertain which social media that students prefer and what satisfaction of student from social media. Hence, a descriptive study is selected for this study and 53 students have participated in this study. Results suggest that social media significantly impact on students' learning performance. The value of this study may contribute alternative learning pathway for effective blended learning in higher education institutions.

Keywords Social media · Social networking · Learning performance

33.1 Introduction

In this new twenty-first century, technology-based learning becomes the trend and theme of learning nowadays. Recently, intensive and extensive demands of transforming a print-based learning environment to a digital-based learning environment continued massiveness of education in general and focusing the need for global competitiveness in a post-industrial, knowledge-based economy (Jensen, Taylor, & Fisher, 2010). Hence, some study reports also showed the broad range of utilization of information and communication technology (ICT), such as communication, social networking and surveillance in our daily life. Computer-based devices are became a critical part of contemporary life, and the knowledge of them is the key to education and employment (Jensen et al., 2010).

S.Y. Wong (✉) · W.J. Tee
Taylor's University, Subang Jaya, Malaysia
e-mail: SengYue.Wong@taylors.edu.my

W.J. Tee
e-mail: WeeJing.Tee@taylors.edu.my

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In the last ten years, the online world or Internet has changed the world culture dramatically. Social media is an invention that offers youngsters exchange ideas, feeling, personal information, knowledge, news, pictures and videos at a surprisingly impressive rate (Laing, 2013; Owusu-Acheaw &Larson, 2015).

People can create content, share it, bookmark it via social media, due to the ease of use, speed accessibility. Surprisingly, social media has changed the public discourse in society and creating the new trend in topics, ranging from the environment and politics to technology and the entertainment industry.

Facebook, Blogs, Twitter, Myspace and LinkedIn are the examples of social media that are used for the aim of communication, sharing photographs and videos. Social media has become a way to communicate between people, without the boundaries of places (Laing, 2013). In other words, social media is a form of electronic communication which facilitates interactively based on relative interest, including web and mobile technology (Ndaku, 2013). Social networking also means the use of Internet to deliver or send information to other people, especially people who share the interest with to send messages to them (Ndaku, 2013).

The rapid growth of social media has a great impact on the way of people to communicate each other on a daily basis. Besides campus, students also can make connection with others or among friends outside of the school, such as restaurant, café and even in a transport, car, bus or light train. Since the social media have been increased its usage, the academic performance of students are facing a lot of challenges and neglect (Ndaku, 2013). A number of educators questioning the grades of the students will be affected by the time students spent on these social networking sites and social media (Owusu-Acheaw & Larson, 2015). In addition, they believe that the utilization of technology has a great impact in educational performance either positively or in contrast. Thus, this study is to answer that how social media affect the academic performance of the students from the students' perceptions in a selected higher education institution (HEI).

The objective of this study is to uncover the impact of social media approach in terms of students' learning performance in foundation courses, ascertain which social media that students prefer and what satisfaction of student from social media. This paper will present some literature reviews on the trends of using social media. Next, the findings and discussion of the study will be presented. The study findings will help to explore more information on the impact of social media on the students' learning performance, and it helps to understand the students' preferences of social media.

33.2 Literature Review

With the widespread use of Internet and the availability of smartphones, teenagers or youngsters nowadays go online constantly, and it becomes a part of their daily life. Generation *Y* are known as the new generation who always armed with new technologies and gadgets, where they are grown up with the exploration of digital

environment and rely on information technology (Sharifah, Nurul, Rozarina, & Intan, 2016). A report stated that 92% of teenagers (aged 13–17 years old) go to online daily and 52% of them go online several times per day from the study of Pew Research Center (Lenhart, 2015).

According to Lenhart (2015) report, Facebook remains the top used social media among American teenagers who are aged from 13 to 17 with 71% of them using Facebook, even as half of them use Instagram and 41% use Snapchat in the year 2015. Figure 33.1 shows the graph bar to indicate the top social media platform that is used by the teenagers in percentage. The majority of teenagers, 71%, are reported to use more than one social network site out of the seven platform options in the survey. Instead of Facebook, teenagers also used Google+, Instagram, Snapchat, Twitter and so on.

The research regarding the effect of spending time with internet is still on a formative stage (Ndaku, 2013). This study also claimed that studies have been conducted to prove that Internet and social networking integration have been contradictory. Most of the teenagers and students use social media to interact with their peers, share information and update latest status and news (Sharifah et al., 2016). Nevertheless, some studies also revealed that teenagers spent less time to talk to their family members felt more loneliness and depression and fewer friendship (Ndaku, 2013). Heavy Internet users also seemed to be more socially isolated than others. In contrast, Pew Research Center reported that people are not as isolated as has been reported previously (Hampton, Sessions, Eun, & Lee, 2009).

The emergence of social network platforms has impacted the way students engage with technology. Social networking and their educational uses attract attention from many researchers (Mehmood & Taswir, 2013; Ndaku, 2013; Owusu-Acheaw & Larson, 2015; Sharifah et al., 2016). Social networks are increasingly obtaining momentum in the world of ICT. Social media enables people to communicate with people that they know, find new people to communicate with, find people that lost touch with, find or set up a group via social media and keep in touch with what is going on (Laing, 2013). Setting up a group can promote to collaborative learning. With the advantages of social networking site, openness is a

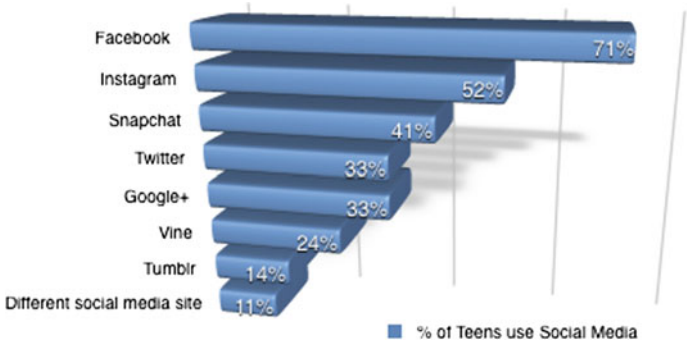

Fig. 33.1 Top social media platforms used by teens in 2015 (Lenhart, 2015)

vital element to provide open learning opportunities to the worldwide students. In this scenario, social media can work as open source technology which enables open online learning among students.

33.3 Methodology

Taylor's University offers courses that are ranged from foundation and diploma to degree, postgraduate and professional courses in multiple fields, such as medicine, pharmacy, engineering, business, biosciences, law, architecture, education, quantity surveying, communication, computing and information technology. Thus, it is estimated that the population of Taylor's University are approximately 4000 students. The School of Computing and Information Technology (SOCIT) is estimated having 400 students in population. As mentioned above, foundation course students are selected to be the respondents for this study. Fifty-three students from the foundation course are participated in this study. The sample proportion of the population with the population size, 400, is equal to 0.1325 (above the margin error 0.05 = 5%). Hence, the number of the respondents for this study is sufficient and acceptable (Chua, 2012).

Descriptive study, a non-experimental design, is selected for this study and is used to collect various types of data and descriptions from the different perspectives to examine the impact of social media on students' learning performance in Taylor's University. Data was collected via a questionnaire which was modified from the previous studies (Ndaku, 2013; Owusu-Acheaw & Larson, 2015). Thirteen questions are asked in the questionnaire, which are regarding to the usage of Internet and perceptions on social media and its impact on learning performance.

33.4 Results and Findings

The purpose of this study is to determine the impact of social media approach on students' learning performance, a descriptive study at SOCIT, Taylor's University. The analysis of the data is presented after collected via questionnaire that distributed to the respondents. This study answers the following research questions:

(1) What social media do the students have access to?
(2) How often do the students go online?
(3) How many hours do the students spend on social networking sites?
(4) How has the use of social media affected the students' learning performance?

From the demographic data of the respondents, there are 53 respondents as the sample for this study: forty-four (83%) of them are male, and nine (17%) of them are female. They are aged in the range from 16 to 24 years old, who are categorized

in Generation *Y*. All of them (100%) do access to the Internet, and 94.3% of them are aware of social media. From the seven social media options in the questionnaire, Facebook (98.1%) and YouTube (96.2%) are the top two famous among the students (refer to Table 33.1). They have been explored to different types of social media and know quite numbers of social media besides the seven options (Facebook, Twitter, LinkedIn, Google+, YouTube, Yahoo Messenger and WhatsApp) given in the questionnaire. Of the seven options, only 54.7% of the students know about LinkedIn. Instagram and Snapchat are another two options of social media known by students, which achieve at 28.3% (Instagram) and 11.3% (Snapchat), respectively. Skype, Reddit and WeChat also are well known among the foundation students. Table 33.1 shows the social media be aware or know about by the foundation students in percentage. All of them have an account with the social media that list in Table 33.1.

Figure 33.2 illustrates the students' favourite social media. Surprisingly, WhatsApp represents 90.6%, became the most favourite social media by the students. Facebook and YouTube are the second favourite social media by the students, which are representing 83% for both. LinkedIn represents 7.5% and Yahoo Messenger has 11.3%, respectively. This analysis has shown that WhatsApp, Facebook and YouTube are the top three social media sites that preferred by the foundation students.

Subsequently, the reason, which made students prefer to use social media, is given in Table 33.2. Most of the students prefer to use social media because of the speedy, which represents 62.3%. Next, 41.5% of the students prefer social media because they are cheaper and reliable whereas 30.2% of the students prefer social media due to the good reception. The other reasons given by the respondents are ease of use, convenient, fun and its stylish features or newsfeed. On the other hand, some of the students also do not prefer to use social media because of the addictive nature, which having 26.4% of them.

Table 33.1 Social media be aware by the foundation students in percentage

Social media	Frequency	Percentage (%)
Facebook	52	98.1
Twitter	45	84.9
LinkedIn	29	54.7
Google+	43	81.1
YouTube	51	96.2
Yahoo Messenger	32	60.4
WhatsApp	50	94.3
Others (Instagram)	15	28.3
Others (Snapchat)	6	11.3
Others (Skype)	1	1.9
Others (WeChat)	4	7.5
Others (Reddit)	1	1.9

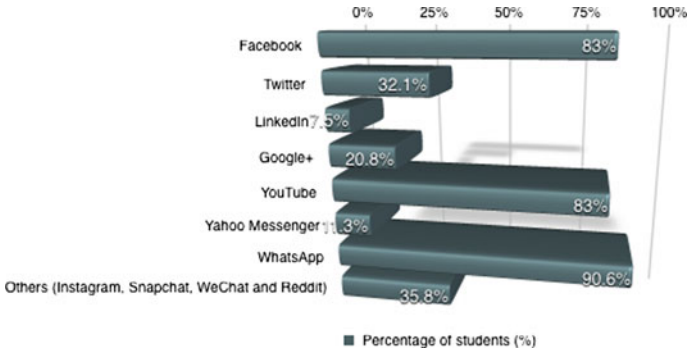

Fig. 33.2 Preference social media by the foundation students

Table 33.2 Reasons why students prefer social media

Reasons	Frequency	Percentage (%)
It is faster	33	62.3
It is cheaper and reliable	22	41.5
It opens multiple pages at the same time	7	13.2
It has good reception	16	30.2
Others	7	13.2

Table 33.3 Frequency of the students go online

Response	Frequency	Percentage (%)
Very often	37	69.8
Often	13	24.5
Not very often	2	3.8
Not often	1	1.9

The frequency of the students who go online is shown in Table 33.3. Obviously, majority of the students go online very often, which achieving 69.8%. A total of 24.5% of the students also go online often, which is equal to 13 of 53 students in total. Of 53 students, 42 students (79.2%) spend 6 h online per day and 13.2% of the students spend 4 h online per day. None of them spend 1 h online per day. The results totally showed that the foundation students have the features of Generation *Y*, who spend a lot of time to online, go online very frequent, ubiquitously. Another

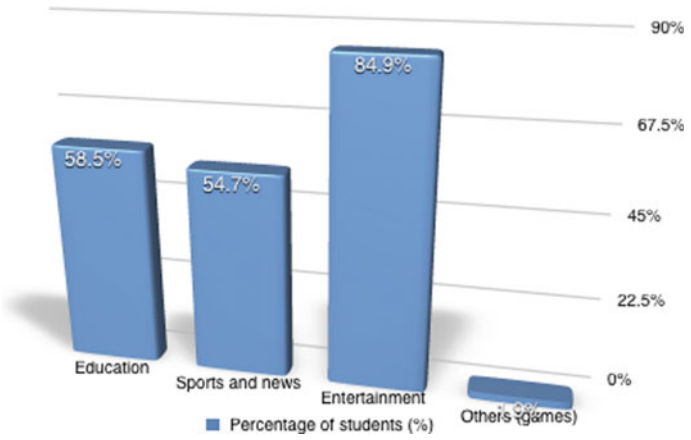

Fig. 33.3 Percentage of students for the purposes why they browse for

question is about the places that are used by the students for browsing Internet. Most of them (96.2%) use online at home. Sixty-six percentage of the students use online at school, and 47.2% of the students browse Internet at café. This also confirms that students go online without the boundaries of time and places.

If study further, the purpose of the student browse Internet has been investigated. Figure 33.3 represents the graph bar to show what students browse for. A total of 84.9% of the students browse Internet for entertainment, 58.5% of the students for education and 54.7% for sports and news, respectively. Besides that, this study also investigates what is the satisfaction do the students derive from browse Internet. It is same as the results in Fig. 33.3. Majority of the students (79.2%) are satisfied for entertainment. There are 66% of the students satisfied for information, whereas 47.2% of the students satisfied for chatting.

Although most of the students use online for entertainment purposes, education also achieves at a higher percentage, and 79.2% of the students believe that social media can affect their learning performance. Thus, this result also confirms that the use of social media has affected and influenced students' learning performance (Owusu-Acheaw & Larson, 2015). From the perspective of students, 60.4% of the students have positive views on the use of social media influenced on their learning performance. However, 30.2% of the students have no response on the use of social media influence on their learning performance. Only four students show negative responses for the use of social media affected their learning performance. This percentage is shown in Fig. 33.4. Hence, this can conclude that the use of social media has a positive impact on their academic performance.

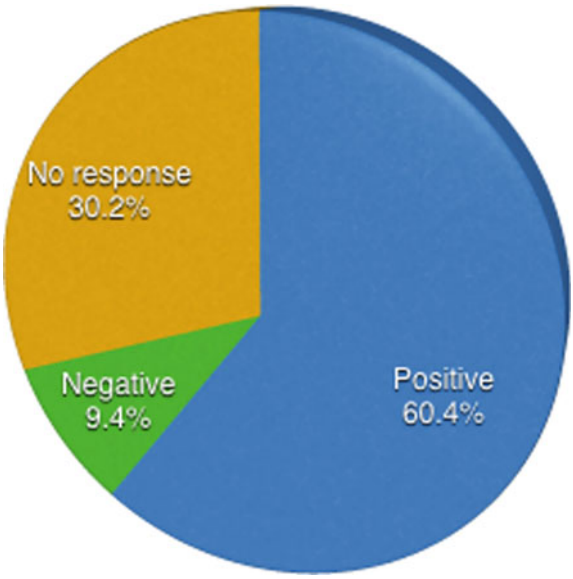

Fig. 33.4 Responses of students on how the use of social media influences their learning performance

33.5 Conclusion

The researchers tried to investigate the impact of using social media approach on students' learning performance among the students who study foundation in computing. The foundation course students are Generation *Y*, who use Internet very often and could not seem to live a single day without technology (Sharifah et al., 2016). The findings have uncovered that all foundation course students are aware of the social media, have an account with social media and have accessed to various social media sites; a great number of foundation course students are very often going online on various social media sites; the foundation course students have spent a lot of time to browse Internet; majority of them browse Internet for entertainment and they are satisfied for entertainment that derived from browsing Internet; 79.2% of the students believe that social media can affect their learning performance, and 60.4% of the students has shown positive response on the use of social media influence on their learning performance. This study only conducted a descriptive study on how social media impacts on students' academic performance from the students' perceptions. Due to the time and sampling limitation, a further study is suggested by using experimental study with a large amount of respondents to provide more significant findings and empirical analysis to show the positive impacts of social media on students' academic performances. Although some of the study has shown social media has negative impact on academic performance and attitude (Ndaku, 2013; Owusu-Acheaw & Larson, 2015; Sharifah et al., 2016), however, the beneficial features of social media, sharing knowledge and communicating others can promote collaborative learning and thus support the findings that

the use of social media have positive influence on students' learning performance. The value of this study may contribute alternative learning pathway for effective blended learning in higher education institutions.

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Chapter 34
Formative Assessment via Group Video Assignment for Business School Students in Tertiary Education System

Seng Yue Wong, Wou Onn Choo, Wen Yeen Chue and Ching Chieh Kiu

Abstract Technology is part of our daily life. With the introduction of tablets and smartphones around the world since 2008, the acceptance level is much higher than we thought. Today, it is slowly replacing the use of personal computer with more powerful hardware and richer apps features being introduced for tablets and smartphones everyday. The effects have somehow changing the way of teaching and learning in tertiary education system as well. The use of learning management system is a must for every college/university, and some of the formative and summative assessments are driven by technology such as group video assignment. The objectives of the paper are to identify the factors to be considered before setting the group video assignment, to identify the challenges of the students, and to propose the solutions for creating the group video assignment. The study is based on the focus group for both lecturers and students from business school in tertiary education system in Malaysia. The main contributions of the paper are to obtain the important factors and challenges from both lecturers and students and subsequently introducing the propose solutions for beginners and experts as a reference point for creating the group video assignment. The findings show that the creating of group video assignment is fun and challenging for the students as they need to construct the idea and solution into a 10-min video while the lecturers able to enrich the knowledge of discipline areas and creative problem-solving and scientific skills of the students more holistically.

S.Y. Wong (✉) · C.C. Kiu
Taylor's University, Subang Jaya, Malaysia
e-mail: SengYue.Wong@taylors.edu.my

C.C. Kiu
e-mail: ChingChieh.Kiu@taylors.edu.my

W.O. Choo · W.Y. Chue
UCSI University, Kuala Lumpur, Malaysia
e-mail: choowo@ucsiuniversity.edu.my

W.Y. Chue
e-mail: chuewy@ucsiuniversity.edu.my

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Keywords Video assignment · Summative assessment · Marking rubrics · Tertiary education

34.1 Introduction

In this advanced technology era, mobile technology gives a great opportunity to strengthen the quality of our life, including education field in many ways. The rapid progression of information communication technology (ICT) and embedded learning technology has affecting the way to teach and learn in school, including tertiary education. Many social media, social networking sites, and tools have been used as teaching tools to improve the learning quality and achieve educational goals. Thus, the technology has created opportunities for interaction, situated learning, and support for learning outside formal context (Aksel & Gurman-Kahraman, 2014). Video project assignment that prepared by learners has contributed to the emergence of new literacy practices.

Online learning is one of the fastest growing trends in education. There are estimated many students will undertake the online course or technology-based distance education with the emergence of mobile devices. The earlier studies of distance learning also reviewed that video conferencing and educational television were not significantly different from the conventional classroom learning in terms of effectiveness (Means, Toyama, Murphy, Bakia, & Jones, 2010). However, many researchers have contributed to the development of the research—computer-supported collaborative learning (Inaba & Mizoguchi, 2004). As mentioned previously, group video project can be used as one of the practices in summative assessment for the teaching and learning process currently. Students are engaged in their assignment to prepare their video while they are learning the new knowledge.

Video projects provide a social context where the learners able to interact and collaborate with others and experiment with a wide range of digital video technologies to create their personal meaningful multimodal artifacts (Aksel & Gurman-Kahraman, 2014). There are many benefits of using video assignment as current students' learning tool with the current technologies and the advantages of Internet and online services. The video project enables teachers and learners to create more dynamic and interactive classroom learning by fostering learners' autonomy and accountability.

Hence, the aim of this study is to identify the factors to be considered before setting the group video assignment, to identify the challenges of the students, and to propose the solutions for creating the group video assignment. The implementation of group video project among business school students is to engage students in these group projects in which they can search for the great opportunities to improve their learning skills, learn collaboratively, reflect their own learning as well as mixing the technology with their learning in business matters. This paper will present introduction on the benefits of video project assignment in students' learning. Next, literature reviews on video assignment and video assignment setting

will be presented. The interview results and findings from the students' and teachers' perceptions will be analyzed and discussed. Lastly, recommendations on group video assignment marking rubrics and video editing software are presented.

34.2 Literature Review

Group assignment generally can be found virtually in any learning environment. Group video assignment is one of the group assignments where the students are assigned to cooperate with each other on a joint assignment as a team and goals can be achieved by a solution to a problem, an idea of a product, or a plan for a solution via collective cognitive exercise into a video format. Nevertheless, group projects are often created without thought given to factors that provide for successful group effort. The teams need to work together to develop a basis of work together, which is difficult to see in the classroom (Adwan, 2016).

On the other hand, video assignment has increased its popularity since video providers, such as YouTube, Netflix, and Hulu, and video contents are requested an unprecedented level. Video assignment has its own benefits and distinctive characteristics (Yue, Yang, Chen, Guan, & Zhang, 2014). Firstly, people can access to the same video due to its contents can be reused. Secondly, lots of resources have to be allocated for video traffic due to the file size always large especially high density (HD) become popular recently. Thirdly, mobile users expected the video can be played smoothly, without too much buffering time. Lastly, different video has its different popularity. Thus, how these characteristic increased its popularity among students and be a part of learning task and used as assessment tool for them.

In this scenario, there are some benefits to use video assignment in the teaching and learning that are extract from the related previous studies (Harrison, 2003):

- **To illustrate conditions:** It is vital that learners become familiar with the principles and concepts of their study. All these can be made much more memorable if they are illustrated by video clips. Videos are always available and can be used in lectures, and these will save time too.
- **To show complex sequences of events:** Animated diagrammatic representations of complex events can be used and produced. The complicated business events that are shown in video can be illustrated via video assignment.
- **To show marketing skills:** Teaching in marketing skills is discussed, and the correct procedure for basic skills can be shown on video before the students attempt the procedures for themselves.
- **To stimulate student discussion:** A good designed and structured video can act as a starting point for initiating student discussion for important issues in business practice. A cross-cultural collaboration between students can trigger discussion to increase their thinking and problem-solving skills and address business problems.

- **As a tool for affective skills:** Students need to prepare themselves with knowledge, skills, and attitude after they completed their course. Of these, attitude is commonly challenged lecturers, which is hard to innumerate and explain to the students. To address this, video assignment enables students to put their technical skills into the context of appropriate professional behavior with respect to attitude. Students may ask to identify the correct attitude when they are doing their business meeting or marketing their products.
- **To provide students with feedback on their performance:** The video assignment which is created by the students afterward will be reviewed by the teacher for assessment. The strengths and weaknesses can be identified with view to improving students' skills. For example, the interview between customers or clients and student can be replayed and can discuss particular aspects to learn their communication skills. Lecturer and student feedback can be viewed to evaluate their performance.

Furthermore, a successful video assignment needs to gather evidence for learning outcomes. Students should gain meaningful practices and think critically by expressing themselves in the video assignment instead of know how to create or develop video (Baepler & Reynolds, 2014). Eventually, students feel more confident in their technological abilities, increase their ability in video composing, and feel engaged by the video assignment.

34.3 Methodology

The use of technology in the teaching and learning is a must to enrich and enhance the understanding and creating new knowledge from the existing one. In order to create a video group assignment, it involves several major aspects such as subject matter (topic, sub-topics, area, learning outcomes), person involvement (both lecturers and students), and technology use. The authors have decided to use the qualitative method and focus group to conduct the research via information and feedback from the interview. There are 10 open-ended questions used in the focus group interview.

The target of this survey is mainly on lecturers and students who are involved in the video group assignment process. The reason is to understand better from the primary resources pertaining to their usage and experience throughout the entire process from creating the assignment to the submission and marking of the video assignment. The focus group size for a study varies, ranging between 3 and 14 respondents, which is based on the study field (Ary, Jacobs, Sorensen, & Walker, 2014). For this study, there are 4 lecturers and 8 students involved in the focus group interview. All the lecturers and students have at least one-time experience in creating the video group assignment and one-time experience in preparing and completed the video group assignment, respectively.

After the focus group interview sessions with lecturers and students as stated above, the summary from the interview will be analyzed and summary based on few keys elements such as factors to be considered while using the technological tools for setting video assignment and the challenges of the students while answering the assignment.

34.4 Findings and Recommendations

34.4.1 Findings: Focus Group Interview

As per the earlier discussion, the focus group interview will be based on 2 groups: (1) lecturers and (2) students. The findings will be discussed as follows:

1. Focus Group Interview: Lecturers

The interview sessions with the lecturers are focusing on 2 parts, and the outcomes of the interview will be summarized in this section.

(a) Factors to be considered when creating the video assignment

Findings from the interview with the lecturers pertaining to the factors to be considered when planning and creating the video assignment as follows:

- **Selection of topic areas to be used in video assignment**: There are many topics being covered in the module. The lecturers found out that it is not easy to select a particular topic to be used for video assignment creation. The reason given is focusing on the worry of students not able to construct the ideas and describe the information by presenting in a single video.
- **Mapping with the module learning outcomes**: Every single assignment given must be in line with the module learning outcomes. The traditional written assignment is easier to be mapped with the module learning outcomes as each written assignment can be broken into few sections which may easily presenting the components which map according to the learning outcomes. Due to the nature of video assignment which is constructed into one component, the learning outcome can be achieved, but it is not clearly divided into each section.
- **Student's video creation literacy**: The students in the class are with different computer literacy generally and video creation literacy specifically. Majority of the students are without the knowledge of creating the video assignment. Hence, it is a challenge for students to produce the video assignment. The major worries are not able to submit the assignment on time and not able to produce the video that can fulfill the module learning outcomes.

(b) Challenges of video assignment

- **Acceptance of video assignment**: Students are used to the conventional written assignment; hence, it is a challenge to request the students to produce a good

video assignment which can fulfill the module learning outcomes fully. The students tend to be very worry when they know the assignment is given in the video mode. Several discussions in the class and during consultation hours of guidance will be able to make the students understand better the requirements of the assignment.

- **Contributions among group members**: Traditional written assignment can be broken into several sections and can distribute the works among the group members easily and equally. The situation for producing a video assignment is different. The distribution of works for video assignment is depending on the individual roles on planning, gathering information, finding suitable graphics, video, text and animation, capturing the video, compilation, and editing the video. The tasks need to be discussed and distributed between members as some of them are not so good in computer skills.
- **Software usage coaching and assistance**: There are many video editing software available via Internet. All the software is equipped with the basis features of editing and producing a video, but some with extra features may require some fees. Because the student numbers in the module exceeded 100, the software couching and guidance to the students are limited. Students are required to learn and explore the software by themselves, and the lecturers will only focus on coaching the students how the video content should be in line with the requirement of the assignment.
- **Awarding of marks for the assignment**: The marks of video assignment given were between 30 and 50%. It is clearly known that it is a major component of the module, and all of the assignments are in group assignment format. Due to the nature of video assignment which is not separated into component, the marks awarded in each assignment might be very different among groups in the module. The lecturers tend to watching the video as a whole and awarding the marks in the marking scheme given.

2. Focus Group Interview: Students

The interview sessions with the students are focusing on 2 parts, and the outcomes of the interview will be summarized in this section.

(a) Challenges of video assignment

- **Constructing and planning the ideas**: Students found it very difficult to plan and coordinate the creation of the video from few aspects such as they are not familiar with the software, not able to compile the idea from words into video element, not able to express the content via the video mode and distributing the works among the group members compare to the written assignment.
- **Familiarity of video creation software**: Majority of the students are not familiar with the video editing software. They found it difficult to learn, edit, and produce the video. They are more familiar with the preparation of PowerPoint presentation which may be later converted into video file.

- **Completion of video creation between the time frame**: Video planning, editing, and creation are very time consuming. It is not as easy as searching the information over the Internet, analyze, compile, and summarize the information in required format. The time spending on searching for the suitable information, graphics, sound, text and animations, planning the flow of the video, and capturing and editing video is tremendous. In order to finalize the complete video (between 8 and 10 min), the video needs to be played and edited in order to smoothen the animation and transition of the video.

(b) Reflective thinking from the video assignment

- **Fun but challenging**: Students found that it is very fun in capturing and editing the video. They seem to acting like the film producer to produce a video which can be traded as a commercial advertisement or small movie. The challenging part lies in the use of the video editing software and also to complete the assignment between the specific time frame.
- **Preferable of written assignment**: Majority of the students mentioned that they still preferred the written assignment rather than video assignment as they able to construct and produce the report according to the format given, and usually they are able to get a high mark for the assignment. Also, students are not required to learn new software in order to complete the assignment which is very time consuming.
- **Amaze with the advancement of video creation technology**: The students used the photoshooting and editing apps in the mobile phone but not the video editing software. Students are new to the video editing software and are amazed with the easy-to-use and easy-to-learn features such as drag and drop and visual tools which are easily being used and navigated.

34.4.2 Recommendations

In this section, some recommendations for beginners and experts will be introduced to serve as a purpose of reference points.

1. Marking Rubrics

Some important elements to be considered when creating the marking rubrics are stated as follows:

- **Time frame**: The time frame given to complete the assignment should be minimum of 6 weeks and up to maximum of 8 weeks.
- **Total marks awarded**: The marks awarded in the assignment should be between 25 and 50% as the marking rubrics is covering many components.

- **Mapping with module learning outcomes**: Lecturer should take note of the video assignment topic given should be able to cover the module learning outcomes.
- **Multimedia elements**: The multimedia elements and effects should only be awarded with a maximum of 20% of the total marks of the assignment.
- **Focus points of the video**: The major components of the video should be focusing on the content and delivery of the message. The marks awarded should be with a minimum of 60% of the total marks of the assignment.

2. Video Editing Software

The summary of some of the popular and easy-to-use video editing software available over Internet is depicted in Table 34.1.

Table 34.1 Summary of video editing software with the features

Online video	Feature
PowToon	• Uses animation to capture your audience's attention • A library of tutorial videos to help get new users up and running • Video can export directly to YouTube • A user can create 45 s of free video
Kizao	• A user need to more time to get used to working with the tool • Provide video templates • Can edit images, create collages, apply filters, add effects, and others
Animato	• Can add pictures, text, and video clips • Easily post and track videos on the web, social media, and email, or download to DVD
WeVideo	• A user can use either storyboard mode (novice users) or a timeline mode (advanced) to pull their clips, images, and sounds together • The editor includes a variety of higher end features such as white labeling, animation, and color keying (like a green screen) all from within an Internet browser • Collaborative environment that enables several people in a group to work on a project at any given time • The WeVideo Google drive lets a user save all his projects, complete or incomplete directly to his Google drive account • Its Android app also allows a user to capture raw footage directly from the user phone
Biteable	• It provides hundreds of animated live action or photograph scenes in lots of different styles, or just use a stylish and pre-made template • Easily add text, photos, colors, and sound to customize a video and edit it all on a simple drag-and-drop timeline • Easily to share a video on YouTube, Twitter, or Facebook just by pressing a button
Stupeflix	• Unlimited free videos • Each video is limited to 20 min • Add photos, video, text, music, theme, maps, transitions

(continued)

Table 34.1 (continued)

Online video	Feature
	• Set movie pace, individual durations, and volumes • Trim video, reverse, or slow motion
Flixpress	• Using personally uploaded audio on multi-layout templates • Music or audio recording need to be saved on a user computer as an mp3 file before the user can use it in your video
Moovly	• Make videos or make presentations using library objects and free templates • Can add images, sounds, and video clips • Can share videos with team members, download them for offline use, or publish them to YouTube, Facebook, or the free Moovly Gallery

34.5 Conclusion

As a summary, both the lecturers and students have interest on video assignment. The focus is not on the video as a medium but the construction of content which require the constructive, cognitive and teamwork in order to produce a good video.

The findings from the interview that outline some factors to be considered when creating the video assignment such as selection of top cares to be used in video assignment, mapping with the module learning outcomes and student's video creation literacy; some challenges of video assignment from the lecturer's perspective such as acceptance of video assignment, contributions among group members, software usage coaching and assistance and awarding of marks for the assignment. Some challenges of video assignment from the student's perspective are constructing and planning the ideas, familiarity of video creation software, and completion of video creation between the time frames; some of the reflective thinking from the video assignment from the student's perception is fun but challenging, preferable of written assignment and amazed with the advancement of video creation technology.

Some recommendations for setting up the marking rubrics such as time frame setting, total marks awarded, mapping with the module learning outcomes, multimedia elements and focus points of the video; together with the recommendation of some video editing software serve as a reference points for both beginners and experts.

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Chapter 35
Education as a Political Tool for Empowering Students and the Community

R. Ratneswary V. Rasiah

Abstract It is becoming increasingly evident that there is a need to continuously innovate teaching and learning practices to effectively educate, develop and empower students, in the ever-changing landscape of higher education. A large and growing body of literature highlights the need for institutions of higher education to develop innovative teaching and learning practices to effectively meet the academic and social needs of a diverse set of students, and prepare them to take their productive place as leaders in the global community. While extensive literature has focused on first-year learning experience, the literature is scarce on the final-year students' learning experience, which is equally important as they need to be empowered for a successful transition into the workplace, increasing their adaptability to the rapid changes in the global community, preparing them for a knowledge-based society. This study fills the gap in the literature by investigating the impact of innovative teaching and learning practices on the learning experience of final-year business students taking a course on International Economics Theory and Policy.

Keywords Innovative teaching and learning practices · Students' learning experience · Graduate capabilities

35.1 Introduction

35.1.1 Innovative Teaching and Learning Practices

Innovation is a term that seems to be loosely used by many, especially in the face of numerous recurring problems. It is often used to present a solution to the various trials and tribulations that society faces in today's world. As Winslett (2014) aptly points out that the term innovation "*appears in federal policy, in role titles, in departmental names and in mission statements*". What exactly does innovation

R. Ratneswary V. Rasiah (✉)
Subang Jaya, Malaysia

S.F. Tang and S.E. Cheah (eds.), *Redesigning Learning for Greater Social Impact*, DOI 10.1007/978-981-10-4223-2_35

mean? This is a grey area, as far as higher education is concerned. While there are so many loosely termed definitions, the idea of innovation generally resides on the transformative process that either a product, service, organization, or individual goes through to enhance well-being.

With the enormous challenges and crises faced by communities in the twenty-first century, it is little wonder why higher education policy makers have pushed forward the innovation agenda. This is in line with the Malaysian Education Blue Print (2015–2025) that seeks to promote continued excellence in the higher education system in Malaysia by increasing the use of innovative learning and teaching practices, with the aim of developing students' competencies so that they eventually become holistic, entrepreneurial and balanced graduates (Malaysia Education Blue Print, 2015). A large and growing body of literature (Christensen & Eyring, 2011; Rasiah, 2014; Soares, 2012; Yong-qin, 2002) highlights the need for institutions of higher education to develop innovative teaching and learning practices to effectively meet the academic and social needs of a diverse set of students, and prepare them to face the challenges of the twenty-first century.

Over the last two decades, the focus has been on first-year learning experience. There is scarce literature on the final-year or students' learning experience, which is as important, as the graduating cohort need to be empowered for a successful transition into the workplace, increasing their adaptability to the rapid changes in the global community, preparing them for a knowledge-based society. This study fills the gap in the literature by investigating the impact of innovative teaching and learning practices on the learning experiences of final-year business students taking a course on International Economics Theory and Policy. The use of Google docs, in particular Google Slides, a Web 2.0 technology tool, as the main innovative tool, paved the way for a higher level of collaboration, teamwork, communication and empowerment. Students were also exposed to other innovative forms of learning, and these included Padlet, Socrative, YouTube educational videos and the use of group discussions and presentations which were all conducted in the X-Space collaborative classrooms. Web 2.0 teaching tools have been found to positively transform learning and teaching in higher education. It is of utmost importance that educators reflect and critically plan their lessons and the pedagogical tools they aim to use, if their intention is to maximize students' effective learning. Planning a lesson is by no means an easy task, as it entails thinking critically about the learning outcomes that the students must attain, not only in terms of knowledge, but also in enhancing or developing their skills. The educators play a huge role in effectively educating, developing and empowering their students, employing innovative teaching and learning practices to enable effective learning to take place, in this ever-changing and highly fluid landscape of twenty-first-century higher education.

35.1.2 Problem Statement

The landscape of the twenty-first-century job market is filled with uncertainty about the types of jobs that will be available in the next ten years, let alone for the rest of the twenty-first century. With the advent of technology, many traditional people-based jobs are now taken over by robots and machines, making the human worker redundant. How then, does one teach the students of today to ensure they are capable of doing the jobs of the future? How can higher education institutions provide meaningful lifelong experiences that will ensure that their graduates survive the uncertain job markets of the future? How can we ensure that our graduates are empowered to be the change agents who will transform communities? What do we need to do in class to empower our students to "take over" the instruments of societal power and influence, to transform their communities? As it stands, higher education institutions have been transformed "from a system designed to educate an elite, to one of mass education that aims to educate the whole of the youth of our countries" (Esteve, 2000). Mass higher education brings with it many challenges and confounding problems not only to the educators, but also to the job market. Graduate employability is a key performance indicator for a majority of universities, and if educators do not transform their pedagogy to suit the needs of the future job markets, they are then doing gross injustice to their students. There is therefore, a need to continuously innovate teaching and learning practices to develop and empower students, for a successful transition into the workplace, increasing their adaptability to the rapid changes in the global community and preparing them for a knowledge-based society. Students must "*increasingly participate in the assessment of their work, through constructive dialogue with other students and their teachers" to make learning and teaching a more integrated activity, thereby creating collaborative learning environments* (Ashwin, 2006).

35.2 Literature Review

With the advent of the Internet era, there has been a proliferation of new and sophisticated technologies that have brought about some very promising prospects to educators of higher education. While some may see it as promising, others are convinced that it imposes many new challenges that they never faced before. The students of today grew up with technology and are so depended on their computers, mobile devices and the Internet for learning, communicating and leisure activities. As a result, traditional methods of teaching and learning have had to undergo transformations beyond recognition in some cases, where innovative technologies and practices are being utilized, and students are exposed to learning anytime, anywhere. As Slavich and Zimbardo (2012, p. 569) noted "Transformational teaching involves creating dynamic relationships between teachers, students, and a shared body of knowledge to promote student learning and personal growth. From

this perspective, instructors are intellectual coaches who create teams of students who collaborate with each other and with their teacher to master bodies of information". ***In most cases, the students are far more tech-savvy compared to the faculty, hence encouraging collaborative student-faculty, student-peer and student-community learning. To understand how powerful these innovative technologies and practices can be to an educator, and to the students, this study explores the impact of innovative teaching and learning practices on the learning experience of final-year business students. Although there have been an increase in the number of studies done on innovative teaching and learning technologies, Meyer (2010) highlights the lack of empirical studies into the impact of Web 2.0 tools in higher education. This study is therefore in the right direction as it addresses the lack of existing literature on the educational benefits of innovative technologies.***

This study is based on the social cognitive theory (Bandura, 1986) and the theory of constructivism, which argues that learning is an active process that is unique to every individual and requires students to mentally construct their own knowledge. Learning strongly correlates to experience and does not matter how or where learning takes place, as noted by Bransford, Brown, and Cocking (2000). Using innovative teaching and learning technologies such as Google Slides, Padlet and Socrative in the X-Space classrooms involves social constructivism, as students collaborate and construct knowledge based on their prior experience and building on their previous and current knowledge. Active learner-centred environments are therefore created, to enhance students' overall learning experience. When a student learns well, he or she becomes empowered to bring the much needed change to his or her community, making education a political tool of sorts. Vygotsky (1978) aptly argues that learning is a social activity that involves a trilemma of connection between communication, collaborative activities and interactions with others, and this learning trilemma has been proven to enhance cognitive and critical thinking skills.

35.2.1 Pedagogical Strategy

This study focused on the learning experience of final-year undergraduates of the March 2016 semester who undertook the International Economics Theory and Policy module. Prior to the semester, a lot of thought was put into making the module more engaging by introducing several innovative practices and assessments that were hoped to enhance the students' learning experience. It was decided that all tutorials would be conducted in the X-Space collaborative classrooms, as these classrooms provided a collaborative learning environment that allowed the use of interactive classroom technologies and conducive learning environment to promote collaboration and student engagement that enhanced the quality of learning. However, it must be stated that the X-Space classroom by itself cannot enhance learning, without the important role played by the academics, who are required to

reflect and critically plan their lessons and the pedagogical tools and technologies they intend to use way in advance, for effective learning to take place in the X-Space classrooms. A thoroughly planned lesson requires investment of time and energy, as it entails thinking critically about the learning activities, curriculum, innovative teaching and learning techniques to be employed, and the learning outcomes that the students must attain, not just in terms of knowledge, but also in terms of enhancing or developing their skills.

In order to effectively use the X-Space classroom, it was imperative that a variety of innovative teaching and learning tools were utilized by the academic. After much reflection, one of the innovative tools chosen was the Google Slides, which was used in every tutorial class. Google Slides was used as it is a Web 2.0 technological tool that promotes collaboration and communication. The Google Slides was created for each tutorial group with different preset tutorial questions for different weeks. The Google Slides was named after the tutorial groups and tutorial week and was opened only to students from the respective tutorial groups who were given permission to edit the slides during the tutorial. Since the X-Space classrooms had five tables with six students each, the tutor would assign tutorial questions to each group during the tutorial lesson, giving the groups enough time to collaborate, discuss and present their findings to the class. Students found the collaboration to be beneficial in terms of the academic discourse that took place and the social connections they fostered with their fellow course mates.

The students were required to research and discuss each week's tutorial questions and provide meaningful solutions to the questions. They would then be required to present their answers. Since Google Slides is an interactive learning tool, all answers could be seen by others, thereby truly supporting collaborative learning. Students were encouraged to take their tasks seriously as their solutions would be shared with their fellow course mates in the same tutorial group. Once the groups presented, the academic would provide feedback and if there were errors or amendments to be made, the groups would then amend their answers accordingly. The opportunity to share ideas and knowledge and to post up articles, video links, charts and figures through Google Slides was seen as an effective means of learning, as the students began taking responsibility for their own learning in a student-centred learning environment. The academic facilitated the discussions and spent time providing the much needed feedback after each group had presented. The use of Google Slides was perceived to be beneficial, as it was a real-time platform that provided a non-threatening, collaborative environment for effective learning to take place.

Aside from the Google Slides (as the main technological tool), the academic also brought in YouTube education videos (how to download secondary data from the World Bank website, how to use EViews to run data analysis and how to interpret and analyse statistical results, among others) to enhance the self-directed learning capabilities of the students in completing their individual assignment, which required them to write a term paper (in the form of a journal article) on issues related to international economics. Some of these students' term papers have been sent for publication in academic journals, as these papers are of a good quality.

The students were also exposed to other innovative teaching and learning tools such as the Web 2.0 education tools comprising of Padlet and Socrative, to further enhance their learning experience. Padlet was used to allow students to upload their EViews results once they had learned to use the software in a self-directed manner by watching the selected YouTube educational videos and following the steps. The students who could not follow the YouTube videos were provided face-to-face consultations on using EViews. This allowed diverse sets of students to learn meaningfully. Most students were able to learn in a self-directed manner, indicating how empowered they were in their own learning. Socrative, on the other hand, was a perfect online, real-time platform to conduct short quizzes after tutorial lessons, to reinforce learning.

Aside from an individual assignment, the students were also exposed to a group assignment that required them to review a book related to international economics issues. Most students decided to use e-books in this book review assignment, showing their competencies in the virtual realm, much to the delight of the lecturer.

35.3 Research Methodology

This study employs the mixed-method research methodology, where both qualitative and quantitative data analysis techniques are utilized. The mixed-method strategy is relevant as it allows the researcher to gain a rich understanding of the context of the research and the processes being enacted, allowing triangulation to take place to ensure the reliability of the findings.

The data analysed in this study were collected from the online Teaching Engagement Scale (TES) survey completed by approximately 60 students from a total of 68 students who took the International Economics Theory and Policy module. The TES is a system that collates teaching and learning feedback from 4 key stakeholders (students, peer, self and superior) via a set of validated online questionnaires, to generate evaluations of the overall teaching experience a lecturer provides. For this study, the teaching engagement feedback was provided by the students, while the feedback on impact of the module impact on the students' learning experience were provided by the 4 stakeholders (students, peer, self and superior), with the highest weight coming from the students. We not only examined the survey results, but also analysed the qualitative feedback provided by the students, who reflected on their overall learning experience of undertaking this module. The students' qualitative feedback captured the students' perceptions of the effectiveness of the innovative teaching and learning practices, in enhancing their learning experience and competences. The study employed the qualitative techniques of content analysis or textual analysis to analyse the qualitative feedback given by the students. Kimberly Neuendorf (p. 10, 2002) defines content analysis as follows:

> Content analysis is a summarising, quantitative analysis of messages that relies on the scientific method (including attention to objectivity, intersubjectivity, a priori design, reliability, validity, generalisability, replicability, and hypothesis testing) and is not limited as to the types of variables that may be measured or the context in which the messages are created or presented (Neuendorf, p. 10, 2002).

The content analysis technique was able to make inferences by objectively and systematically identifying emerging constructs and specific characteristics of the learning experiences that these students expressed in their qualitative feedback.

To complement the qualitative feedback, the students also filled in the online questionnaire that was able to elicit further information of their perceptions on the effectiveness of the innovative teaching and learning tools and practices utilized by the academic in the X-Space collaborative classroom, on their learning experience and acquisition of various competencies or skills. This survey was carried out to complement the findings of the content analysis. The TES survey instrument was a purposefully designed and validated structured questionnaire, "*primarily developed to provide lecturers and schools with reliable information with which to make informed decisions about continuous professional development and improving student learning outcomes*" (TES, 2016), where the 4 stakeholders are required to evaluate the module and the lecturer's teaching engagement. The responses are captured on a 5-point Likert scale with an option for a qualitative response by the students.

35.4 Discussions of Findings

This study is a two-pronged study that employs a mixed-method approach (both quantitative and qualitative) to examine students' learning experience. We will first examine the quantitative aspect of the survey results based on the students' perception of the overall teaching experience a lecturer provides, and the four stakeholders' perceptions of the seven dimensions of the teaching engagement assessment scale of students' overall learning experience. The questionnaire for the students contains several items measuring two different constructs. The first section contains a set of 14 items focusing on the teaching engagement construct, using a 5-point Likert scale, which is answered by the students. The second section contains a set of 6 items assessing the module effectiveness and this section is only answered by the students. As for the other stakeholders (self, peer and superior), they are required to answer the same 14 items that focuses on the teaching engagement construct, which is then clustered into 7 dimensions of the teaching engagement assessment. The results of the survey taken by the students are shown in Figs. 35.1 and 35.2, while the triangulated results taken from all 4 stakeholders are shown in their 7 dimensions in Fig. 35.3.

Figure 35.1 provides clear evidence that the students appreciated the innovative teaching and learning techniques employed by the academic in conducting the lessons. The highest mean score (4.8) was for the item "T1: My lecturer related the

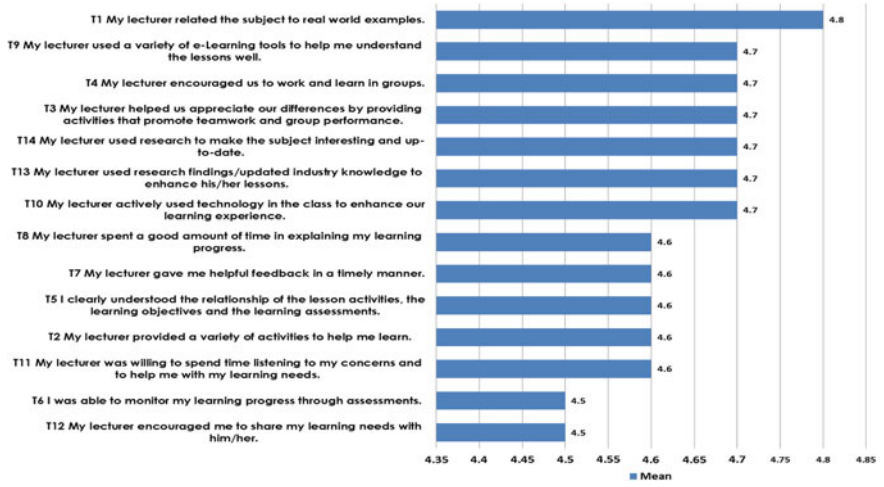

Fig. 35.1 Teaching Engagement Scale Mean Scores (Likert scale of 1–5)

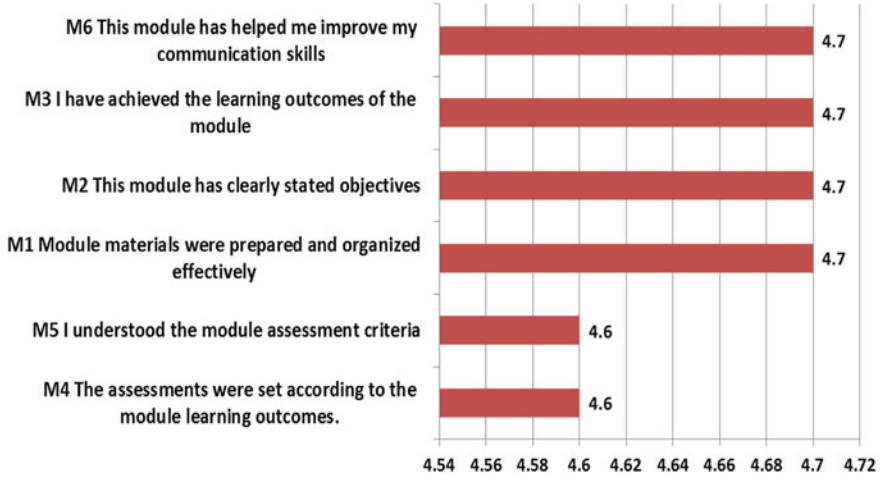

Fig. 35.2 Module Questions' Mean Scores (students' feedback)

subject to real-world examples" revealing how important it is for the academics to continuously update themselves on the real-world issues and connect the curriculum to the real world. This reveals how students are motivated to learn a particular subject matter which is connected to the real world of business, concurring with the findings of Ehiyazaryan and Barraclough (2009) and Tompkins and Schlesinger (2010).

The evidence shown in Fig. 35.1 also demonstrates the students' perception (mean score of 4.7) of how effective innovative teaching and learning techniques

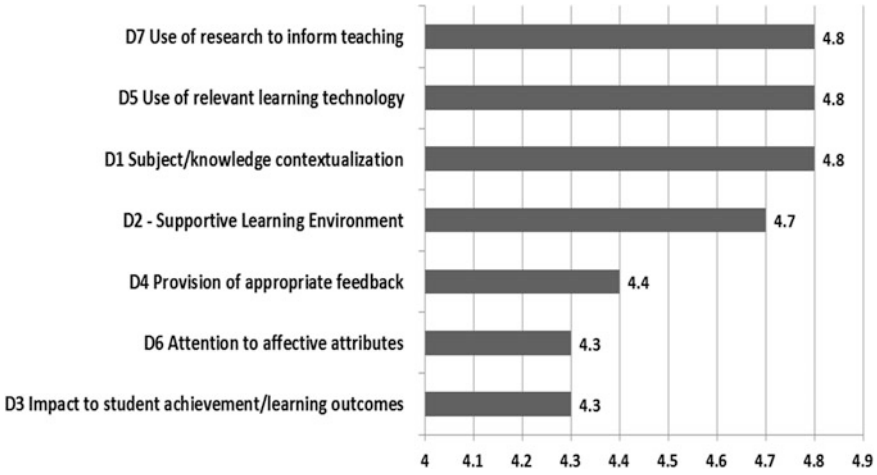

Fig. 35.3 TEA Dimensions' Mean Scores (feedback by the four stakeholders)

are to enhance their learning experience. These innovative practices include the use of e-Learning tools and the active use of technology to help students understand the lessons well; the use of learning activities (Google Slides, discussions) that promote teamwork and group performance; the use of research to make the subject interesting and up-to-date; the use of research findings or updated industry knowledge to enhance the lessons; and the active use of technology in the class to enhance the students' learning experience. Wu, Tennyson, and Hsia (2010) and Lin, Chung, Yeh, and Chen (2016) concurred with our findings that e-learning and the use of technology enhanced students' learning experience.

The results also revealed that students were motivated with the use of research to make the subject interesting and up-to-date (mean score of 4.7), agreeing with the findings of Jenkins, Healey and Zetter (2007) and Jiang, Fuming, Roberts, and Pamela (2011). It was also found that the students perceived the module to be effectively prepared and organized, with clearly stated objectives. The students also perceived that they had achieved the learning outcomes of the module and enhanced their communication skills, as demonstrated in Fig. 35.2. The module contents and how it is delivered can motivate the students to learn; their enhanced learning experience will empower them to take charge of their lives and transform their communities.

Figure 35.3 shows evidence that stakeholders perceived the most important teaching engagement assessment dimensions were the use of research to inform teaching, use of relevant technology and subject/knowledge contextualization (all with mean scores of 4.8). This was followed by the second most important dimension, which is the supportive learning environment provided. Once again, the evidence strongly points to the use of innovative teaching and learning practices (research-informed teaching, use of relevant technology and contextualizing knowledge) to enhance students' learning experience.

The second part of this study utilizes content analysis to analyse the qualitative feedback provided by the students. This broad-based, thematic analysis found a pattern of commonalities which were coded into seven emerging constructs. The six constructs represented the students' most identifiable or most frequent feedback, comprising of positive learning experience, lecturer's characteristics/capabilities, real-world curriculum connections/subject/knowledge contextualization, classroom management and skills/competencies/graduate capabilities. Content analysis was used to categorize the students' qualitative feedback into the six emerging constructs as shown in Table 1.1.

35.4.1 Construct I—Positive Learning Experience

Based on the evidence in Table 1.1, the most important construct that emerged from the content analysis of the students' qualitative feedback was the positive learning experience, which reveals how innovative teaching and learning methods such as the use of Google Slides to promote collaborative learning, disrupt classes and provide the necessary tools to inspire students and enhance their learning experience. The findings concur with a wide selection of well-documented literature on the role of technological innovations in teaching and learning to support meaningful educational experiences (Christensen, Horn, & Johnson, 2008; Irwin, Ball, Desbrow, & Leveritt, 2012; Koh, Herring, & Hew, 2010; Rasiah, 2014; Stephen, 2014; and Srinivasan, 2014). Christensen, Horn, and Johnson (2008) advocated the creative use "of information technology to deliver customized education tailored to the needs of different students". The following excerpts were written by two different students, capturing the essence of the overall learning experience they enjoyed:

"*Dr ratnes gave me a **fantastic wholesome learning experience** here in taylors this semester **i feel blessed** to be under her tutelage for 2 consecutive semesters. her **passion in teaching truly leaves an impact which lasts beyond the classroom***" (Student 15).

"*I believe that **more students from ibm should take this course** as i think it **provides students with an awesome opportunity to learn about the world** around them. the **module is compact and concise**, which is good for those who want to learn economics*" (Student 22).

"*Ms ratnes has always been **among my best lecturer** in taylors and **she inspires us to study more and more** …*" (Student 27).

"***Very efficient and entertaining in learning** in the class, **make me feel energize** especially on Friday*" (Student 28).

The feedback given augurs well with Brown's (2008) notion of engaging students in an innovative, active and collaborative manner, which makes students' responsible for their own learning and allows them to shape their learning experience.

35.4.2 Construct II—Lecturer's Characteristics/Capability

The overall feedback was succinctly captured in the following excerpts of Student 11 and Student 12, respectively:

"*The way she conducted the class was just* ***so amazing and unique*** *as compared to the other lecturers, she* ***makes us think and discuss****, and* ***share with us*** *international economics issue in every tutorial class*" (Student 11).

"***Best lecturer*** *ever she is* ***charismatic and extremely knowledgeable*** *about what she teaches, and is* ***willing to impart additional knowledge beyond that of the classroom*** *and* ***relate real life****, current economic examples to further clarity understanding*" (Student 12).

"*An incredibly* ***awesome lecturer****, always* ***sharing positive vibes*** *and* ***taking care of everyone****. definitely* ***one of the best lecturer*** *one could get in taylors university and* ***may more students learn and be inspired by*** *dr ratnes*" (Student 20).

"*Overall, dr. ratnes is a* ***all rounder lecturer*** *with* ***high knowledge*** *and* ***a lot of fun in class****. its* ***never boring*** *with her lectures or tutorials*" (Student 16).

"***Every tutorial questions was clearly explained in proper way***, ***every day was interesting learning*** *from dr ratnes*" (Student 19).

"*Dr Ratneswary is someone who is* ***wellversed with the world economy*** *and with regards to this module, international economics theory and policy****, it is essential to have the knowledge***" (Student 23).

"*Ms ratnes is a really* ***great tutor****, she* ***always has time for us and answers all our questions*** *and* ***teaches us until shes sure we understand the course material****. thank you so much, ms ratnes if given a choice, i would vote her lecturer of the year*" (Student 33).

"*Lecturer has a* ***good sense of humor****, and she* ***pay attention to academically weak students*** *and* ***teaches them with patience****.* ***never to forget to treat other students fairly too***" (Student 38).

The feedback on the role of the lecturer's characteristics/capabilities is endorsed by the literature on learning (Daniels, 2010; Harden & Crosby, 2000; Kaendler, Wiedmann, Rummel, & Spada, 2015; Opdenakker & Van Damme, 2006). In implementing innovative technologies and practices in the X-Space collaborative learning settings, the lecture is perceived to have played a crucial role in fostering student interaction and enhancing their learning experience. Carl Gustav Jung (1875–1961; p. 144) hit the nail on the head when he reflected that "*One looks back with appreciation to the brilliant teachers, but with gratitude to those who touched our human feelings. The curriculum is so much necessary raw material, but warmth is the vital element for the growing plant and for the soul of the child*".

35.4.3 Construct III—Real-World Curriculum Connections/Subject or Knowledge Contextualization

The importance of connecting curriculum to real-world issues and the lecturer's ability to contextualize knowledge received several encouraging feedback from the students:

"*This module* ***provides me clear insights about the economics*** *which related with the real world examples. clear explanation is provided*" (Student 1).

"*Perfect i have experienced many funny and interesting lecture and tutorial for this module. the* ***lecturer answer my question clearly with real world example***, ***really useful*** *to me*" (Student 3).

"*This module is particularly interesting where it develop the students to understand how countries communicates the* ***lecturer gave us a lot of real world example of the theories*** *throughout the learning progress to understand the subject*" (Student 24).

"*A lecturer that is patient, understanding, funny, kind and full of knowledge.* ***always relates what is learnt in economics to real life situations occuring throughout the world that makes economics much more easier to understand and not boring***" (Student 25).

The lecturer's ability to contextualize knowledge or subject matter by identifying and applying various manifestations of the concepts and theories to real-world issues is clearly of value to the students as revealed by their feedback. Curriculum connections to real-world issues and the ability to contextualize knowledge draw on the social cognitive theory and the theory of constructivism, in which students learn better by reflecting about their academic concepts and theories and applying them in real-world settings, in a constructivist learning environment. This concurs with the findings of (Forrester-Jones & Hatzidimitriadou, 2006; Brundiers, Wiek, & Redman, 2010).

35.4.4 Construct IV—Classroom Management

In order to maximize learning, students learn best in a non-threatening and comfortable learning environment. The academic is ultimately responsible, for ensuring a conducive learning environment is created, by effectively managing the classroom to ensure students do not feel isolated or lack a sense of belonging.

"I learned a lot through dr.Ratneswary class, and the ***class is very interactive****, makes* ***every student in the class have a good relationship and help each other*** *when in needs"* (Student 7).

Our findings share the sentiments of others (Hattie, 2002; Mansor, Wong, Rasul, Mohd Hamzah, & Hamid, 2012) that effective classroom management resulting from the implementation of innovative teaching and learning practices has an impact in enhancing a positive learning experience among students.

35.4.5 Construct V—Skills/Competencies/Graduate Capabilities

In terms of skills/competences, the students perceived that the innovative manner, in which the lessons were conducted, enhanced their teamwork, critical thinking and communication skills as illustrated in some of their qualitative feedback:

"This lecturer has provided me a good insight of the subject. she ***uses xspace very well*** *which made me realize the importance of the classroom.* ***Working in groups*** *has* ***helped me in brainstorming*** *and* ***improving my communication skill****"* (Student 2).

"I learned a lot through dr.Ratneswary class, and the class is very interactive, makes ***every student in the class have a good relationship and help each other*** *when in needs"* (Student 7).

The way she conducted the class was just so amazing and unique as compared to the other lecturers, she ***makes us think and discuss****, and share with us international economics issue in every tutorial class* (Student 11).

The findings of this study reveal that innovative teaching and learning practices, when effectively implemented, will endow students with new or more enhanced skills/competences, consistent with the findings by Garrison and Anderson (2003); Lin and Jou (2012); and Ventura and Quero (2013).

35.5 Conclusions and Implications

Based on all the qualitative feedback given by students, and the quantitative results in Figs. 35.1, 35.2, and 35.3, it is evident that the students had an effective learning experience, which motivated them to be active learners, collaborating with the materials, the lecturer and their fellow peers. The students were appreciative of the innovative teaching and learning technologies and practices utilized in their classes; the real-world connections to the curriculum; the lecturer's knowledge, skills and pleasant disposition that created a positive, non-threatening, well-managed and collaborative environment which encouraged learning; and the various student-centred activities that encouraged teamwork and enhanced their critical thinking and problem-solving skills. Active learning can only be effective if the students take responsibility in their own intellectual and personal development by reading, writing, taking part in discussions and engaging in higher-order cognitive competencies such as problem-solving, critical thinking and analysis, synthesis and evaluation (Smith et al., 2009; Svinivki & McKeachie, 2011).

The results of this study pave the way for institutions of higher learning to take the necessary steps to develop the innovative capabilities of their faculty members to transform and innovate their teaching and learning practices to cate for the needs of their current tech-savvy students. In an effort to provide students with a more holistic learning experience, institutions of higher learning must continue allocating

resources for student-centred learning mechanisms and innovative technologies and practices. Education is, after all, a political tool that empowers students, increasing their capability and adaptability to face rapid changes, preparing them as change agents who will go on to become our future leaders and "take over" the instruments of societal power and influence, to uplift the community at large.

It would be beneficial to undertake future research that will focus on the impact of innovative practices and technologies on student attrition and retention, and what is it about innovative practices that make it relevant at different points in the students' academic journey, and in ensuring students' successful progression and graduation.

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Chapter 36
The Impact of Experiential Learning Programme Towards Graduates' Career Capabilities

Lee Kim Lian

Abstract The purpose of this paper was to examine an experiential learning technique (industry immersion module—IIM) and its impact on graduates' career capabilities. In IIM, a team of four students would work with a sponsoring client on a business project. It promotes high level of engagement, learning and development and provides students with an extended opportunity to apply academic and theoretical perspectives to a "real-world" setting. As more graduates flood the employment market, there is an ever-growing pressure on higher education industry to better prepare graduates for employment. Literatures indicate that experiential learning can positively affect student's absorption and understanding of knowledge. In order to find out the effectiveness of experiential learning, feedback survey designed to measure graduate career capabilities as well as to gather employers' responses/comments was carried out. Graduates reported that experiential learning via IIM enhanced their preparation for careers and helped them in transitioning from the role of being an undergraduate to an employee. In a practical sense, graduates are better prepared for employment. Hence, this will be an added advantage to fresh graduates in confronting the challenging market. In addition, feedbacks from industrial employers are being shared with the students for self-improvement and development.

Keywords Experiential learning · Higher education · Immersion project

36.1 Introduction

Experiential learning is a term used to describe the process of learning from experience. Experiential learning theory was first introduced in twentieth century. Since then, researchers had coined various terms to label it. Dewey (1938) first calls

L.K. Lian (✉)
Subang Jaya, Malaysia

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the learning from experience as "learning by doing", while Wolfe and Byrne (1975) define it as "experienced-based learning". Other researchers such as Hoover (1974) suggested the key point of experiential learning involves more than just the cognitive learning capability that basically emphasized by management education. As such, Hooever and Whitehead (1975) propose the following definition of experiential learning as "Experiential learning exists when a personally responsible participant cognitively, affectively and behaviourally processes knowledge, skills and/or attitudes in a learning situation characterized by a high level of active involvement". From the early research on experiential learning, we found that experiential learning had been adopted as a learning pedagogy that closely links to academic knowledge and practical skills.

Ever since then, more efforts have been made to improve the learning process from what has been called "the new science of learning" (Bransford, Brown, & Cocking, 2000). Research in experiential learning and other kinds of "active" pedagogies are gaining greater influence in higher education, in the form of out-of-classroom instruction, service learning projects and first-year student programmes through experience-based courses (Densmore, 2000; Gaumer, Cotleur, & Arnone, 2014; Kahne, Westheimer, & Rogers, 2000; Sommers, 1997; Varlotta, 1996).

There is a move towards greater experiential learning on education highlighted experiential education as a best practice in higher education spanning multiple disciplines and contexts including technology (Ames, 2006; Chilton, 2012; Gaumer, Cotleur, & Arnone, 2014), business (Devasagayam, Johns-Mastern, & McCollum, 2012), social work (Thompson, Bender, Cardoso, & Flynn, 2011) and recreation (Andrew, Fleming, Ferkins, Wierma, & Coll, 2010; Robinson, Barron, & Solnet, 2008).

Experiential learning technique (ELT) provides a complete model for the learning process. It is called ELT because there is an emphasis on experience which plays an important and crucial part to the learning process which distinguishes itself from other learning techniques such as cognitive learning. Cognitive learning emphasizes on cognition over affect. ELT is based on the term "experiential". Conley (2008) argued that experiential learning is the process of discovering, processing, applying information and reflection while others such as Ruhaneu (2005), Hawkins and Weiss (2004) have suggested experiential education as a method of linking "academic knowledge and practical skills" and "it stresses practical application of knowledge to real-world situations".

36.2 Research Question

This study looks at immersion as a form or methodology in experiential learning and how it contributes to the experiential learning as a whole. Thus, the following research question is put forwards.

"How the industry immersion project can maximize student learning experience and make them job ready by providing them with a real-business environment and experience in real time?"

36.3 Literature Review

Experiential learning is broadly defined as "the process by which a learner creates meaning from direct experience" (Bohn & Schmidt, 2008, p. 5). Experiential learning includes a variety of strategies that engross students in learning opportunities that go beyond traditional lectures and reading and writing assignments (Shapiro & Levine, 1999) and when implemented in a classroom setting, students participate in real-life activities, reflect on those activities and incorporate their new understanding of that activity into their lives (Bohn & Schmidt, 2008).

Experiential learning theory offers a dynamic theory based on a learning cycle driven by the resolution of the dual dialectics of action or reflection and experience or abstraction. It is defined as a holistic learning space wherein learning transactions take place. It is a useful framework to design and implement management education programmes in higher education, management and training and development (Kolb & Kolb, 2011). Experiential learning is a method used in transformational teaching that involves creating dynamic relationships between teachers, students and a shared body of knowledge to promote student learning and personal growth (Slavich & Zimbardo, 2012).

Review from literatures indicated that experiential learning has gained popularity in higher education in the form of outside classroom activities, service learning projects and students' final-year projects through experience-based courses. Many educators employed the use of experiential education as a teaching pedagogy. Experiential learning can have significant benefits to educators and students in their capacity of teaching and learning. For example, study by Benander (2009) reported how experiential learning is not just for students but can be a valuable tool to reflect on teaching and learning. The implication of experiential learning as a form of critical reflection for the scholarship of teaching and learning is that it adds another mode of inquiry. As for students, experiential learning has significantly benefited undergraduate students especially in key areas such as (i) personal, (ii) interpersonal, (iii) civic and (iv) professional development (Aldas et al., 2010; Simons et al., 2012; Sweitzer & King, 2009).

Hence, there is a rapid adoption of experiential learning strategies in university education with the idea that such constructivist method to teaching and learning practice will further improve students' learning in various approaches. Either called it "constructivist" or "experiential", these pedagogies depend on its fundamental strategy of learning through interconnected cycles of experience, reflection, experimentation and evaluation (Dorsey, 2001). The utility of constructivist learning in assisting students to connect conceptual and applied learning has been noted by numerous researchers (Kolb, 1984; Sommers, 1997; Walcott, 1999).

While some other researchers have identified the potential for certain kinds of experiential learning to promote social justice by fostering students' critical reflection upon their conceptual and applied learning about social, political and economic inequity (Cone & Harris, 1996; Densmore, 2000; Flint, 2002).

Kolb, Kolb, and Sharma (2014), studied on educator role profile, indicate that to some extent educators do tend to teach the way they learn. Findings indicated those with concrete learning styles are more learner-centred and preferred the facilitator role while those with abstract learning styles are more subject-centred and preferred the expert and evaluator roles. The researchers suggested a model for the practice of dynamic matching of educator roles, learner style and subject matter that can aid in the planning and implementation of educational experiences. With practice, both learners and educators can develop the flexibility to use all educator roles and learning styles to create a more powerful and effective process of experiential learning.

Clements and Cord (2012) explore an innovative experiential learning programme built on the principles of work-related learning that develops students to attain graduate qualities for competitiveness in the business sector. If such programmes continue to focus assessment and design around student learning, students will not only have the opportunity to apply their knowledge in a practical context, they will also be maximizing their personal learning outcomes with the added advantage of being better equipped to compete in an increasingly competitive marketplace.

Many educators have initiated to employ the use of experiential education as a teaching methodology because the technique stimulates a deeper approach to learning. Students are encouraged to make connections between theory and practice through lecture, discussion, learning activities, practical experience and reflection (Bethell & Morgam, 2011; Bower, 2013; Judge et al., 2011). Study by Bower (2014) reported experiential learning in relation to physical education and sport pedagogy emphasizes the value of experiential learning in the planning, organizing, leading and implementing a road race. The study highlighted the achievement of the learning outcomes as the experience allowed students to develop a strong ownership in their learning due to their active role and learning in developing the experience. Students learned in a meaningful and productive way to obtain vital skills in managing an event.

Aldas et al. (2010), Sweitzer and King (2009) in their study conclude that students' experiential learning has enhanced their understanding of content knowledge, ability to contribute to the welfare of the community and capacity to achieve their career goals. In addition to that, experiential learning promotes higher communication skills. The reason being is that students are forced to communicate and engage with their instructor and peers. Also reported in a study conducted by Koponen, Pyörälä and Isotalus (2012) stated that students' positive attitudes to learning communication skills increased significantly and their negative attitudes decreased significantly between the beginning and end of the course.

Yardley, Teunissen and Dornan (2012) in their study emphasize the importance of experiential learning in curriculum development. They found the ideas (theories)

are relevant to educators ranging from those with responsibilities for curriculum design to "hands-on" teachers and workplace supervisors. The various experiential learning theories provide a conceptual grounding for promoting favourable learning conditions throughout the spectrum of medical education.

In the nutshell, these findings suggest that experiential learning is transformative in nature. Undergraduate students are put into a position that encourages them to use their discipline-related knowledge to practise and formulate new attitudes, knowledge and skills that lead to potential changes in their civic values, consistent with service learning research on personal, civic and professional development (Eyler & Giles, 1999).

Unlike more traditional teaching techniques such as lecturing or tutoring, experiential learning involves the students and the lecturer in actively shaping the learning process (Ramsey & Fitzgibbons, 2005). When teachers are beginning to adopt an experiential learning technique within the classroom, there needs to be a close relationship between lecturer and student and between the students themselves so as to create a learning environment that is conducive, open and honest. Most educators are used to being in charge in the classroom and represent the expert who knows anything and everything about that particular subject or field. This can be detrimental to the learning process because it creates an environment where the good ideas can only come from the educator as he or she is the expert and the less good or wrong ideas are those that are different. Emerson (1996) comments that it is important for educators to step back when implementing the experiential learning from their role as experts and adopt an attitude of humility. As such, the instructor's role is redefined that in the experiential classroom the relationship is seen more of as an alliance (Kisfalvi & Oliver, 2015), "fellow traveller" (Welker, 1991) or co-creators of teaching and learning (Ramsey & Fitzgibbons, 2005).

However, as noted by researchers the building of such an alliance between instructor and student can be difficult in teaching (Ramsey & Fitzgibbons, 2005). This stems from the fact that genuine conversations in the traditional classroom setting is extremely restricted or non-existent. It is important that the teacher creates a space for good conversations as part of the educational process to enhance the students experiential learning (Keeton, Sheckley & Grigges, 2002). Significant learning through conversation can happen between the teacher and student although it may not be the learning the teacher intended. Baker (2010) explains that when an environment promotes conversational learning, students can transform their collective experiences and differences into new knowledge through the sense they make together.

36.4 Industry Immersion Module (IIM)

The module is designed to equip students with essential management skills and competences. It provides a capstone experience to students in integrating and applying everything they have learned in the bachelor's programme in analysing, researching, planning and devising business plan for the company.

The module is based on experiential learning, i.e. learning by doing. The module comprises of two stages: (i) preparation stage and (ii) experience stage. The first stage consists of series of workshops that address specific skills including communication skills, interpersonal skills, problem analysis and problem-solving skills, critical thinking skills, project management and leadership skills. During the second stage (14 weeks), the students would work in teams (3–4 students) to understand the real-world, live business case. Client from the industry provides the project brief with relevant background along with the project assignment and criteria. Academic mentor and industry mentor are assigned to assist students during the experience stage.

The task is to develop and provide the following deliverables:

1. A comprehensive business plan for the sponsoring client.
2. Research insights, findings and other analysis in understanding the business issue/phenomenon.
3. Make a strategic and tactical recommendation and create an appropriate implementation plan.
4. A presentation to the sponsoring client, communicating in a convincing way the insights, strategies and recommended plan of action.

36.5 Methodology

Students who have completed and passed a minimum of 60 credits with minimum 2.67 CGPA are eligible to register for industry immersion module (IIM). The module was first introduced in 2014 and to date 2 batches of students have completed the module. For the August 2015 intake, thirty-three (33) students were selected and assigned to eight (8) companies. Table 36.1 below is the list of companies involved in the project:

In order to gauge the success of the module as well as students' learning experience, students were asked to fill up feedback survey questionnaire prior to completion of the module. The questionnaire design is as follows (Table 36.2):

Table 36.1 List of companies

1	Maybank
2	TEG
3	Price water coopers
4	Deloitte
5	Zuellig pharma
6	BDO (BizDO)
7	Shell
8	Schlumberger

Table 36.2 Questionnaire design

Section	Variables	Items
A	General information: student profile	5
B	Nature of the project	3
C	Support from industry supervisor	8
D	Working environment	5
E	Skills acquired	4
F	Learning experience	7
G	Support from industry supervisor	5
H	Overall evaluation and comments	Open-ended
4-point Likert scale 1 = Strongly agree to 4 = Strongly disagree		

36.6 Discussion and Conclusion

For the purpose of this study, the analysis and conclusion focused only on the following sections of the survey:

Section B: Nature of the project,
Section E: Skills Acquired,
Section F: Learning Experience.

In addition, for **Section H: students' overall evaluation and comment**s (open-ended), codes were assigned according to the themes from the survey (Table 36.3).

At least 70% of the students agreed that the project is appropriate and relevant to their studies. However, a few of these students indicated that the nature of the project is not suited to their field of study. They mentioned in their comments that they were not allowed to choose the company hence they were assigned to companies that are not related to their majors. A few of the accounting and finance

Table 36.3 Nature of the project

	Strongly agree 1		Agree 2		Disagree 3		Strongly disagree 4		Mean	Rank
	No.	%	No.	%	No.	%	No.	%		
The scope of the project is appropriate	10	**30.30**	15	**45.45**	7	21.21	1	3.03	1.97	1
The context of the project is relevant to my studies	8	**24.24**	17	**51.52**	5	15.15	3	9.09	2.09	2
The topic of the project is relevant to my studies	9	**27.27**	14	**42.42**	6	18.18	4	12.12	2.13	3

Table 36.4 Skills acquired

	Strongly agree 1		Agree 2		Disagree 3		Strongly disagree 4		Mean	Rank
	No.	%	No.	%	No.	%	No.	%		
I have developed first-hand experience of different aspects of the business operations	21	**63.63**	9	**27.27**	3	9.09	0	0	1.41	1
I have developed communication and collaborative skills through interpersonal interactions and group discussions	18	**54.55**	14	**42.42**	1	3.030	0	0	1.5	2
I have developed problem-solving and critical analysis abilities through examination and evaluation of the business issue	14	**42.42**	19	**57.58**	0	0	0	0	1.56	3
I have developed leadership skills through self-reflection and professional engagement	9	27.27	17	51.51	6	18.18	1	3.03	1.97	4

students voiced out that they were being placed in companies that are more suited for students majoring in marketing and management.

Result from Table 36.4 indicates that more than 90% of the students agreed that they have developed first-hand experience; communication and collaborative skills; and problem-solving and critical analysis abilities during their fourteen (14)-week group assignment with the companies. In addition, 79% of the students claimed that they have developed leadership skills through professional engagement.

This result strongly indicates that the experiential learning via the case study project has trained students with the necessary skills and competences to understand the real-world business issues/situations according to the case studies that were assigned to them. Students commented that working in a team from diverse academic background gives them the opportunity to learn from each other and share different ideas/views. They highlighted that working together in solving the "real" business case studies involves a lot of discussion, cooperation and communication. And since differences in opinions do exist among team members, they are required to think and evaluate the case studies critically and at the same time they have to fulfil the clients' requirement/demand. They also mentioned that they are able to

Table 36.5 Learning experience

	Strongly agree 1		Agree 2		Disagree 3		Strongly disagree 4		Mean	Rank
	No.	%	No.	%	No.	%	No.	%		
There were ample opportunities for learning	15	**45.45**	17	**51.51**	1	3.030	0	0	1.56	1
Would you recommend this IIM to other students?	17	**51.52**	13	**39.39**	3	9.090	0	0	1.59	2
The tasks assigned to me were challenging and stimulating	12	**36.36**	19	**57.58**	2	6.060	0	0	1.69	3
I feel that I am better prepared to enter the working world after this experience	14	**42.42**	15	**45.45**	3	9.090	1	3.03	1.72	4
This experience gave me a realistic preview of my future working career	14	**42.42**	14	**42.42**	3	9.090	2	6.06	1.78	5
I was given adequate training or explanation of the project	8	24.24	19	57.58	4	12.12	2	6.06	2	6
I have a better understanding of concepts, theories and skills in my course of study	10	30.30	10	30.30	10	30.30	3	9.09	2.16	7

observe and learn from the diverse leadership styles during meetings from different representatives of the respective companies.

Based on the result from Table 36.5, majority (more than 90%) agreed that the project provides them with the opportunity for learning and they would recommend the module (IIM) to their peers. Result also reveals that more than 80% of the students agreed that despite the challenges, they feel that they are better prepared to enter the working world as the experience gave them a realistic preview of the working environment.

The students commented that the experience is interesting and different from the traditional internship programme. The business case study project gave them the opportunity to be involved in a real work situation (industry exposure) and to familiarize themselves with a different culture. They claimed that they are able to understand and "bridge the gap" between university and working life. With the experience gained, they are able to appreciate the requirement of the industry.

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