UNIVERSITI TEKNOLOGI MARA

Institut Pendidikan Neo

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

VOLUME 7
JUNE 2017
ISSN 1985-8620

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

 ISSN 1985-8620

INTERNATIONAL JOURNAL ON E-LEARNING AND HIGHER EDUCATION

Vol. 7 June 2017 ISSN 1985-8620

The Relationship Between Learning Environment and Psychological Characteristics in Higher Education

Mohd Azry Abdul Malik[1], Mazlini Adnan[2], Norafefah Mohamad Sobri[3], Amri Abdul Rahman[4], Jasrul Nizam Ghazali[5]

[1,3,4,5]Faculty of Computer and Mathematical Sciences,
Universiti Teknologi MARA Kelantan,
Bukit Ilmu, Machang, Kelantan, Malaysia
azry056@kelantan.uitm.edu.my
[2]Faculty of Science and Mathematics,
Universiti Pendidikan Sultan Idris,
Tanjong Malim, Perak, Malaysia

Received Date: 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

This study investigated the relationships between quality of learning environment (physical and psychosocial environment) and psychological characteristics (student self-efficacy and satisfaction) in statistic education. The target population is a total of 380 students from diploma level, Faculty of Computer Science and Mathematics, University Teknologi MARA. By using cluster sampling, 285 students were selected as sample. The study instruments were adapted from Smart classroom inventory SCI, Science Laboratory Environment Inventory PSLEI, College and Classroom Environment Inventory CCEI, Learning and Performance subscale from the Motivated Strategies for Learning Questionnaire MSLQ for College students, Test Of Science-Related Attitudes TOSRA and Self-Efficacy in Learning and Performance for College. The gathered data was mainly analysed using Smart Partial Least Square (SEM-PLS). The findings revealed that physical and psychosocial learning environment have significant and positive relationships with student satisfaction. In addition, the study confirmed that learning environment influence self-efficacy positively. Finally, the study's theoretical and practical implications as well as the directions for future research were provided and discussed.

Keywords: *Learning environment, physical environment, psychosocial environment, psychological characteristics, self-efficacy, satisfaction.*

INTRODUCTION

The study of environment has been conducted in various fields such as psychology, architecture, sociology, education and others. However in the educational field, studies about learning environment have not been done enough according to Zandvliet and Fraser (2005). Improving the quality of learning environment have a huge potential to increase positive effect on student's characteristics and behaviour. The learning environment refers to the physical and psychosocial aspect, and some researches also include pedagogical aspect which affects teaching and learning process, student's achievement and attitudes. Learning environment functioned as a major role in improving teaching and learning process and was identified as one of the vital determinants of students learning's succession. Learning environment also capable of nourishing the students to engage in the learning process. Moreover, Kember, Ho and Hong (2010) and Okurut (2010) found that the quality of learning environment is also capable in motivate the student to learn. Fraser (1998) has considered that providing a proper learning environment is one of the possible remedies to improve learning outcomes. Student learning outcomes are also proved to be incremented via a comfortable and enjoyable teaching and learning environment (Hijazi & Naqvi 2006; Baek & Choi 2002; Lizzio, Wilson & Simon, 2002). Khine (2002) in his study identified the learning environment as a determinant of successful teaching andlearning process. In 2001, Chang and Fisher published a paper which they described a good quality of learning environment tend to increase students' achievement. Ten years earlier, McRobbie and Fraser (1993) already demonstrated that students' positive perceptions on quality of learning environment revealed a consistent relationship with student outcomes. It may be noted that most of the studies revealed that students seem to learn better in high quality of learning environment.

This study is different from other studies in three aspects. First, the study focuses diploma level of education. The situation in Malaysia, although numerous studies of education field have been conducted among students in primary, secondary schools, undergraduate and even in the level of postgraduate, study focusing on diploma level was inadequate. Secondly, this study attempts to assess both physical and psychosocial learning environment set up in teaching and learning process that can give a direct effect to psychological characteristics. Thirdly, this study involves

statistics education. If we were to look from education perspective, statistics courses or subjects, as compared to science and mathematics are lack of attention. This study focuses mainly on Regression analysis I subject because there are tremendous fundamental concepts of statistic in that particular subject such as the fundamental of correlation, parameter, the hypothesis testing, test statistic, error term and others. Once the students can master the knowledge and concept of regression analysis, it will be easier for them to learn other type of multivariate analysis because of the relatedness. Therefore, the present study aimed to investigate the relationship between learning environment and student's psychological characteristics in statistic education settings.

LITERATURE REVIEW

The discussion on learning environment construct begins with the concept of learning environment and learning environment models. For psychological characteristics, the discussion focus on the student's self-efficacy and satisfaction construct. The discussion begins with the concept of definition, the concept of the construct, and the importance of the construct.

The Concept of Learning Environment

Learning environment can be categorised into psychosocial learning environment and physical learning environment (Kilgour, 2006; Zandvliet & Straker, 2001; Fraser, 1998). Physical learning environment refers to both physical construct such as learning space, tidiness, cleanliness, lighting and classroom size. On the other hand, psychological construct covered safety aspect, good relationship, and autonomy in expressing ideas, feeling and thought (Wanekezi & Iruloh, 2012; Ambrose et al., 2010). Generally, physical component includes all physical aspects such as classrooms, teaching materials and learning facilities while psychosocial learning environment related to the type of interaction between students, teachers and social environment where teaching and learning process is took place. Both physical and psychosocial constructs should complement each other in creating and shaping the overall quality of learning environment. With a great quality of learning environment, the quality of learning process and outcomes will automatically improve either directly or indirectly.

The Theory Related to Learning Environment

There are numerous studies and models that highlighted the importance of learning environment in teaching and learning process. Among them are Lewin "Grand Truism", Walberg productivity model,model of conceptual systematic change and model representation schematics productivity education. In 1979, Moos suggested a model which describing the determinants of classroom climate. The model shows the significant relations occurred between the classroom characteristics and the psychosocial environment of the classroom. Based to the model, the components of the learning environment in the classroom not only give a significant effect to the classroom climate directly, but also affect it indirectly via the organizational factors, teacher attribute, and student characteristics. Specifically, both the organizational factors and the teacher characteristics affect the classroom climate directly and affect indirectly via the aggregate student characteristics. Dorman (2009) also mentioned that actions of educators took in teaching and learning process motivate, facilitate and encourage students to work more efficiently.

In earlier year, Lewin (1936) have studied the problems associated with the individual's motivation and motivation within the group. Based on his research, Lewin recommended a formula that explained about human behaviour that is B = f (P, E). In the formula, 'B' described as human behaviour which are formed as a result of an individual's personality functions (P) and environment (E). The formula has identified that the environment and interaction with personality is an important factor in determining human behaviour. The graphical relationship among the variables shown as Figure 1.

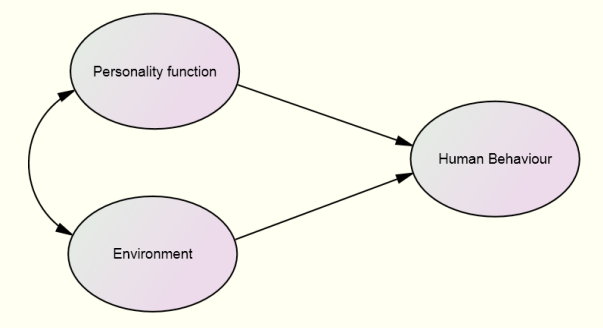


Figure 1: Relationship between Personality, Environment and Human Behaviour by Lewin (1936)

Study conducted by Walberg (1981) produced another learning environment model called productivity model. The model highlighted about the important of the learning environment. In the model, Walberg has identified nine elements that affect the education productivity and those elements are correlated to each other. According to Walberg, nine of the elements are bind together to form three important factors that influence the production of learning. The factors are talent (ability, motivation, and level of development), teaching methods (quantity of instructions and quality of teaching) and environments (home, classroom, peer groups and media). These factors are mutually inclusive and give a direct influence on the learning production in terms of shaping the student's affective, cognitive and behaviour. As suggested by Walberg, educators need to explore those nine elements to create effective learning. The summary of relationship between the variables involved in the productivity model is shown in Figure 2.

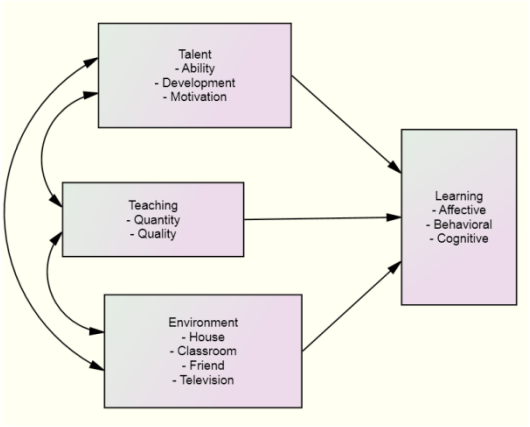


Figure 2: The Productivity Model by Walberg (1981)

A few years after the productivity model, Gardiner (1989) comes out with a learning environment model that described the relationship between the physical, psychosocial and technology learning environment. According to Gardiner, there are three overlapping circles known as ecosfera**,** sociosfera and tecnosfera. Ecosphere associated with the physical environment, sociosphere associated with the outcome of individual interactions with others in their environment, while tecnosphere described as a technology learning environment. Gardiner mentioned that students are the most complex component in the system whereas they will be influenced by all those three type of environments. In 1999, Zandvliet make a great attempted in the learning environment model development where he modified Gardiner Models, with the classroom physical environment as ecosphere, classroom psychosocial environment as sociosphere and implementation of new educational technologies represent tecnosphere component. The model shows the significant correlation existed between the physical environment, psychosocial environment and use of information technology. These variables also contributed to student development. The model suggested that by manipulating the environment, the productivity in education output can be improved. The model is as shown in Figure 3.

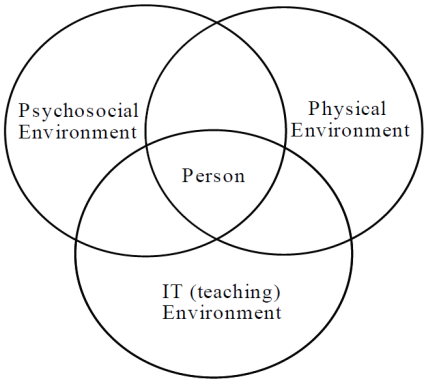


Figure 3: The Factors Influencing Student Satisfaction by Zandvliet (1999)

Altogether, various interesting models have highlighted the positive potential effects of learning environment toward development of a person. It can be summarized that, by increasing the quality of the learning environment seems to be able to increase the efficiency of teaching and learning process. Learning environment also is one of the important factors that should be given advance attention because of its ability to improve cognitive, affective and behaviour of an individual.

Psychological Characteristic

The psychological characteristic refers to the behavioural characteristic of how individual express their feelings that cause different thinking skills process and way they learn (Santrock, 2009; Woolfolk, 2004; Sternberg & Williams, 2001). This sub-section reviews the discussion on two major factors of psychological characteristic; student self-efficacy and satisfaction.

The Concept of Psychological Characteristic: Self-Efficacy

Self-efficacy is commonly defined as the individual belief in his/her own capabilities to acomplish a desired goal. In early year, self-efficacy is defined as a belief of individuals behavioral capability in achieving specific objectives (Bandura, 1986). In today century, the definition of self-efficacy exactly sharing the same meaning as before. According to Golightly (2007), self-efficacy could simply be defined as a person's confidence in their ability

to accomplish a task succesfully. The definition is consistent with McGrew (2010) in Model of Academic Competence & Motivation (MACM), where author interpret self-efficacy as reflection of a person self-assured in their potential to systemize, plan and maintain the performance in solving a problem or accomplishing a given task.

In education perspective, academic self-efficacy can be refers to a person's belief that they can successfully reach the designated level on an academic task or achieve a specific academic goal (Bandura, 1997). The similar definition given by Woolfolk (2004) where academic self-efficacy is defined as students' readiness, keenness, intention, and endavour to achieve learning objectives with eminent accomplishment. This type of psychological characteristic also refers to students' self-awareness proficiency in working and completing the goals (Stajkovic & Luthans, 2003). When student fail to complete their tasks, high self efficacy students will able to mantain their focus and put an extra effort to achieve the goal successfully. In simpler implication analogy, a person with a stronger self-efficacy means that a person likely to have more positive behavior to achieve their goal. Students with higher self-efficacy also shows a higher level of participation, positive behavior and attitude in mastering the learning outcome of the course. Self-efficacy is not an immutable construct. Self-efficacy can be developed, improved, and polished through many mechanisms. Bandura (1977) explained that developments of self-efficacy in person are derived from four principal; 1) performance accomplishments, 2) vicarious experience, 3) verbal persuasion, and 4) physiological states. The Bandura's self-efficacy model is as Figure 4.

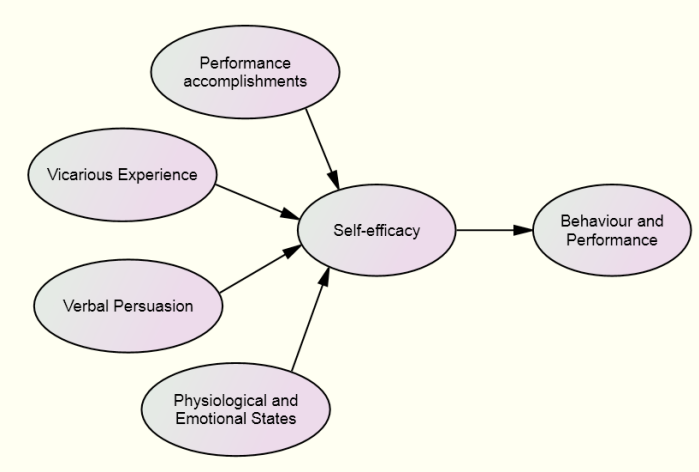


Figure.4: Bandura Self-efficacy Model (1977)

In education point of view, self-efficacy is one of the variable needs to be given attentiondue to its capabilityaffecting other constructs. In 1996, Pajaresalready investigate about the influence of self-efficacy and revealed that self-efficacy able to increase student motivation, learning outcome and academic achievement. High self-efficacy seemed to influence academic achievement when student are highly affected by personal motivation such as goal setting and situational influences (Rahil et al*.,* 2006). The dangerous thing about self-efficacy is generally low self-efficacy students are more likely to believe they cannot be successful. Therefore, they are lack of determination to succeed, low in terms of comprehensive effort and always avoid challenging tasks. Thus, students with poor self-efficacy have low desire and aspiration which in turn results in poor academic performances (Bandura & Locke, 2003). While, students with a strong efficacy are more motivated and like to challenge themselves with the tough task (Margolis & McCabe, 2006). Therefore, this study was interested to assess the extent of learning environmentinfluence student self-efficacy.

The Concept of Psychological Characteristic: Satisfaction

Student's satisfaction need to be viewed in two difference perspective, student as a customer to the company called universities and students as an 'output' of the universities. Student as a customer will be discussed

by quality management perspective and student as an 'output' should be discussed by educational perspective. In quality field, Deming (1986) stressed that customer is the utmost part of the production process. In fact, without someone to purchase the product or service, the company will not perform well in business. The same thing goes with the universities, without student, universities also cannot operated normally. Therefore, the ability to please the customer/student should become the top priority for the company/universities (Deming, 1986). One of the quality expert, Juran (1991) defines customer satisfaction as the result attained when the product or service provided correspond to the needs of its customers. The company is said to achieve the level of customer satisfaction when it meets or exceeds customer's expectation over the lifetime of its product or service. Oliver (1993) stresses that since the satisfaction is defined based customers' perspective, satisfaction improvement projects must begin by studying what the customer/student wants and needs from a company/university.

Earlier researcher, Anderson (1973) proposes that customer/student satisfaction is a function of expectation as well as product or service perception. When a discrepancy exists between the customers' expectations and their perceptions, dissatisfaction occurs. Customer satisfaction with the company can occur at different areas of relationship between the company and its customer including satisfaction with the product or service quality, on-going relationship, and performance of a product (Tax, Brown, and Chandrashekaran, 1998). As for Fornell (1992), he described customer satisfaction as an overall perceived evaluation related to the product or service after the consumption. If the perceived performance of the product or service exceeded the expected performance, then the customer is satisfied. Otherwise, the customer is not satisfied. The idea is supported by Spreng, Mackenzie, and Olshavsky (1996) who stresses that customers are comparing the products' performance with their expectation. The same definition proposed by Zainudin Awang (2007), where author contended that the feeling of satisfaction arises when the customers' perception of products' performance is greater than their prior expectations. If the actual performance exceeds their prior expectations, then they are satisfied. Vice versa, if the actual performance falls short of their prior expectation, then they are dissatisfied. He also suggests that customer/student satisfaction should be employed as a leading criterion in determining the service quality performance actually delivered by the company/university and experienced by its customers.

Coming back to higher education scenario of this study, student satisfaction can be defined as the subjective students perceptions of how well is the quality of learning environment, the support system and service provided by universities contribute to their academic success. According to Moore (2009), a student is considered satisfied when they are successful in the learning and is pleased with their experience. Sweeney and Ingram (2001) bring a similar definition where they defined student satisfaction as the perception of their enjoyment and accomplishment in learning. Both definitions focus on accomplishment and success in learning, pleasure and enjoyment with the learning experience. In year 2002, Thurmond, Wambach, Connors, and Frey in their study described student satisfaction as an outcomes reflection that occurs between students and instructor. While in more recent study conducted by Wu, Tennyson, and Hsia (2010), satisfaction is referred to the student attitude, feeling and hopes to receive a good quality system of learning environment. Based on the commonness in the definition by various researchers, it can be concluded that student satisfaction reflects student's appraisal of the quality in all educational program aspects (Moore, 2005).

The reason of this study interested to bring student satisfaction construct into the model is because of its potential impact on individual behaviour and cognitive development. Many researchers agreed with the positive effect of student satisfaction occurrence. Student satisfaction is claimed to be related to several outcome variables such as persistence (Allen & Seaman, 2007), retention (Debourgh, 1999), course quality (Moore & Kearsley, 1996), and student success (Keller, 1983). Booker and Rebman (2005) agreed with the claim by bringing the evidence in his study that student satisfaction is significantly influence student's retention and decision. Sinclaire (2011) reported that student satisfaction to be the most important key to continuing learning. Winberg and Hedman (2008) in their study also mentioned that student satisfaction is helpful for ensuring students' academic success. Besides that, it has conclusively been shown that student satisfaction is an essential construct that influences the level of student motivation (Chute, Thompson & Hancock, 1999; Donahue & Wong, 1997). More recent study also bring out that high satisfaction leads the students to become more consistent in learning and become high motivate student (Allen & Seaman, 2007). In addition, according to American Psychological Association (1997), satisfaction is one of the major psychological factors that determine student

success. Table 1 shows the recent supporting literature on the relationship between learning environment and psychological characteristics.

Table 1: The Recent Supporting Literature

Relationship	Supporting literature
Learning environment positively affects psychological characteristic of students.	Budsankom et al. 2015; Baeten et al., 2013; Dorman, 2009; Nelson & Debacker, 2008; Patrick et al., 2007; Bong, 2005; Ari & Eliassy, 2003.

METHODOLOGY

This study also restrict to focus on Regression Analysis I subject which implies involvement of two programs from Faculty of computerscience and mathematics (FSKM), namely; Diploma in Statistics (semester 4 and 5) and Diploma in Actuarial Science (semester 4 and 5).

Research Design

This study employed a cross-sectional design since taking measurements at one point in time was adequate. The study will mainly focus on quantitative method in order to achieve the study objectives.

Population and Sample

The target population for this study was the diploma students from Faculty of Computer Science and Mathematics at Universiti Teknologi MARA (UiTM) who had taken Regression Analysis I subject. UiTM has branch campuses in all states in the country. Science Computer & Mathematics courses are only offered at branches from eastern region (UiTM kelantan, UiTM Terengganu and UiTM Raub), northern region (UiTM Tapah, UiTM Kedah and UiTM Perlis) and southern region (UiTM Seremban 3 and UiTM Johor). The regions are divided in such a way in order to ensure homogeneity among campus within one region. For session Jun 2016 to Nov 2016, only UiTM Raub, UiTM Tapah and UiTM Seremban 3 consist a student who have beentaken (semester 5) and are currently taking (semester 4) a Regression Analysis I subject. The details information about the population available for this study is astable 3.1 below;

Table 1: Target Population

Campus	Total Student	Population (N)
Seremban 3	95	
Raub	94	380
Tapah	191	

Sampling and Data Collection

Since the target population was clustered together in different campuses geographically, cluster sampling was considered as the most appropriate sampling design for this study which resulted 2 campuses were selected. Randomly, UiTM Raub and UiTM Tapah were chosen for data collection whereas UiTM Seremban 3 was used for pilot study. The study obtained only the list of students from Diploma in Statistic and Diploma in Actuarial Science since those students were in the position to provide their opinion for items under the respective construct of the study. In other words, these students had experience in learning the Regression analysis subject. Therefore, 94 students from UiTM Raub and 191 students from UiTM Tapah with a total of 285 students became the respondent for quantitative study. This 285 sample was more than enough to fulfil the rule of thumbs set by Hair et.al. (2013) which is sample size should be at least 10 times the largest number of structural paths directed at a particular construct in the structural model.

Instrumentation

This study is intended to evaluate the perceived physical quality as well as the perceived psychosocial learning environment quality in teaching and learning process of Regression Analysis I subject from the perspective of diploma students. The study is also intended to assess the level of students' self-efficacy, and satisfaction with their experienced of learning the subject. Realizing that UiTM students consist of different demographic and socio-economic background, the study incorporated certain demographic variables in the questionnaire. The questionnaire consists of five sections. Section A will cover information on demographic variables while Section B, C, D,and E cover on physical learning environment, psychosocial learning environment, student self-efficacy, sand lastly student satisfaction variables respectively with 1 to 9 likert scale.

Table 2: The Summary of Instruments Used in Questionnaire

Construct	Items	Source	Expert Validation
Physical learning enviroment	24	Adapted from; -Smart classroom inventory,SCI (Bao, 2015) -Science Laboratory Environment Inventory, PSLEI (Che Nidzam et al., 2014)	Prof. Madya Dr. Che Nidzam Che Ahmad (UPSI)
Psychosocial leaning environment	33	Adopted from College and Classroom Environment Inventory, CCEI (Fraser, 1998)	Prof. Madya Dr. Che Nidzam Che Ahmad (UPSI)
Academic Self-efficacy	8	Adapted from Self-Efficacy in Learning and Performance for College. (Pintrich et al, 1991).	Dr. Mazlina Mamat (UiTM)
Student's satisfaction	8	Adapted from Test Of Science-Related Attitudes, TOSRA (Fraser, 1981).	Prof. Madya Dr. Che Nidzam Che Ahmad (UPSI)

Pre-test for the instrumentation validation was performed by field expertise fromdifferent university. Five former student of Diploma in Statisticalso involved in instruments pre-test and they agreed that the items in questionnaire are understandable and not confusing. Then, prelimenary study was conducted to pilot the extent of how reliable is the items from inventory in measuring the intended latent construct. The study involved 30 student of Diploma in Acturial Science, UiTM Seremban 3. The resultof pre-test and pilot test can be concluded that items in questionnaire are understandable to read and statistically all the construct give an acceptable reliability (above 0.7) values with items of factor loading greater than 0.6. Only three items were deleted due to low factor loading value. The result of pilot study was summarised in Table 3.2 and the summary of final instruments is described as intable 3 below.

Table 3: Summary of Preliminary Results on Reliability of Instruments

Construct	Sub-construct	Cronbach alpha Value		No. of final items
		Before	After	
Physical Learning environment	Physical design	0.906	0.906	22
	Learning space	0.910	0.941	
	Technology	0.885	0.902	
	Indoor air, temperature and lighting quality	0.855	0.855	
Psychosocial Learning environment	Attitude toward students	0.946	0.946	32
	Autonomy-power sharing	0.747	0.879	
	Student-student relationships	0.921	0.921	
	Student interest-motivation	0.947	0.947	
	Class organization	0.917	0.917	
Self-efficacy	Academic self-efficacy	0.975	0.975	8
Satisfaction	Student satisfaction toward Regression Analysis subject	0.978	0.978	8

Techniques of Data Analysis

Data analysis covered data coding, data screening and choosing the most suitable data analysis strategy (Churchill & Lacobucci, 2004). Data screening was performed to identify data entry errors and to examine the statistical assumptions of analysis which involve checking for missing data, outlier, and normality. After screening the data, cleaning the data is necessary. Data cleaning include the process of removing errors and inconsistencies in the data (Galhardas, Florescu, Shasha, & Simon (1999). The data will be analysed using Partial Least Square-Structural Equation Modelling (PLS-SEM).

RESULT AND FINDINGS

Response Rate

The population of this study was 380 respondents and based on cluster sampling, 285 respondents became a target sample. Out of the target sample, 277 respondent was succesfully participate in quantitative study wherease 183 students from UiTM Tapah and 94 students from UiTM Raub. The response rate for the study was 97.19% and this number are more than sufficient for further analysis.

Data Screening

Missing data is screening using SPSS, and AMOS software is used for outliers and normality assesment.

Missing Values Analysis

Based on Cavana, Delahaye and Sekaran (2001), missing data is one of the major concerns in quantitative research due to its capability to affect results negatively. In classical method, missing data is impute using mean median or mode imputation. For this study, expecation maximazation(EM) was used which is more recent approach. By using expectation maximization (EM) method from SPSS, there are no missing data found.

Outliers Assessment

There are many different methods of detecting outliers within a given research, among which include classifying data point based on observed (Mahalanobis) distance from the expected research (Hair, Anderson & Tatham, 2006). Mahalanobis analysis can be conducted through SPSS in regression. Outliers' detection has its basis on whether D2 values are more than the chi square values ($\chi 2$) of the number of items used. The table of chi-square statistics was applied as the threshold value to determine the empirical optimal values. In this case, seventy (70) items were entered as variables, and so any individual with a Mahalanobis Distance score (D2) which is greater than () = 111.055 would be considered a multivariate outlier and may be excluded from further analysis using this set of variables. Fourty one (41) outliers were detected but the study only exclude thirteen (13)

serious outliers. After the deletion, the data were reduced to 264 responses for further analysis.

Normality Assesment

PLS-SEM did not have normality assumption but normality still need to be checked to view the distribution of the data. As for the kurtosis, high value of kurtosis may influence the result of analysis because of the data need to have variability to make sure the partial least square methods is valid to apply. Result for kurtosis and skewness values was generated using AMOS software. All skewness values were between -1 to 1 with kurtosis below 5. Hence, there are non-significant skewness and kurtosis for items which indicates normality and have a good variability.

The Descriptive Analysis of Respondent Demographic Profile.

The descriptive analysis was used in order to examine the demographic profile of the respondents.Most of the respondents were mainly females which constituted 76.5 percent (202). 7.6 percent (20) of respondents' age were below 20 years old and 92.4 percent (244) were between the age of 20 to 22 years old. The allocation of the respondents are 65.9 (174) percent from UiTM Tapah and 34.1 (90) percent from UiTM Raub and majority of the respondents 90.2 percent (238) were from semester 5 students. In term of study program, 44.3 percent (117) of respondents were from Diploma of Actuarial Science and 55.7 percent (147) were from Diploma in Statistic.

Structure of the Quantitative Analysis

PLS model are analysed and interpreted in two sections. Firstly, the measurement model is tested to ensure its reliability and validity which included indicator reliability, internal consistency reliability, convergent validity, and discriminant validity are observed by conducting confirmatory factor analysis (CFA). Secondly, the structural model investigated hypotheses, R square (R^2,) effect size (f^2) and predictive relevance (q^2) of the model. Bootstrapping are employed to test the hypotheses.

The study model consists of seventy (70) reflective measurement items (manifest variable or indicator) for seven (7) variables comprising two (2) independent variables with nine (9) dimensions, and two (2) dependent

variables. Physical learning environment had four dimensions of first order construct (PD,LS,T and I), and psychosocial learning environment had five dimensions of the first order construct (ATS, APS, SSR, SIM and CO). Becker, Klein and Wetzels (2012) have greatly discussed about hierarchical latent variable models in PLS-SEM. As they suggested, this study decided to use a Reflective-Formative Type model for higher order construct (HOC). There are three approaches available to measure HOCs: the repeated indicator approach (lohmoller,1989), the hybrid approach (wilson and Henseler, 2007) and the two-stage approach (Ringle et al., 2012). Becker et. al. (2012) proved in their simulation study that repeated indicator approach and two stage apporach are more approriate with less biased result when dealing with reflective-formative higher order construct. Therefore for this study, the reflective-formative higher order construct is analyzed using repeated indicator approach by Mode B measurement.

Assessment of Measurement Model for the Study

In order to evaluate the measurement model, reliability and validity tests were used. According to Sekaran and Bougie (2010), reliability is to test how consistently a measuring instrument measures whatever concept it is measuring, while validity is a test of how well an instrument that is developed measures the particular concept it is intended to measure. In assessing the reflective measurement items, Hair *et al.,*(2011), recommended to achieve satisfaction in realibility (indicator reliability, and internal consistency reliability), convergent and discriminant validity.

Indicator and internal consistency reliability

Reliability is the extent of how reliable is the said measurement model in measuring the intended latent construct. For indicator reliability, Hair et al., (2011) and Valerie (2012) suggested that indicator loadings (factor loadings) should be higher than 0.7. During the deletion stage, all of the outer loadings are above the minimum requirement of 0.7, with the exception of APS1 which is loading of 0.696, APS2 (FL=0.692), CO6 (FL=0.691) and PD6 (FL=0.637). PD2 (FL=0.724) also was removed to improved the reliability of the construct. Therefore, these five items were deleted. The values of all the acceptable outer loading after deletion process is shown in table 4.3.

Another assessment to be put into consideration is the assessment of internal consistency reliability where it were assessed through measuring the composite reliability (CR) and Cronbach alpha. Composite reliability values reflect the level to which construct indicators reveal the latent variables and they should be greater than 0.70. Cronbach's alpha coefficient was also developed in this study to examine the inter-item consistency of the measurement items. Based on Hair *et al.,*(2011) and Valerie (2012), the Cronbach alpha (CA) and composite reliability (CR) should be higher than 0.7.

Based on the table 4, all the composite reliability values and the cronbach alpha values ranged from 0.850 to 0.980 which depicts the degree to which the construct indicators indicate the latent, and construct ranged which exceeded the recommended value of 0.7 (Hair et al., 2010). All the cronbach's alpha (CA) and composite reliability (CR) exceeded the recommended value of 0.70, indicating that the measurement scale used in this study had high internal consistency (Sekaran & Bougie, 2010 and Henseler et al., 2009).

Table 4: Factor Loading, Composite Reliability and Cronbach Alpha Value

Construct	Loading	Composite Reliability (CR)	Cronbach Alpha (CA)	Average Variance Extracted (AVE)
Physical Design		0.881	0.919	0.739
PD1	0.791			
PD3	0.868			
PD4	0.896			
PD5	0.879			
Learning Space		0.874	0.909	0.666
LS1	0.788			
LS2	0.799			
LS3	0.892			
LS4	0.799			
LS5	0.797			

Construct	Loading	Composite Reliability (CR)	Cronbach Alpha (CA)	Average Variance Extracted (AVE)
Technology		0.903	0.926	0.675
T1	0.819			
T2	0.857			
T3	0.811			
T4	0.875			
T5	0.757			
T6	0.805			
Indoor air, temperature and lighting quality		0.849	0.891	0.62
I1	0.776			
I2	0.802			
I3	0.813			
I4	0.807			
I5	0.737			
Attitude towards Student		0.922	0.939	0.72
ATS1	0.802			
ATS2	0.846			
ATS3	0.883			
ATS4	0.885			
ATS5	0.828			
ATS6	0.845			
Autonomy power sharing		0.85	0.91	0.772
APS3	0.768			
APS4	0.938			
APS5	0.92			

Construct	Loading	Composite Reliability (CR)	Cronbach Alpha (CA)	Average Variance Extracted (AVE)
Student-student relationship		0.908	0.927	0.646
SSR1	0.71			
SSR2	0.83			
SSR3	0.801			
SSR4	0.849			
SSR5	0.803			
SSR6	0.834			
SSR7	0.792			
Student interest and motivation		0.95	0.959	0.769
SIM1	0.809			
SIM2	0.875			
SIM3	0.899			
SIM4	0.897			
SIM5	0.877			
SIM6	0.893			
SIM7	0.885			
Class organization		0.931	0.946	0.746
CO1	0.816			
CO2	0.874			
CO3	0.898			
CO4	0.895			
CO5	0.891			
CO7	0.803			
Satisfaction		0.969	0.82	0.82
SA1	0.88			
SA2	0.924			
SA3	0.919			
SA4	0.925			

Construct	Loading	Composite Reliability (CR)	Cronbach Alpha (CA)	Average Variance Extracted (AVE)
SA5	0.894			
SA6	0.913			
SA7	0.877			
SA8	0.912			
Academic self-efficacy		0.969	0.973	0.82
SE1	0.888			
SE2	0.906			
SE3	0.901			
SE4	0.899			
SE5	0.914			
SE6	0.901			
SE7	0.915			
SE8	0.922			

Convergent Validity

Convergent validity is asses using average variance extracted (AVE). Average variance extracted (AVE) measures the variance captured by the indicators relative to measurement error should be higher than 0.50 in orders to justify the use of the construct (Hair *et al.,*2011; Valerie, 2012). In this study, the AVEs ranged from 0.656 to 0.736, which were all within the suggested range.

Table 5: Summary of Average Variance Extracted Values

Construct	Average variance extracted (AVE)
Physical Design (PD)	0.739
Learning Space (LS)	0.666
Technology (T)	0.675
Indoor air, temeprature and lighting (I)	0.620
Attitude towards student (ATS)	0.72

Construct	Average variance extracted (AVE)
Autonomy power sharing (APS)	0.772
Student-student relationship (SSR)	0.646
Student interest and motivation (SIM)	0.769
Class organization (CO)	0.746
Satisfaction (SA)	0.82
Self efficacy (SE)	0.82

Discriminant Validity

Discriminant validity is the extent to which a construct is different from other constructs. According to Hair et al., (2011), the discriminant validity stipulates that each latent constructs' AVE should be higher than the construct's highest squared correlation with other latent construct (Fornell-Larcker, 1981) and the indicator's loadings should be greater than all its cross loadings. Another way to asses discriminant validity is by using heterotrait-monotrait ratio of correlations (HTMT) where HTMT below 0.9 means that the discriminant validity is established.

Table 6: Discriminant Validity

	APS	ATS	CO	I	LS	PD	SA	SE	SIM	SSR	T
APS	0.87										
ATS	0.61	0.84									
CO	0.62	0.69	0.86								
I	0.37	0.41	0.36	0.78							
LS	0.54	0.52	0.55	0.48	0.81						
PD	0.48	0.51	0.52	0.39	0.74	0.86					
SA	0.40	0.51	0.52	0.26	0.47	0.36	0.90				
SE	0.41	0.54	0.55	0.36	0.54	0.44	0.77	0.90			
SIM	0.62	0.69	0.81	0.31	0.55	0.51	0.57	0.54	0.87		
SSR	0.48	0.59	0.57	0.24	0.40	0.37	0.47	0.47	0.65	0.80	
T	0.49	0.52	0.56	0.42	0.71	0.70	0.47	0.54	0.54	0.47	0.822

In this study, discriminant validity of the measure was assessed through Fornell and Larcker's (1981) criterion. All constructs had the values of AVE square root in diagonal were greater than the squared correlation with other constructs in off diagonal, showing that all constructs met the acceptable standard of discriminant validity (Henseler *et al.,*2009). The value of heterotrait-monotrait (HTMT) ratio of correlations for each construct also shows the value below 0.9 which indicate discriminant validity achieved.

In sum, all the constructs have achieved reliability and validty. The study involved higher order construct which are physical learning environment and pshycosocial learning environment. Therefore, before proceed with structural modeling. The study asses the higher order construct in the next section.

Assesment of Formative Higher Order Construct

Empirical assesment of formative measurement models is not the same as with reflective measurement models. This is because the indicators theoritically represent independent causes of the constructs and thus do not necessesaily highly correlated. As a result, internal consistency reliability, and convergent validity are not appropriate. Instead, focus should be given toward establishing the content validity of the construct's indicators. This study used reflective-formative type II model and employed repeated indicator approach mode B. For formative contsructs, multicolinearity of indicators, indicators weights, significant of weights and significant of the indicators loading should be reported (Hair et al, 2013; Becker et al, 2012). It is important to note that the role of weights and loadings are important for the assesment and they are obtained from the relations between higher order construct and lower order construct (Becker et al, 2012). The study used repeated indicator approach, therefore weight and loading are now represented by the path coefficients between higher-order and lower order constructs and not by the manifest indicators that repeated at construct level.

Before looking at the significant of the path, collinearity of the model constructs must be checked by calculating the variance inflation factor (VIF) values and it should be less than 5. The results of these analyses may be biased if collinearity is present (Hair *et al.,*2014). In this study, multicolinearity does not exist for both physical learning environment

and psychosocial learning environment higher order construct wherese the results for VIF were all less than 5 as suggested by Hair *et al.*,(2011). Refer toTable 7.

Table 7: Variance Iinflation Factor (VIF) Results

Construct	Physical Learning Environment (PLE)	Psycosocial Learning Environment (PsyLE)
Physical Design (PD)	2.567	
Learning Space (LS)	2.814	
Technology (T)	2.378	
Indoor air, temeprature and lighting (I)	1.332	
Attitude towards student (ATS)		2.407
Autonomy power sharing (APS)		1.888
Student-student relationship (SSR)		1.894
Student interest and motivation (SIM)		3.724
Class organization (CO)		3.39

After obtaining that the constructs did not have multicolinearity problems, the next step is the assesment of the path coeficient for the lower order contruct to higher order. This step required bootstraping procedure. The result of the significant of the path coeficient is shown in Table 8 below.

Table 8: Signifince of Path Coefficient

Path	Path coefficient	T Statistics (|O/STDEV|)	P Values
APS → PsyLE	-0.015	0.142	0.444
ATS → PsyLE	0.337	2.603	0.005
CO → PsyLE	0.265	2.035	0.021
SIM → PsyLE	0.338	2.645	0.004
SSR → PsyLE	0.205	1.895	0.029
I → PLE	0.107	0.733	0.232
LS → PLE	0.533	3.572	0.000
PD → PLE	-0.116	0.880	0.189
T → PLE	0.567	4.217	0.000

Looking at the relative importance of the lower order contruct in contributing to Psycosocial Learning environment (PsyLE) as higher order construct, student interest and motivation (SIM=0.338) is the most important, followed by attitude towards student (ATS=0.337) class organisation (CO=0.265) and Student-student relationship (SSR=0.205). While autonomy power sharing (APS=-0.015) give unsignificant contribution to psycosical construct. Even so, autonomy power sharing is retained in the model. For Physical learning environmnet (PLE) construct, technology dimension (T=0.567) ia a primary contributor, followed by learning space (LS=0.533). In contrast, physical design (PD=-0.116) and indoor air, temperature and lighting quality dimension (I=0.107) were not significantly contributing to physical learning environmnet. These two lower order construct are still retained in the model.

The Structural Model Assessment

Once the measurement model have been confirmed as reliable and valid, the next step is to assess the structural model results. This involves examining the model's predictive capabilities and the relationships between contsructs. Before assesing the structural model, collinearity for the structural model construct need to be examined. The reason is that the estimation of path coefficients in the structural model is based on ordinary least square (OLS) regressions of each endogeneous latent variable on its corresponding predecessor constructs. Just as in a regular multiple regression, the path coefficient might be biased if the estimation involves significant levels of colliniarity among the predictor constructs. After checking for collinearity, assesment continues with the level or the coeffient of determination R^2 values, the f^2 effect size, the predictive relevance and the significant of the path coefficient.

Table 9: VIF Values for Independent Constructs

	SE	SA
Physical learning environment (PLE)	1.757	1.757
Psychosocial learning environment (PsyLE)	1.757	1.757

Assesment of effect size (f^2) and coeffient of determination (R^2)

The quality of the structural model can be assessed by R^2, values and effect sizes, and it also can be assessed by using blindfolding procedure to generate the cross validated communality and cross validated redundancy. Coefiecient of determination revealed the percentage of variation in endogenoeus construct is explain by exogeneous construct. While, the f^2 effect size measures the change in R^2 value when a specified exogeneous construct is omiited from the model. Based on Chin (2010), it is good to determine the effect sizes of specific latent variables' impact upon the dependent variables with the help of f^2 analysis which is complementary to R^2. In easier word, the effect size is asses to identify either the amount of R^2 is large enough to be meaningful. Using Smart PLS 3, the R^2 values and f^2 effect size was automatically provided.

Table 10: R^2 and f^2 Effect Size of Latent Constructs Result

	R^2	f^2 effect size	
		SE	SA
Self efficacy (SE)	0.476		
Satisfaction (SA)	0.420		
Physical learning environment (PLE)		0.142**	0.059*
Psychosocial learning environment (PsyLE)		0.170**	0.208**

According to Hair *et al*., (2011), R^2 values of 0.75, 0.50 or 0.25 for endogenous latent variables in the structural model can be described as substantial, moderate or weak, respectively. The R^2 values of satisfaction construct (0.420) and Self efficacy (0.476) are considered moderate. Based on Cohen (1988), the f^2 values of 0.02, 0.15 and 0.35, were used to interpret small, medium and large effects sizes of the predictive variables, respectively. The result of effect size shows that Physical learning environment (PLE) has a small effect in producing the R^2 for SA (0.059), and has close to medium effect to SE (0.142). While, Psychosocial learning environment (PsyLE) has all moderate effect size on SE (0.170), and SA (0.208).

Assessment of predictive relevance

Another criterion for the evaluation of the structural model is the predictive relevance Q^2, which is a measure that reflects how well observed values are reconstructed by the model and its parameter estimates (Chin, 2010). Q^2 values are obtained using a blindfolding procedure (Hansmann & Ringle, 2005).

Table 12: Prediction Relevance of the Model

Total	SSO	SSE	Q² (=1-SSE/SSO)
Satisfaction (SA)	2,112.00	1,437.61	0.319
Academic self-efficacy (SE)	2,112.00	1,352.52	0.360

Blindfolding procedure was performed to calculate the predictive relevance (Q^2) of the model fit. As claimed by Hair *et al.,*(2011), the model will have predictive quality if the cross-redundancy value is more than zero or otherwise the predictive relevance of the model cannot be concluded. The results above show that the obtained cross validated redundancy values for satisfaction and self-efficacy were found to be 0.319 and 0.360, respectively. According to Hair *et al*., (2011), a relative measure of predictive relevance Q^2 values of 0.02, 0.15 and 0.35 indicate that an exogeneous construct has a small, medium or large predictive relevance. These results show a range of Q^2 between 0.319 and 0.360 support the suggestion that the model has an adequate prediction quality.

Hypotheses Testing

The hypotheses of this study were tested by examining the path coefficients (β) through structural equation modelling using the PLS approach. The path coefficients generated by PLS provide an indication of the relationships and can be used similar to the traditional regression coefficients (Gefen, Straub & Boudreau, 2000). The bootstrapping technique was used to obtain the t-values of each coefficient (Chin, 2010 and Bakshi & Krishna, 2009). The t-values of the parameter indicate the strength of the relationship the parameter represents; therefore the higher the t-value, the stronger the relationship is (Huang, Lin & Chuang, 2007). Final structural model is shown in figure 1 and table 13 summarise the path coefficient for the model.

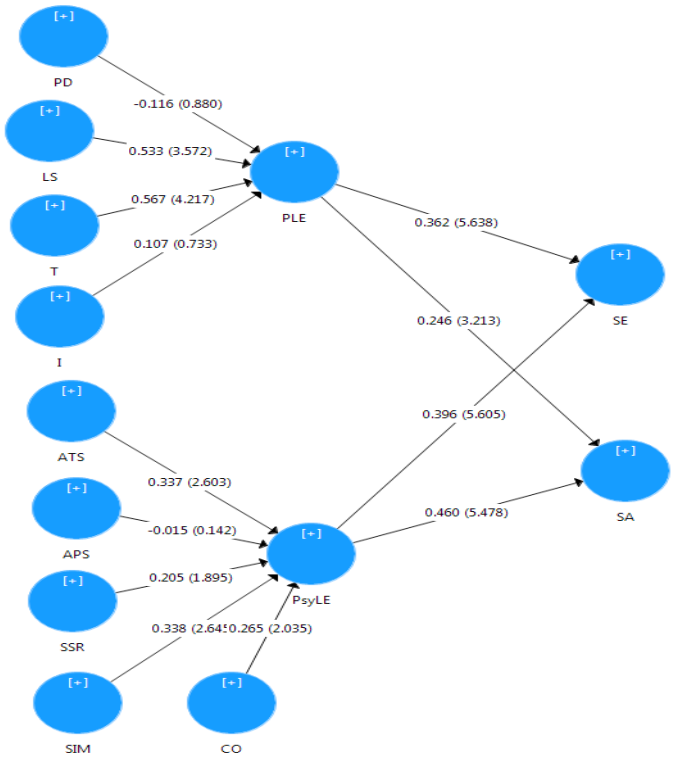


Figure 1: Final Structural Model

Table 13: The Path Coefficent

Relationship	Path coefficient	T Statistics (|O/STDEV|)	P Values	Result
PLE → SA	0.25	3.213	0.001	Significant
PLE → SE	0.36	5.638	0.000	Significant
PsyLE →SA	0.46	5.478	0.000	Significant
PsyLE →SE	0.40	5.605	0.000	Significant

The results above showed that the physical learning environment construct has a significant direct relationship with satisfaction (ß = 0.25 p-value = 0.001) and self-efficacy (ß = 0.36 p-value = 0.000). On the other

hand, the result also indicates that psychosocial learning environment has a significant influence on satisfaction ((ß = 0.46 p-value = 0.000) and self-efficacy (ß = 0.40 p-value = 0.000).

CONCLUSION

This study found that quality of learning environment has a significant and direct influence on students' psychological characteristic (satisfaction and self-efficacy). This result is consistent with Baetan, Dochy and Struyven (2013) who study the effect of different learning environment. This result is also consistent with the findings of Budsankom et al., (2015), Dorman (2009), Nelson and Debacker (2008), Patrick et al (2007), and Bong (2005). All of the them support that learning environment positively affects psychological characteristic of student.

The study attempts to make several contributions. Firstly, the empirical findings of this study will help to clarify the impact of learning environment on the psychological characteristics development focusing on self-efficacy and satisfaction. Thus, by understanding the relationship, strategies could be developed to enhance quality of the learning environment in universities. For policy makers, this result may assist in assessing and determining the appropriateness of the existing quality of learning environment that regulate good psychological characteristic of students. Secondly, by applying SEM-PLS, this study is able to demonstrate the simultaneous effects of these multiple variables to the firm performance. This study would be of benefit to academicians in enhancing their knowledge and thoughts relating to the variables under investigation within the Malaysian context. This study also contains reflective-formative model of higher order construct with repeated indicator approach mode B which also will give benefits to academician in studying SEM-PLS.

The study offers the some direction for future researches in this area. First, The respondents of this study consist of only the Bumiputera students in this country. Since this country consists of many ethnic groups, this study recommends future research to include all ethnic groups so that the comparison can be made between groups. And since different ethnic groups have distinct socio-economic background, the result might be interesting.

Second, This study focused only on the Faculty of Computer Science and Mathematics, and hence the generalization might not be appropriate to other faculties. This study also only focuses on statistic education. Future researches should include more faculties in the university so that comparisons can be made between faculties. Since different faculties require different academic facilities, such as social sciences, pure sciences, and arts, the information obtained would be useful to the management of a university for their strategic planning. Third, This study was carried out in Universiti Teknologi Mara (UiTM) which is one of the twenty public universities in the country. The future research should include all public universities so that the comparisons can be made between public universities. More importantly, how the old universities perform compared to the newly established universities, as far as quality of learning environment is concerned. Last but not least, this study was done on the public university. The findings might not be generalizable on private universities even though both types of universities are in the same service industry. Today, the number of private universities has surpassed the number of public universities. Thus future researches should include both types of universities. The result might be interesting since these two types of universities have distinct characteristics such as the facilities, cost of study, and the source of financing.

REFERENCES

Allen, I. Elaine & Jeff Seaman, (2007),*"Online Nation: Five Years of Growth in Online Learning,"* The Sloan Consortium, Needham, Mass.

Ambrose S.A., Bridges MW, DiPietro M, Lovett MC, Norman MK (2010). How Learning Works: Seven Research-Based Principles for Smart Teaching. San Francisco, CA: Jossey-Bass.

American Psychological Association. (1997). *Learner-centered Psychological Principles: A framework for school redesign and reform*. Washington, DC.

Anderson, R.E. (1973). "Consumer dissatisfaction: The effect of disconfirmed Expectancy on Perceived Product Performance. *Journal of Marketing Research*, 38-44.

Baek, S.G., & Choi, H.J. (2002). The relationship between students' perceptions of classroom environment and their academic achievement in Korea. *Asia Pacific Education, 3, 125–135.*

Baeten M, Dochy F, Struyven K (2013). The effects of different learning environments on students' motivation for learning and their achievement. Br. J. Educ. Psychol. 83:484-501.

Bakshi, S., & Krishna, S. (2009). Empirical analysis of the impact of virtuality on flexibility of virtual teams in software development projects. *Proceedings AMCIS.*

Bandura, A. (1997). *Self-Efficacy: The exercise of control.* New York: W.H. Freeman And Company.

Bandura, A. J. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84(2), 191-215.*

Bandura, A. J. (1986). *Social foundations of thought and action.* Englewood Cliffs, N.J.: Prentice-Hall.

Bandura, A., & Locke, E.A. (2003). Negative Self-Efficacy and Goal Effects Revisited. *Journal of Applied Psychology*, Vol. 88(1), 87–99.

Bao, P.L., Siu, C.K., & Guang, C., (2015). Development and validation of the smart classroom inventory. Smart Learning Environments. *Springer Open. 2(3).*

Becker, J. M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in PLS-SEM: guidelines for using reflective-formative type models. *Long Range Planning,* 45(5/6), 359-394.

Bong M (2005). Within-grade changes in Korean girls' motivation and perceptions of the learning environment across domains and achievement levels. J. Educ. Psychol. 97:656-672.

Booker, Q. E., & Rebman, C. E. (2005). E-student retention: Factors affecting customer loyalty for online program success. *Issues in Information Systems, 1(1), 183-189.*

Budsankom, P., Sawangboon T., Damrongpanit S., & Chuensirimongkol J., (2015). Factors affecting higher order thinking skills of students: A meta-analytic structural equation modeling study. Academic Journal 10 (9). 2639-2652.

Cavana, R., Delahaye, B. L., & Sekaran, U. (2001). *Applied Business Research: Qualitative and Quantitative Methods*. Australia: John Wiley and Sons.

Chang, V., & Fisher, D. L. (2001). *A new learning instrument to evaluate online learning in higher education*. In M. Kulske & A. Herrmann (Eds.), New horizons in university teaching and learning. Perth: Curtin University of Technology.

Che Nidzam, C.A., Kamisah O., & Lilia H. (2014). The Establishment of Physical Aspects of Science Laboratory Environment Inventory (PSLEI). *Journal of Turkish Science Education, 11 (2).*

Chin, W.W. (2010). How to write up and report PLS analyses, In Esposito, V.V., Chin, W.W., Henseler, J. &Wang, H. (Eds), *Handbook of Partial Least Squares: Concepts, Methods and Applications in Marketing and Related Fields* (655-690). Berlin: Springer.

Churchill, G. A., & Iacobucci, D. (2002). *Marketing research-Methodological foundations*. Australia: South Western Thomson Learning.

Chute, A. G., Thompson, M. M., & Hancock, B. W. (1999). *The McGraw-Hill handbook of distance learn-ing*. New York: McGraw-Hill.

DeBourgh, G. A. (1999). Technology is the tool, teaching is the task: Student satisfaction in distance learn-ing. *Proceedings of Society for Information Technology & Teacher Education International Conference*, San Antonio, TX, (131-137).

Deming, W. Edwards. (1986). *Out of the Crisis*. Cambridge, MA: MIT Center for Advanced Engineering Studies.

Donahue, T. L., & Wong, E. H. (1997). Achievement motivation and college satisfaction in traditional and nontraditional students. *Education, 118*, 237- 243.

Dorman JP (2009). Associations between psychosocial environment and outcomes in technology- rich classrooms in Australian secondary schools. Res. Educ. 82(1):69-84.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equations models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(*1),* 39-50.

Fornell, C., (1992). A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing*, 56 (1), 6-21.

Fraser, B. J. (1998). *Science learning environment: Assessment, effects and determinants. International Handbook of science education (527–564).* Dordrecht, The Netherlands: Kluwer.

Fraser, B.J. (1981). Test of science-related attitudes (TOSRA) handbook. Melbourne: Australian Council for Educational Research.

Galhardas, H., Florescu, D., Shasha, D., & Simon, E. (1999). *An Extensible Framework for Data Cleaning.* INRIA, Rocquencourt: Technical Report.

Gardiner, W.L. (1989). Forecasting, Planning and the future of information society. In Goumain, P.(Ed.), *High Technology Workplace: Integrating Technology, Management and Design for the Productive Work Environments* (27-39). New York: Van Nostrand Reinhold.

Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS- Graph: Tutorial and annotated example. *Communications of the Association for Information Systems, 16,* 91-109.

Gefen, D., Straub, D. W., & Boudreau, M. C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, *4(1*), 1–79.

Golightly T.R. (2007). Defining the Components of Academic Self-Efficacy In Navajo American Indian High School Students. Unpublished Doctorial Dissertation, Brigham Young University.

Hair, J. F., Jr., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, *46(1/2),* 1–12.

Hair, J., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th Ed.). Upper saddle River, New Jersey: Pearson Education International.

Hair, J., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A Primer on Partial Least Squares Structural Equation Modeling.* Thousand Oaks: Sage.

Hair, J., Ringle, C., & Sarstedt, M. (2011). PLS-SEM: indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19(2),* 139-152.

Hair, J.F., Anderson, R.L. & Tatham, W.C. (2006), *Multivariate Data Analysis with Reading* (6th ed). Upper Saddle River, NJ: Prentice-Hall.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing, 20*, 277– 320.

Hijazi, S. T., & Naqvi, S. M. M. R. (2006). Factors affecting students' performance: A case of private colleges. *Bangladesh e-Journal of Sociology, 3.*

Huang, J., Lin, Y., & Chuang, S. (2007). Elucidating user behavior of mobile learning: A perspective of the extended technology acceptance model. *The Electronic Library*, *25(5),* 586-599.

Juran, J.M. (1991). "World War II and the quality movement", Quality Progress, Vol. 24 (12), 19-24.

Keller, J.M. (1983). "Motivational design of instruction. In C.M. Reigeluth (Ed.). Instructional design theories and models: An overview of their current status." Hillsdale, NJ: Erlbaum.

Kember, D., Ho, A., & Hong, C. (2010). Characterising a teaching and learning environment capable of motivating student learning. *Learning Environments Research, 13, 43–57.*

Khine, M. S. (2002), "Study of learning environment for improving science". In S. C. Goh and M. S. Khine (Eds.), "Studies in educational learning environments: An international perspective". River Edge, NJ: World Scientific.

Kilgour, P. W. (2006). Student, teacher and parent perceptions of classroom environments in streamed and unstreamed mathematics classrooms. Thesis presented for the Degree of Doctor of Mathematics Education of Curtin University Technology.

Lewin, K. (1936). *Principles of Topological psychology.* NY: McGraw-Hill.

Lizzio, A., Wilson, K., & Simon, R. (2002). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. *Studies in Higher Education, 27, 27–52.*

Lohmoller, J.B., (1989). Latent Variable Path Modeling with Partial Least Squares. Physica-Verlag, Heidelberg, Germany.

Margolis, H. & McCabe, P.P. (2006). Improving self-efficacy and motivation: What to do, what to say. *Intervention in School & Clinic, 41(4) 218-227.*

McGrew, K. (2010). Model of Academic Competence & Motivation (MACM). Institute for Applied Psychometrics (IAP).

McRobbie, C. J., & Fraser, B. J. (1993). Associations between student outcomes and psychosocial science environment. Journal of Educational Research, 87, 78– 85.

Moore, J. C. (2009). A synthesis of Sloan-C effective practices: December 2009. *Journal of Asynchronous Learning Networks, 13*(4), 84-94.

Moore, J.C. (2005). The Sloan Consortium Quality Framework and the Five Pillars. The Sloan Consortium.

Moore, M. G., & Kearsley, G. (1996). *Distance education: A systems view*. Belmont, CA: Wadsworth Pub-lishing Company.

Moos, R.H. (1979). *Evaluating Educational Environments: Procedures, Measures, Finding and Policy Implication*. San Francisco: Jossey-Bass.

Nelson RM, Debacker TK (2008). Achievement Motivation in Adolescents: The Role of Peer Climate and Best Friends. J. Exp. Educ. 76(2): 170-189.

Okurut, C. O. (2010). Classroom learning environment and motivation towards mathematics among secondary school students in Uganda. *Learning Environments Research, 13, 267–277.*

Oliver, R. L. (1993). Cognitive, Affective and Attribute Bases on the Satisfaction. *Journal of Consumer Research, 20*(1).

Pajares, F. (1996). *Self-efficacy beliefs in academic settings*. *Review of Educational Research,* 66(4),543-578.

Patrick H, Ryan A, Kaplan A (2007). Early adolescents' perceptions of the classroom social environment, motivational beliefs, and engagement. J. Educ. Psychol. 99:83-98.

Peter, J. P. (1981). Construct validity: A review of basic issues and marketing practices. *Journal of Marketing Research*, *18*, 133-145.

Pintrich, R.P., Smith D.A., Garcia .F., McKeachie T.W.J., (1991). A manual for the use of the Motivated Strategies for Learning Questionnaire (MSQL). Ann Arbor: Michigan, 48 (1991), 109–12.

Rahil, M., Habibah, E., Loh, S.C., Muhd Fauzi, M., Nooreen, N. & Maria, C.A. (2006). The Relationship Between Students' Self Efficacy And Their English Language Achievement. *Jurnal Pendidik dan Pendidikan*, 21, 61–71.

Ramayah, T., Lee, W. C., & Boey, C. I. (2011). Network Collaboration and Performance in the Tourism Sector. *Service Business*, *5(4),* 411-428.

Ringle, C.M., Sarstedt, M., Straub, D.W., (2012). Editor's comments: a critical look at the use of PLS-SEM in MIS quarterly. MIS Quarterly 36 (1), iii-xiv.

Santrock J.W., (2009). Educational psychology. New York, NY: McGraw Hill.

Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach* (5th ed). Chichester: John Wiley & Sons Ltd.

Sinclaire, J. (2011). Student satisfaction with online learning: Lessons from organizational behavior. *Research in Higher Education Journal, 11*, 1-18.

Sloan. (2011). *The 5 Pillars of Quality Online Education*. The Sloan Consortium.

Spreng, R. A., Mackenzie, S. B., & Olshavsky, R. W. (1996). A Re-Examination of the Determination of Consumer Satisfaction. *Journal of Marketing, 60,* 15-32.

Stajkovic AD, Luthans F (2003). "Social cognitive theory and self-efficacy: Implications for motivation theory and practice" In L.W. Porter, G.A. Bigley and R.M. Steers (eds.), Motivation and work behavior. Boston: McGraw-Hill.

Sternberg R.J., & Williams W.M., (2001). Educational psychology. Boston, USA: Allynand Bacon.

Sweeney, J. C., & Ingram, D. (2001). A comparison of traditional and web--based tutorials in marketing education: An exploratory study. *Journal of Marketing Education, 23(1), 55-62.*

Tax, S.S., Brown, S.W. and Chandrashekaran, M. (1998), Customer evaluation of service complaint experiences: implications for relationship marketing*, Journal of Marketing, Vol.62, 60-76.*

Valerie, F. (2012). Re-discovering the PLS approach in management science. *Management, 15(1),* 101-123.

Walberg, H.J. (1981). A psychological theory of education productivity. In Farley, F.H. &Gordons, N. (Eds.), Psychology and Education (81-110). Chicago: National Society for the Study of Education.

Wanekezi A.U., & Iruloh B.R., (2012). Assessing Learning Environment for Achieving Standard in Primary Education: Implication for Counseling for Human Capacity Development. An International Multidisciplinary J. 6(2):274-289.

Wilson, B., Henselerm J., (2007). Modeling Reflective Higher Order Constructs Using Three Approaches with PLS Path Modeling: A Monte Carlo Comparison. Australian and New Zealand Marketing Academy Conference, Otago, Australia, 791-800.

Winberg, T. M., and Hedman, L. (2008). Student attitudes toward learning, level of pre-knowledge and instruction type in a computer-simulation: effects on flow experiences and perceived learning outcomes. *Instructional Science, 36*(4), 269- 287.

Woolfolk A.E., (2004). Educational psychology.9th ed. Boston: Pearson Education, Inc.

Wu, H., Tennyson, R.D., & Hsia, T. (2010). A study of student satisfaction in a blended e-learning system environment. *Computers and Education, 55, 155- 164*.

Zainudin Awang (2007). The influence of service quality andcorporate image on students loyalty in higher education: the case study of a local university. Doctoral of Philosophy. Universiti Malaysia Terengganu.

Zandvliet, D. B., & Fraser, B. J. (2005). Physical and psychosocial environments associated with networked classrooms. *Learning Environments Research, 8, 1–17.*

Zandvliet, D. B., & Straker, L. M. (2001). Physical and psychosocial aspect of learning environment in the information technology rich classrooms. *Ergonomics, 44*(9), 838-851.

Zandvliet, D.B. (1999). The physical and psychosocial environment associated with classroom using new information technologies: A cross-national study. Unpublished PhD thesis. Curtain University of Technology.

Examining Video Self-reflection for Teaching Practice

Jasmine Jain*

[1]*School of Education, Taylor's University.*
Lakeside Campus, No.1, Jalan Taylor's,
47500 Subang Jaya, Selangor, Malaysia.
Jasminejain.soed@gmail.com
**Corresponding Author*

Received Date : 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

There have been numerous studies looking at the use of video in recording teaching and subsequently for the video to be used for the teacher to view and reflect on. However, it was found that the framework to guide such practice for implementation is lacking and most model only resort to the traditional triad model of assessment in teaching practice. This paper acknowledge the need for pre-service teachers to be reflective in their practice and hence review the work done by other studies, specifically on the dimension of collaborative reflection, structures of reflection, length of video as well as the frequency of reflection. The review of the aforementioned dimensions subsequently led to a proposed model, namely the pentagonal model of assessment in teaching practice. With the proposed framework place in context, the discussion of how it can be implemented follows.

Keywords: *video, self-reflection, teaching practice*

INTRODUCTION

The practice of classroom observation or clinical supervision is a conventional and most popular way of assessing the competence of pre-service teachers in teaching. However, the extent in which it improves the practice of the pre-service teacher being observed is highly questionable. Of late, many researchers have argued against this method citing that it is hard

to capture the competence of the pre-service teaches due to the dynamic and unique nature of each classroom (Richards & Farrell, 2011), unless it is done in a regular manner. However, the frequent visits by an observer, which normally is the supervisor of the pre-service teacher, is not feasible due to logistic reasons (Welsch & Devlin, 2012). This paper explores the alternative design to such assessment, which focuses on pre-service teachers' professional development and how technology can be used as an enabler for such alternative framework for clinical supervision to happen.

BACKGROUND

Teaching practice is a form of work-integrated practice where pre-service teachers are placed in a work environment, namely schools as teacher for them to be able to relate theory into practice (Kiggundu & Nayimuli, 2009). The current teacher education which the author is based in is undergoing a revision of structure to the teaching practice, and the author is intrigued to look for a framework to guide the assessment of teaching practice, not just for the sake of grading the pre-service teachers, but also serve as a guiding framework which allow the pre-service teachers to be reflective in their practice, and enhance their professional development as they are prepared to be future teachers. In the existing framework for supervision, it follows the traditional trait model where the pre service teacher will be evaluated by only the supervisor from the university and mentor who is the experienced teacher in school.

The intention of preparing reflective teachers in teaching is consistent with the learning outcomes for the module Theory into Practice, which is a module on teaching practice in the university where the author is affiliated with. In this module, pre-service teachers are placed in host schools for three months and are given the opportunity to learn from experienced teachers and develop practical skills, particularly in the areas of planning, teaching, classroom management, and the organization of learning activities for pupils. The learning outcomes of the module are:

1. Plan theory-informed lessons to promote and support student learning consistent with the requirements of the curriculum

2. Develop theory-informed practice to promote and support student learning in own practice and in assisting teachers

3. Develop the capacities for reflective thinking for professional growth and development.

The author understand that having a supervisor for visitation is not apt enough to mold a teacher who is reflective in practice, as the visits which are typical once or twice are not regular enough to be involved in important decisions which the pre-service teachers make in developing pedagogical skills (Veal & Rikard, 1998). As the pre-service teachers' teaching experience has been noted as one of the most important and influential factors in preparing them to be beginning teachers (Clark, Smith, Newby, & Cook, 1985; Koehler, 1988; Lemma, 1993), there is a need to look deeper at an alternative of how teaching practice can be approached with regard to assessing the pre-service teachers.

Reflection in Teaching Practice: Theoretical Framework

There are many definitions of reflection but in teaching, reflection can be defined as an "active, persistent, and careful consideration of belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it ends" (Dewey, 1933, p.9). The definition in the recent century does not deviate much from what Dewey has defined in 1933 where Norton (1994) encapsulates reflection as "the capacity of a teacher to think creatively, imaginatively and critically about classroom practice. Teacher's ability to reflect critically on their teaching has been touted as a critical aspect for teacher professional development (Schön, 1983) as such ability is presumed to make them more effective as teachers (Black, 2001).

Pre-service teachers bring with them their prior experiences revolving on how they were taught and their lens of the ideal way of teaching, which influence the way they carry out assessment, view learning and children (Howard, 2003). From the constructivist view on learning, these schemes build upon their educational experiences can become deeply ingrained schemas which are difficult to alter (Piaget & Inhelder, 1972). With in-depth reflective thinking during teaching practice, it is claimed that newly

practicing teacher are able to accommodate and assimilate new information, serving to refine pedagogical thinking (van Driel, Beijaard & Verloop, 2001). Many researches has then been conducted and the positive outcomes of using reflection in teaching practice promoted reform-based beliefs that reflection has the potential to interpret and resolve dilemmas occurring in their own classrooms (Korthagen, 2001; Loughran, 2002).

Video for Self-reflection

The advancement of mobile phones in capturing video and the availability of camera to common people allow many researchers and practitioners alike to explore the usage of video by self-recording their teaching and reflecting on their teaching. Given the various benefits of including reflection in teaching practice, many research papers have indicated that using video is an effective way to encourage reflective practice among pre-service teachers (Bryan & Recesso, 2006; Dawson, Dawson & Forness, 2001; Tripp, 2011; Miller, 2009). A work worth highlighting is by Martin-Reynolds (1980) who reported that the comparison of pre and post test scores in their study indicated that their participants' responses shifted from themselves to their learners after participating in the video reflection activities. Despite the fact that video has been claimed as a means of encouraging teacher reflection for decades, research reporting teacher experiences self-reflection using videos are only recently making a headway in the teacher education literature (Tripp, 2011).

A few dimensions on using video as self-reflection will be discussed and considered in the following sections. The dimensions are:

1. Collaborative reflections
2. Structures of reflections
3. Frequency of reflections
4. Length of videos for reflections

Reviewing the few dimensions done by other researchers will inform the author better on the framework of using video in the current context of teaching practice used in the university she is affiliated with.

Collaborative Reflections

In the work by Miller & Carney (2008), as well as by Wright (2008), it was found that reflection using video is more in-depth compared to reflection that is done based on the teacher's memory after the teaching. The participants in their study were asked to record their teaching, and upon finished teaching, the teachers were asked to complete written reflections. The participants indicated that they are able to recognize few things that they did now when they reflected from memory, such as teacher-student interactions which they are able to perceive at slower pace (Miller & Carney, 2008). This shows that viewing video of their teaching is able to place them in the shoes of their students and provide them with the strengths and weakness of their lessons. However, there are studies that promote collaborative reflection than individual reflection as it was found that teachers appreciate discussing and having input about their performance in teaching from their friends than to just reflecting based on how they valued their own teaching (Halter, 2006; Welsch & Delvin, 2004). Their friends were able to see the mistakes which they failed to spot when they are reflecting themselves, resulting in a more rigor and in-depth reflection about their practice (Tripp, 2011). Other than that, having their peers to view and discuss about the videos allowed them to know that their peer also have the same struggles, providing them a sense of belonging to the teaching group.

Brawdy and Byra (1994) also suggested that supervisor could be a suitable person to discuss the video with, as they found that the improvement rate for the teachers who discuss their videos with their supervisor was higher compared to those who reflected on their video in solitary. For example, teachers felt that video-based discussion with their supervisor is more useful than evaluations without video feedback because video becomes a frame for reference which the discussion is based (Wang & Hartley, 2003). Overall, the self-evaluation done with the input of peers, colleagues or supervisors are more beneficial than done alone.

Structures of Reflection

The literature about the structure of reflection while viewing video is rather inconclusive (Tripp, 2011). There are two views which are prevalent in the literature, which suggest that a guiding framework on reflections

should be provided to the teachers, or none at all which would allow teacher to reflect on any areas of concerned to him or her.

Prior studies in the literature indicated that providing teachers with a guiding framework for their reflection provide the teachers a lens to look at the different aspects of their teaching clearly (Zeichner & Tabachnick, 1991). They were able to look at their lesson in different phases and are more informed at how they can improve their teaching in the future. There are studies too which compared the quality of reflection with and without a guiding framework and found that the quality of reflection by the teachers are significantly enhanced when they have a guiding framework to work with (Fox, Brantley-Dias & Calandra, 2007). This is because the questions in guiding reflection allowed focus and resulted in more in-depth reflections by addressing questions asked of them.

On a flipped side, Calandra, Gurvitch & Lund (2008) showed that providing guided structure to the teachers made their reflection too focused, resulting in a lack of flexibility to reflect on aspects beyond what was provided in the guiding framework for reflection. In their study, it was found that teachers were able to focus more on the technical aspects of their teaching and less on the conceptual understanding of their students when no guiding framework is given for their reflection. A study by Nicol and Crespo (2004) corroborated this findings as they reported that the participants of their study valued freedom to choose their own reflection focus rather than adhering on what needs to be focused on by the guiding framework. This review of literature suggests that teachers should be allowed to select their own focus of reflection, and then get their supervisor to review to help them narrow their focus for a more quality reflection process.

Frequency of Reflections

Most research looking at reflection in teaching did not measure the number of reflections needed to be done on one video which they have recorded, while other studies quoted that they asked teachers to reflect on a video one to three times, where three times being the most common. Although the number given were not justified, Tripp and Rich [as cited in Tripp, 2011] reported that teachers reached the “saturation effect”, which means they feel that their performance in teaching is good enough after

focusing on the same video three to four times. On the other hand, Storeygard and Fox (1995) indicated that the frequency of reflection should not be a determinant variable, but the time of which the reflection is happening is more important. The participants in their study mentioned that it is more valuable to reflect on the video before and after a conference with a peer or a supervisor (Storeygard & Fox (1995). While the minimum threshold for reflection on a video was not reported in any study which looked at video self-reflection, this suggests that three times is a good number to begin with.

Length of Video for Reflections

The length of video for reflections are lacking as there are no studies conducted to purposefully study this variable for quality reflection. Looking at the length of videos in past studies, it was found that he length of videos varied from a 3-minute clip of lesson to an entire teaching session of a teacher. However, there are data reported in a study that the participants felt that they could have reflected with more depth when the length of videos exceed three minutes so that they are able to get more content and context to reflect on (Sharpe et al., 2003). However, Pailliotet (1995) indicated that viewing the entire teaching session could be quite taxing, resulting in shallow reflection which is rushed to be finished.

Although video is increasingly used for reflection in the betterment of quality in teacher education, there is no framework available (Tripp, 2011) for those who wish to use video to design a video self-reflection for teaching practice.

The Proposed Pentagonal Framework

Given the review of literature and the purpose statement in the previous sections, this paper presents a framework of how the teaching practice using video reflection can take place. The elements of collaborative reflection, coupled with the structure and the length of video as well as the frequency of reflections are being considered and embedded in the framework.

As opposed to the traditional triad model, the proposed pentagonal model include more angles to the discourse of feedback and feed forward, which believed are helpful for pre-service teachers in understanding where

they stand in their current performance. Leveraging on the use of video recording, the proposed framework include two additional angles of peer and self-evaluations. Although the pre-service teacher and self-evaluation is represented by the same person, this framework advocates the theory of self-regulation and metacognition, and recognize that viewing the video of teaching offers a third-party observation, but with the understanding of what motivates any actions made during the teaching (Muraven & Baumeister, 2000).

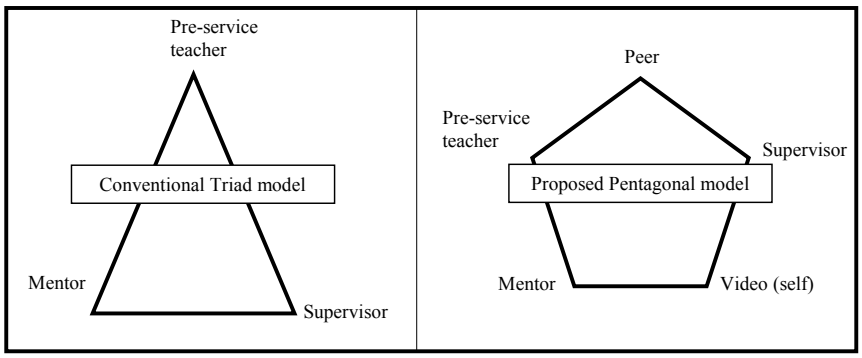


Figure 1: Pentagonal Models

The Structure of Assessment for The Pentagonal Model

The current placement structure requires pre-service teachers to be in school for three months, where they will spend their first week on orientation activities, such as observation of lessons, acquainting themselves with the school systems, curriculum, pupils as well as their mentor. Week two and three is on assistantship, where they immerse in the classroom activities with increasing degree of presence through means such as assisting to prepare class materials, marking student work, teaching small group of pupils and so on. With more confidence as they are placed in classroom and school, it is expected that they take up full duty teaching and gain more dominance in classroom lessons with the help and guidance of their mentor teacher.

The inclusion of video here is to support this model, by getting the pre-service teachers to record parts of their classroom teaching. The parts of lesson to be recorded are based on the three-phase lesson of effective

instruction (Curriculum Planning and Development Division, 2012), namely Readiness, Engagement and Mastery (REM). The three phases are described as follow:

1. Readiness: In this readiness phase of learning, teacher prepares pupils so that they are ready to learn. This requires consideration of prior knowledge, motivating contexts and learning environment.

2. Engagement: This is the main part of learning where teacher use a repertoire of pedagogies to engage students in learning new concepts and skills.

3. Mastery: this is the last phase of learning where teachers help students consolidate and extend their learning.
(Curriculum Planning and Development Division, 2012)

The context of REM components are placed as a reference so that the pre-service teachers record lesson which is long enough for them to based their reflection on, and able to re-record only the part which they can improve further on. The recording should not be less than 3 minutes, or more than 20 minutes for the reflection to be meaningfully take place, as suggested by the literature (Sharpe et al., 2003).

The entire process involve a pre-observation conference where the student teacher will discuss with their mentor on the lesson plan, and if necessary, suggest modifications or supplementary materials that can be included. The main purpose is to help the pre service teacher prepare and plan lesson that is to be taught. Then, when the lesson plan is executed, the lesson should be recorded in three parts- readiness, engagement and mastery. The post-observation conference can take place with the mentor as soon as after the lesson, or preferably done on the same day. The feedback conference between the mentor and pre-service teacher should examine those aspects of teaching that has been jointly agreed upon as observational focus during the pre-observation conference.

With the lesson recorded, three angles of feedback can then be sought after from peers, supervisor and self. The inquiry should be guided, especially in the collaborative reflections with peers and in self-reflection.

The focus of the analysis should be on student learning – and the ways in which the teaching facilitated or impeded that learning. For self-reflection, it is advocated that a guided framework for reflection should be provided, and the Gibb's Reflection cycle is given to allow for deeper reflection in aiding the pre-service teachers to be more reflective in their practice (Appendix 1).

Data collected during lesson observations, when analyzed, will show the student teacher's strengths as well as the areas that need improvement. Repeated observations are expected to provide a sound, cumulative description of the student teacher's teaching development over time, and serve as a progressive record of teaching for the pre-service teacher.

CONCLUSION

Although the use of video is something new planned to be implemented, the practice of being reflective is not. This paper is written to view how video can be integrated into the practice and at the same time, bring in another two angles of how teaching by the pre-service teachers can be viewed. A study on the effectiveness of using video in a pentagonal reflective model is viewed as a worthy endeavor to ensure that the learning outcomes of teaching practice, particularly in this context are achieved.

REFERENCES

Bryan, L. A. & Recesso, A. (2006). Promoting reflection with a web-based video analysis tool. *Journal of Computing in Teacher Education, 23*, 1, 31–39.

Clark, D. C., Smith, R. B., Newby, T. J., & Cook, V. A. (1985). Origins of teaching behaviors. *Journal of Teacher Education, 36*(6), 49–54.

Curriculum Planning and Development Division. (2012). *Mathematics Syllabus Primary One to Five*. Singapore: Ministry of Education.

Dawson, P. J., Dawson, K. E. & Forness, S. R. (2001). Effect of video feedback on teacher behavior. *Journal of Educational Research, 68*(5), 197–201.

Fox, D. L., Brantley-Dias, L. & Calandra, B. (2007, November). *Promoting preservice teachers' reflective practice through digital video and critical incident analysis in secondary English education*. Paper presented at the 57th National Reading Conference, Austin, TX.

Halter, C. P. (2006). The reflective lens: the effects of video analysis on preservice teacher development. *Dissertation Abstracts International, 67*, 3. (UMI No. 3211280).

Howard, T. C. (2003). Culturally relevant pedagogy: ingredients for critical teacher reflection. *Theory into Practice, 42*(3),195-202.

Koehler, V. R. (1988). Barriers to effective supervision of student teaching: A field study. *Journal of Teacher Education, 39*(2), 28–34.

Korthagen, F. (2001). *Linking practice and theory: The pedagogy of realistic teacher education*. Mahwah, NJ: Lawrence Erlbaum.

Lemma, P. (1993).The cooperating teacher as supervisor: A case study. *Journal of Curriculum and Supervision, 8,* 329–342.

Loughran, J. J. (2002). Effective reflective practice: In search of meaning in learning about teaching. *Journal of Teacher Education, 53*,33-43.

Martin-Reynolds, J. (1980). The effects of a self-evaluation model on the focus reaction of student-teachers during split-screen video-tape feedback. *Journal of Educational Research, 73*, 6, 360–364.

Miller, M. & Carney, J. (2008). Using video annotation software to enhance the mentoring and professional development of teacher candidates, *Journal for Research, Leadership, and Practice, 2*, 16–32.

Miller, M. J. (2009). Talking about our troubles: using video-based dialogue to build preservice teachers' professional knowledge. *The Teacher Educator, 44*(3), 143–163.

Muraven, M. & Baumeister, R.(2000). *Self-Regulation and Depletion of Limited Resources: Does Self-Control Resemble a Muscle?*. American Psychological Association. doi:10.1037/0033-2909.126.2.24.

Pailliotet, A.W. (1995). I never saw that before: a deeper view of video analysis in teacher education. *Teacher Educator, 31*(2), 138–156.

Piaget, J. & Inhelder, B. (1972). *The psychology of the child.* London: Basic Books. ISBN-13: 978-0465095001.

Richards, J. & Farrell, T. (2011). *Practice teaching: a reflective approach*. New York: Cambridge University Press.

Schon, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books, Inc.

Sharpe, L., Hu, C., Crawford, L., Gopinathan, S., Khine, M. S.,Moo, S. N. et al. (2003). Enhancing multipoint desktop video conferencing (MDVC) with lesson video clips: recent developments in pre-service teaching practice in Singapore. *Teaching and Teacher Education, 19*, 529–541.

Tripp, T. & Rich, P. (2011). Using video to analyze one's own teaching. *British Journal of Educational Technology*. doi: 10.1111/j.1467-8535.2011.01234.x

Van Driel, J. H., Beijaard, D., & Verloop, N. (2001). Professional development and reform in science education: The role of teacher's practical knowledge. *Journal of Research in Science Teaching, 38*(2), 137-158.

Veal, M., & Rikard, L. (1998). Cooperating teachers' perspectives on the students teaching triad. *Journal of Teacher Education, 49*(2), 109–119.

Wang, J. & Hartley, K. (2003). Video technology as a support for teacher education reform. *Journal of Technology and Teacher Education, 11*(1), 105–138.

Welsch, R. G. & Devlin, P. A. (2004). Developing preservice teachers' reflection: Examining the use of video. *Action in Teacher Education, 12*(4) 491–509.

Wright, G. A. (2008). *How does video analysis impact teacher reflection-for-action?* Unpublished doctoral dissertation.

Zeichner, K. & Tabachnick, B. R. (1991). Reflections on reflective thinking. In Tabachnick, B. & Zeichner, K. (Eds), *Issues and practices in inquiry-oriented teacher education* (pp. 1–21). Bristol, PA: The Falmer Press.

Factors Affecting Students' Utilization of Learning Management System: A Case Study

Nor Hapiza Mohd Ariffin[1], Saliza Ramly[2]

[1]*Faculty of Computer and Mathematical Sciences,*
Universiti Teknologi MARA,
40450 Shah Alam, Selangor Malaysia
hapiza@tmsk.uitm.edu.my
[2]*Faculty of Computer and Mathematical Sciences,*
Universiti Teknologi MARA, Negeri Sembilan
Kampus Seremban,Persiaran Seremban 3/1,
70300 Seremban, Negeri Sembilan,
Malaysia sallyza@ns.uitm.edu.my

Received Date : 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

The advent of e-learning technology has recently made the teaching and learning feasible on the Internet. E-learning is essentially any form of education that is facilitated by the Internet and its technologies used the World Wide Web to support instruction and to deliver course content. The purpose of this paper was to identify the students' utilisation of Learning Management System (LMS) namely, i-Learn at University Teknologi MARA (UiTM). The research examines four factors affecting the utilization of LMS which are technology competency, accessibility of i-Learn, lecturers' initiative and students perceive usefulness toward the utilization of i-Learn. The research employed the quantitative methodology. The respondents are the final year student of computing department at Faculty of Computer and Mathematical Sciences. Findings revealed that the level of utilization of i- Learn features is acceptable where score (Mean=2.94). Thus, the highest mean refers to technology competency (Mean = 3.16) followed by lecturers' initiative (Mean = 3.10), students' access to i-Learn (Mean = 3.00) and the lowest is students perceive usefulness toward utilization of i-Learn (Mean = 2.89). This studies also showed the correlation between factors affecting the utilization of i-Learn with theutilizationofi-Learnfeatures. Four hypotheses were analysed and tested where three were accepted and

one was rejected. The result showed that ”equationeditor”and develop content within i-Learnare preferred as an additional tool, contributed as the highest mean (Mean = 3.05) and (Mean = 3.04) respectively. Finally, recommendations for future improvements of LMS were also discussed. In line with the current educational situation, this study findings can be guidelines for other universities that practiced web-based learning to improve the existing learning managementsystem.

Keywords: *Learning Management System; blended learning; students, utilization*

INTRODUCTION

Technology enables people to have seamlessly interaction with others regardless of time and space. Internet has become a great medium used as online system in current education environment. For instance, Learning Management System (LMS) allows educators and students to utilize instructional materials, make class announcements, submit and return course assignments and provide greater communication between students within a class and the educators through multi-modal methods of communication.

A LMS is a software application or a web-based technology, enabling the management and delivery of content and resources to students. Typically, learning management system to provide educators with ways to create and deliver content, monitor the participation of students, and evaluate performance. LMS can also provide students with the ability to use interactive features such as a long discussion, video conferencing, and discussion forums. In addition, it facilitates administration, documentation, tracking and reporting programs and events.

LMS is the web that are including the courses that containing electronic tools consistinga discussion board, files, electronic mail, assessment, tutorial, e-learning program, quizzes, announcement, drawer, groups discussion and assignment project (Beer & Jones, 2009; Patricio et al., 2017).The benefitsoftheLMSisintrinsicallylinkedtothebusinesscasefore-learning. Travelingcost are saving, time are spent to learn will be reduced and more immediate response to learning needs all required the learning portfolio of an organisation to include-learning material (Howard,2003).

Brown and Johnson (2007) concluded that there are five benefits of LMS features which are centralized learning environment to ensure consistency, tracking and reporting for enhanced performance, immediate capabilities evaluation, continuous product and service proficiency for employees who interact with customers and clients, and regulatory and legal compliance. They added that LMS makes all types of training content, developmental content, and performance content available to individuals24/7 from any location with web access. Multiple users can access the LMS at any given point in time.

As institutions increase the number of online course offerings, more faculties will need to learn to teach using an LMS. Therefore, understanding the potential benefits of adopting an LMS is relevant to institutions. A perceived benefit of using an LMS is the ability to instruct online using a variety of modalities to meet learners' diverse needs (Mullinix & McCurry, 2003; Ahmed Younis Alsabawy et al., 2016). A challenge for instructors is providing differentiated instruction. An LMS permits faculty to incorporate multimedia elements including audio recordings, music, video, text, interactivity, and sequencing (Klemm, 1998).

Research done by Dabbagh (2004) said that the under utilization of LMSs, by both instructors and learners, results in a lack of robustness to offer extensive support for learning. Jones et. al (1995) suggest learning efficacy could be enhanced by improving learner awareness of metacognitive knowledge.

There is many research related to the factors to the success utilisation of Learning Management System. Volery & Lord (2000) stated that, the demand for e-learning course is increasing. The need for identifying factors is important to ensure the usage among students. Effective implementation of an e-learning initiative requires many factors including technological, pedagogical, and individual factors. However, the lack of theoretical or conceptual frameworks in many past studies dealing with the effectiveness of e-learning system resulted in inconsistent results and therefore more studies need to continuously done.

Hence, this research study will examine students' utilization of Learning Management System (LMS) portal as a tool to support their

learning needs. Inaddition, this research will focus on the critical elements that must be considered when assessing a LMS. The need for assessment is important from time to time to ensure a successful delivery of LMS and to address the under-utilization problems that the current LMS is facing.

BACKGROUND OF STUDY

University Teknologi Mara (UiTM) has developed Learning Management System as a non line learning platform for the students to learn and interact among themselves and instructors. This LMS, known as i-Learn is refers to learning management system for e-learning in UiTM. i-Learn Centre, together with the UiTM Academic Affairs Division, are stirring towards the Blended Learning by introducing its concept to UiTM students and lecturers in 2011.The project involves lecturers and students both at the main campus and branch campuses.

Relevant to recent technological advancement, i-Learn system acts as a platform that supports the teaching and learning process in UiTM for full time students. i-Learn allows instructors to update or upload any learning materials regarding the course. The class can be accessed any where and anytime via Internet. Under this program, students are expected to study independently but are required to attend the physical classes for lecture session.

THEORETICAL FRAMEWORK

The theoretical framework of the research involved four main independent variables as refer to NorHapiza (2014). These 4 independent variables are (1) Students' technology competencies, (2) Students' access to i-Learn, (3) Lecturers' initiative, and (4) Students' perceived usefulness towards i- Learn. The dependent variable was the student level of utilization the i-Learn.

Figure 1 elaborates the interconnection of these variables in the development of the theoretical framework. This research study was conducted to determine the utilization of i-Learn LMS by UiTM student. There are four possible factors that may influence the level of utilization of i-Learn.

Therefore, these are the factors that will be observed for the research purposes and their level of influence towards the subject matter would be determined. Each component was measured. A statistical analysis would be conducted to examine the level of students' utilization of i-Learn.

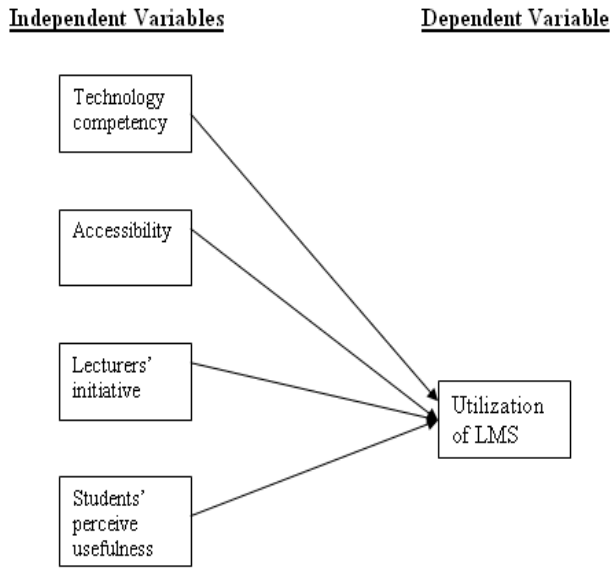


Figure 1: The Theoretical Framework

The aim of the study is to define the factors of affecting the utilizationofi-Learnfeatures. Below are the details of the objectives:

1. To identify i-Learn features most utilized by student and the level of utilization of i-Learn features.

2. To determine which factors affecting the student utilization ofi-Learn.

3. To analyze the relationship between factors affecting the utilization of i-Learn with student utilization of i-Learnfeatures.

4. To propose the additional tools needed to enhance the use ofi-Learn.

Therefore, the research methodology was formulated to address each of the following primary objectives to determine the factors affecting the use of i-Learn features. Based on the theoretical framework, these hypotheses were also developed:

H1: *If technology competency is higher, then student utilization of i-Learn features will improve*. H2: *If student access to i-Learn is higher, then student utilization to i-Learn features will improve.* H3: *If lecturers' initiative is higher, then student utilization to i-Learn features will improve.*
H4: *If students perceive usefulness is higher, then student utilization to i-Learn features will improve.*

RESEARCH METHODOLOGY

This research studied learning management system that was adopted by Malaysian universities that offeredundergraduatefulltimeprograms. Thesubjectsofthisresearchwerefinalyearstudentsenrolled in Computing department at Faculty of Computer and Mathematical Sciences in UiTM ShahAlam.

The instrument used in this research is Survey of Utilization of i-Learn among UiTM students survey instrument. This instrument was designed to measure the levels of utilization among the students. This instrument was adapted from Ahmad Fauzi et al. (2010).

Firstly, the researcher conducts pilot test and the overall reliability is 0.91. As mentioned by Dancy and Reidy (2002), the Cronbach Alpha values that were above 0.70 is considered a good reliability, therefore, this research instrument could be considered as having good reliability. After the validation and verification, then the questionnaire was distributed to the respondents.

The research study is carried out on a stratified sampling method whereby the respondents are obtained from each stratum. The aim is to obtain a sample that is representative of the population to increase the efficiency and to decrease the error in the estimation (Powell, 1998).

Approximately, 200 sets of questionnaires were distributed via online to the respondents' email. 106 of questionnaires distributed were returned. The responses were measured by using Likert scale. Likert scale is a measurement scale that has a four-response category ranging from "strongly disagree" to "strongly agree", which requires the respondents to indicate the degree of agreement or disagreement to each series of statements in the questionnaire.

DEMOGRAPHIC PROFILES

The summary of the general demographic profile of the 106 respondents used for this survey is 71.7% of the respondents are female and 28.3% are male.

Most of the respondent have computer (96.2%) and the remainder did not own computer (3.8%). The survey shows that 87.7% of them have access to the Internet at home, while 12.3%cannot access Internet at home. Furthermore, the survey shows that 91.5% respondents used i-Learn for learning and 8.5% respondents did not used i-Learn forlearning.

Most of the respondents aged between 19 – 22 years old (94.6%). The next age group, with a percentage()5.4%,isthoseagedbetween23–25yearsold. Therearenorespondentsthatagedabove25 yearsold.

FINDINGS

Firstly, this section describes the findings of the main specific questions pertaining to the assessment of features of i-Learn. This section is divided into three-sub sections which are:

1. Communication features

2. Group and Collaborative features and (iii) Assessment and Assignment features.

The overall mean score for *communication features* was 2.84, and the standard deviation was 0.7. Items related to course documents and content

has the highest mean (M=3.21, SD=0.643). While the lowest mean is, item related to chat (M=2.50, SD=0.796). Detailed information on five items is shown in Table 1.

Table 1: Students' Utilization of Communication Features

Attributes	Mean (M)	Standard Deviation (SD)
1) Discussion Board/Forum	2.59	0.766
2) Chat (asynchronous)	2.50	0.796
3) Announcements	3.07	0.606
4) Course Documents and content	3.21	0.643
5) E-mail	2.82	0.687
Overall Mean	**2.84**	**0.7**

The overall mean score for group and collaborative features was 2.79, and the standard deviation was 0.779. Items related to feed back among peers have the highest mean (M=2.80, SD=0.749). While the lowest mean item is related to work in-group online (M=2.77, SD=0.808). Detailed information on all items was shown in Table 2.

Table 2: Students' Utilization of Group and Collaboration Features

Attributes	Mean (M)	Standard Deviation (SD)
1) Ability to work in groups online	2.77	0.808
2) Offer group feedback among peers	2.80	0.749
Overall Mean	**2.79**	**0.779**

The overall mean score for assessment and assignment features was 3.2, and the standard deviation was 0.717. Items related to online quiz have the highest mean (M=3.40, SD=0.643). While the lowest mean item is related to i-monitoring (M=3.04,SD=0.755). Detailed information on all items was shown in Table3.

Table 3: Students' Utilization of Assessment and Assignment Features

Attributes	Mean (M)	Standard Deviation (SD)
1) Online Quiz	3.40	0.643
2) Assignment submission	3.15	0.753
3) Checking progress (i-Monitoring)	3.04	0.755
Overall Mean	**3.2**	**0.717**

A further analysis of the results of the students' utilization of i-Learn was done by using a detailed assessment weighted scoring. Each criterion is given a score based on the metrics specified by Genove and Mercoda (2010). From the results, an overall score of **2.94** was given to the utilization of i-Learn features which has a quantitative interpretation of acceptable. The utilization of i-Learn features was given a rating of acceptable rating in which scores ranging from 2.5 to 2.99 was given.

Findings illustrate that students scored a very good level for the component of students' utilization of assessment and assignment features. In contrary, Group and Collaborative features, and Communication features was at the level of acceptable respectively. The lowest score is group and collaborative features which value is 2.79. The scoring range for students' utilization of i-Learn features is illustrated in Table 4.

Table 4: Level of Students' Utilization of i-Learn Features

Features	Range of Score	Score	Levels of Utilization
Communication	2.50 to 2.99	2.84	Acceptable
Group and Collaborative	2.50 to 2.99	2.79	Acceptable
Assessment and Assignment	3.00 to 3.49	3.2	Very Good
Overall	**2.50 to 2.99**	**2.94**	**Acceptable**

Furthermore, the analysis of percentage of respondents utilizes overall i-learn features showed that 30.8% of students' utilization of i-Learn features received an acceptable score. 23.7% of the students utilize the i-Learn features at poor score range. Likewise,23.4% of the respondent recorded at the very good level. However, only 6% of the respondents recorded at excellent score range. The results are shown in Table 5.

Table 5: Percentage of Respondent Utilize Overall i-Learn Features

Levels of Utilization	Score	Total Respondent	(%)
Unacceptable	1.0 to 1.99	17	16.1
Poor	2.0 to 2.49	25	23.7
Acceptable	2.50 to 2.99	33	30.8
Very Good	3.0 to 3.49	25	23.4
Excellent	3.50 to 4.0	6	6

Secondly, to determine which factors contribute to the utilization of i-Learn, four possible factors that might influence the level of utilization of i-Learn have been tested using descriptive statistical analysis.

Students' technology competency is an important factor to be studied which related to independent variable *Technology Competency* in the theoretical framework. From the results, the overall mean for the students' technology competency is **3.16.** Meanwhile the standard deviationis 0.6. Items related to students' frequently use the Internet get the highest mean (M=3.45, SD=0.649). While the lowest mean item is related to students' feel confident about the Internet skill used where means is (M=2.95, SD=0.523). These results indicated that the respondents were technologically competentand efficient in the used of high computer technology since the mean score for students' technology competency was above3.0.

The survey also asked the respondents on *students' access to i-Learn* which related to independent variable *Accessibility* in the theoretical framework. From the results, the overall mean for the students' access to i-Learn is **3.0**. Meanwhile the standard deviation is 0.660. Items related to students' having Adobe Acrobat Reader on computer (M=3.19, SD=0.678) has the highest mean. While the lowest mean is, item related to question "My Internet speed is sufficient" (M=2.85,SD=0.673).

Based from the respondents' perception about *Lecturers' initiatives*, the highest mean was item related to lecturers always including important information in i-Learn (M=3.24, SD=0.626). Meanwhile item related to lecturer gives many activities in the forum was the lowest mean (M=2.88,SD=0.713).

From the results, the overall mean for lecturers' initiatives is **3.1**. Meanwhile the standard deviation is 0.626. *Students' perceive usefulness* of i-Learn is the fourth possible factors that may influence the level of utilization of i-Learn. Based from the survey, item students' feel that i-Learn is easy to use has the highest mean (M=3.18, SD=0.582). While the lowest mean is item related to student feeling bored when using i-Learn (M=2.29, SD=0.780). From the results, the mean for the students' access to i-Learn recorded overall mean was **2.89.** Whereas, the standard of deviation was0.641.

As a summary, the over all mean for studies factors shown in Table 6. This consists of the means factors utilization of i-learn. The highest means for the factors utilization of i-Learn is technology competency (M=3.15, SD=0.421). Obviously, this result indicates that many peoples nowadays use technology as a medium for any learning activities.

Table 6: The Factors Affecting the Utilization of i-Learn

Factors	Mean (M)	Standard Deviation (SD)
Technology Competency	3.15	0.421
Students' Access of i-learn	3.0	0.499
Lecturers' initiative	3.09	0.565
Students' Perceived Usefulness	2.89	0.386
Overall	**3.03**	**0.335**

Further analysis of studies shows the relationship between the four factors students utilization of i-Learn. Hence, four hypotheses is being tested using Pearson Correlation analysis. All data has been tested for normality using box plot before proceeding for Pearson correlation.The box plot revealed that the distribution was approximately normally distributed. Below is the discussion of details.

Hypothesis 1: *If student technology competency is higher, then student utilization of i-Learn features will improve.*

The relationship between technology competency with the utilization of i-Learn features isnot significant where $p > 0.05$. The Pearson correlation shows that the relationship between technology competency and utilization

of i-Learn was found to be positively and very weak related (r = 0.108). Thus, as technology competency rises, then students' utilization of i-Learn features will not improve. Therefore, this indicates that hypothesis 1 (H1) is not accepted. The result is shown in Table 7.

Hypothesis 2: *If student access to i-Learn is higher, then student utilization to i-Learn features is will improve.*

The relationship between success access to i-Learn with the utilization of i-Learn features is statistically significant where $p < 0.05$. The Pearson correlation shows that the relationship between accessibility of i-Learn and utilization of i-Learn was found to be positively and weakly related ($r = 0.225$).

Thus, as success access to i-Learn rises, then students' utilization of i-Learn features will improve. Therefore, this indicates that hypothesis 2 (H2) is accepted. The result is shown in Table 7.

Hypothesis 3: *If lecturers' initiative is higher, then students' utilization to i-Learn features will improve*.

The relationship between lecturers' initiative with the student utilization of i-Learn features is statistically significant where $p < 0.05$. The Pearson correlation shows that the relationship between lecturers' initiative and student utilization of i-Learn was found to be positively and weakly related ($r = 0.290$). Thus, as lecturers' initiative rises, then students' utilization of i-Learn features will improve. Therefore, this indicates that hypothesis 3 (H3) is accepted. The result is shown in Table 7.

Hypothesis No.4: *If students perceive usefulness is higher, then student utilization to i-Learn features will improve.*

The relationship between students perceive usefulness with the student utilization of i-Learn features is statistically significant where $p < 0.05$. The Pearson correlation shows that the relationship between students perceive usefulness and utilization of i-Learn was found to be positively and weakly related ($r = 0.381$. Thus, as students perceive usefulness rises, then students' utilization of i-Learn features will improve. Therefore, this indicates that

hypothesis 4 (H4) is accepted. Table 7 below shows the overall studied factors towards the students' utilization of i-Learn. The result shows that students perceived usefulness has the strongest relationship with students' utilization ofi-Learn.

Table 7: Correlation between the Studied Factors with Students' Utilization of i-Learn Features

Factors	Students' Utilization of i-Learn Features
Students' Technology Competency	0.108
Students' Access to i-Learn	0.225
Lecturers' Initiatives	0.290
Students' Perceived Usefulness	0.381

Further analyses were conducted to investigate the relationship between the four factors using the Pearson correlation test as in Table 8. All the variables were significant related, except the relationship between technology competency with lecturers' initiative is not significant because the value of p more than 0.05.

Table 8: Correlation between the Studied Factors

	Technology Competency	Access to i- Learn	Lecturers' Initiatives	Students' Perceived Usefulness
Technology Competency	1	.613**	.145	.248*
Access to i-Learn	.613**	1	.307**	.460**
Lecturers' Initiatives	.145	.307**	1	.334**
Students' Perceive Usefulness	.248*	.460**	.334**	1

Five items used for suggested of additional tools for i-learn. Based on the result survey, the highest of mean is (M=3.05, SD=0.749) for equation editor that able to type mathematical symbol and develop content i-Learn means also highest (M=3.04, SD=0.713. The lowest means is about real-time video communication (synchronous) with lecturer, (M=2.71, SD=0.896). The overall result can be seen in Table 9.

Table 9: Additional Tools for i-Learn

Attributes	Mean (M)	Standard Deviation (SD)
Receive important alert/messages from i-learn to hand phone.	2.95	0.818
Develop content within i-Learn (ex: collaborative, WEB 2.0 TOOLS, presentations, blogs, wiki)	3.04	0.713
Equation editor (able to type mathematics symbols)	3.05	0.749
Meet online with peers in class in chat room	2.82	0.855
Real-time video communication (synchronous) with lecturer	2.72	0.896
Overall	2.92	0.676

DISCUSSIONS

As a general summary, the study showed that the score indicated that the levels of students' utilization the i-Learn was acceptable which only 16.1% score indicate unacceptable. There is about 6% of the score indicates excellent level of utilizati on i-Learn but the percentage was still small. Meaning that there is still a lot of improvement should be taken into an action plan to ensure the excellent level of student utilization of i-Learn will be achieved. On the other hand, the result showed that all the features are important to ensure the quality and the success of LMS for learners to complete their learning process successfully in their studies. However, there are feature that was underutilize by students which is chat features. It has the lowest mean which is2.50.

Regarding the first objective, there are three main features in i-Learn, which include (1) communication features (2) group and collaborative (3) assessment and assignment. These features are basic features that LMS should have to support student in their study. All features received an acceptable score from the students. The feature that most utilize by students was assessment and assignment features.The mean was 3.2 and the score indicated that the level of students'utilization the feature was very good.

However, the Group and Collaborative features receive the lowest score rated by students with mean equal to 2.79. Hence, i-Learn implementation should apply more Group and Collaborative features in their system. Some of the features that i-Learn should add as collaboration features are discussion forums, chat, wikis, blog, journal, group community *etc*. as suggested by Kavi(2017).

Regarding the second objective of there search, to determine factors affecting the utilization of i-Learn features, the study shows that the highest mean was students technology competency which followed by lecturers' initiative, students'access to i-Learnand the lowest mean was students perceived usefulness. From the findings, it indicates that the students felt that a good level of technology competency is the motivating factor for them to utilize the i-Learn. This is supported in a study by Ahmad Fauzi etal. (2010) which stated that computer skills are an important factor in the technological environment.

This finding also revealed that student felt their lecturer plays an important role to initiate and motivate them to use i-Learn. Researcher concludes that students are dependent on lecturer to actively usethei-LearnLMS.This is inline with are search done by Fresen (2007) which identified that lecturer interaction with students as one of the factors in student utilization of web-based learning.

Regarding the student access to i-Learn that refers to the accessibility of the LMS system, researcher believes that network problem can affect the use of i-Learn features. Observation study from NorHapiza et. al (2014) revealed that network problem can create annoying when the students need to submit assignment or participating in discussion. As stated by the study, student who is frustrated with the network problem will felt bored to use LMS when this situation happens.

The lowest mean among all the factors studied was students perceived usefulness. People will perceive usefulness if they believe it will help them perform their task better. This indicates that if students believe that i-Learn LMS is useful, they will likely to enjoy the class. Study done by Gautreau (2011) reported that students'enjoyment is a critical factor for utilizing the online learning. Researcher assumed that this situation probably related to the lacking of students' time management andattitude.

Regarding the third objective, several analyses were conducted to see the relationship between the studied factors towards students' utilization of i-Learn features. The hypotheses testing was conducted and the result showed that 3 hypotheses are accepted and 1 rejected as shows in Table 10. This indicates that not all the factors contributed to the utilization of i-Learn.

Table 10: Correlation Between Factors Affecting the Utilization of i-Learn with Utilization of i-Learn Features

Hypotheses	P value	Result	R value
H1	0.269	Not significant, Positively, very weak	0.108
H2	0.008	Significant, Positively, weak	0.255
H3	0.003	Significant, Positively, weak	0.290
H4	0.000	Significant, Positively, weak	0.381

The result above showed that three hypotheses (H2, H3, H4) are significant and H1 is not significant therefore it was rejected. This finding is contrary with research done by NorHapiza et. Al (2014) which identified that Students' Technology Competency factor was correlate significantly with the utilization of LMS features.

Furthermore, the findings revealed that Student Perceived Usefulness has the highest mean among the correlation between the Studied Factors with Students' Utilization of i-Learn Features.This finding is supported () a research done by Jowathi (2014) that indicated perceived usefulness has a significant influence on attitude towards using the LMS.

Regarding the fourth objectives, this study revealed that the students felt it isimportant for them to have a good equation editor and a good content of e-learning materials to ensure the effectiveness of blended learning. Students also agreed that learning through a mobile is an added value because most of the students carry handphones. Important alert messages regarding the course can be sent directly to their mobile. For instance, when lecturer uploads material, students get the alert and can immediately login to i-Learn.The feedback from the survey also agreed that alert should be sent to their handphones or emails. Isshametal (2010) found that learning through mobile is convenient to the respondents since the SMS sent are brief and powerful.

Moreover, students agreed that online chatting (synchronous) should be added. Currently, the chatting features are being done using asynchronous communication. Hrastinski (2008) in his study stated that until recently e-learning mainly relied on asynchronous for teaching and learning. However, with the advance of current technology have led to growing popularity of synchronous communication.

Interestingly in his research, he found that if students seldom meet face-to-face with lecturer and only rely on asynchronous communication, it would result on student feel isolated and not part of the group. The drawback of using asynchronous chatting is that it could prolong over long times. It may takehours, days or even weeks for peers or lecturer stores pond. Nevertheless, asynchronous has several advantages. For instance, when synchronous meeting cannot be scheduled because of other commitment, asynchronous can be an advantage. Students can leave comment and check later for the feedback. Therefore, researcher suggested that synchronous and asynchronous communication for e- learning should be merged.

CONCLUSIONS

The adoption of a learning management system into learning practices is increasing in higher education (Anuwar, 2008). There is various form of Learning Management Systemeither self-developed by the university or outsource to vendor. The existence of LMS does not guarantee the success of students' utilization of the portal. LMS are often underutilized by students' (Mitropoulou et. al, 2007). Hence, this study was conducted to access the current LMS adopted byUiTM.

Based from the findings, this research is beneficial for University Technology Mara (UiTM) to enhance the current i-Learn system. It can contribute as a guideline for UiTM for attract more students' utilizing the i-Learn features. The research can also be used for other universities that practiced web-based learning to improve the existing learning managementsystem.

REFERENCES

Ahmad Fauzi, M., Rohani, A.T, Wan Marzuki, W.J, Wan Zah, W.A, and Wong, S.L. (2010). *Factors influencing students' use a Learning Management System Portal: Perspective from Higher Education*. International Journal Of Education And Information Technologies, Issue 2, Vol 4, pp. 101-108.

Ahmed Younis Alsabawy, AileenCater-Steel,JeffreySoar(2016). Determinants of perceived usefulness of e-learning systems. Computers in Human Behavior, Volume 64, 2016, Pages 843-858, ISSN0747 5632.

Anuwar, A. (2008). Issues & Challenges in Implementing e-learning in Malaysia. Open University Malaysia. http://library.oum.edu.my/repository/145/1/issues_and_challenges.pdf. Accessed 12 April 2017.

Beer, C., Jones, D., & Clark,K. (2009). The indicators project identifying effective learning: adoption, activity, grades and external factors. Paper presented at the ASCILITE 2009.

Brown, A., & Johnson, J. (2007). Five advantages of using learning management system. http:// www.microbustlearning.com. Accessed 08 January 2017.

Dabbagh, N. (2004). Pushing the envelope: Designing authentic learning activities using course management systems. In Proceedings of world conference on e-learning in corporate, government, healthcare, and higher education (pp. 1155–1159).

Dancey, C. P. & Reidy, J. (2002). Statistic Without Maths for Psychology Using SPSS for Windows. 2nd Edition Prentice Hall.

Fresen, J. (2007). A Taxonomy of factors to promote quality web-supported learning. International Journal on E-Learning, 6(3), 351-362.

Gautreau, C. (2011). Motivational Factors Affecting the Integration of a Learning Management System by Faculty. Journal of Educators Online., 8 (1) (2011), pp. 1-25.

Genove, G. P. C. & Mercado, C. A., (2010). Standard Based Requirements for LMS Profile Assessment. The Seventh International Conference on eLearning for Knowledge-Based Society. 16-17 December 2010, Thailand.

Hrastinski, S. (2008). Asynchronous & synchronous E-learning. A study of asynchronous & synchronous e- learning methods discovered that each supports different purposes. Educause Quarterly

Howard, C. (2003). Selecting Learning ManagementSystem.http://www.oktopusz.hu/domain9/files/modules/module15/22609EE42A8507B.pdf.

Issham Ismail, Thenmolli Gunasegaran, P.P. Koh & Rozhan M.Idrus(2010). Satisfaction of Distance Learners towards Mobile Learning in the Universiti Sains Malaysia School of Distance Education. Malaysian Journal of Educational Technology Vol 10, No2.

Jones, M. G., Farquhar, J. D.,&Surry,D.W. (1995). Using metacognitive theories to design user interfaces for computer-based learning. Educational Technology, 35, 12–22.

Jowati, J. (2014). Perceived Usefulness and Ease of Use of the Learning Management System as a Learning Tool. International Education Studies; Vol. 7, No. 8, pp. 23-34.

Kavi, J. (2017). Exciting Features of an LMS to Provide Learners a Collaborative Experience [Infographic].http://blog.commlabindia.com/training-solutions/lms-features-for-a-collaborative-learning-infographic. Accessed 14 April 2017.

Klemm, W. R. (1998). Eight ways to get students more engaged in online conferences. http://www.thejournal.com/magazine/vault/A1997.cfm. Accessed 10 February 2017.

Patricio E. Ramírez-Correa, F. Javier Rondan-Cataluña, Jorge Arenas-Gaitán, Jorge L. Alfaro-Perez (2017). Moderating effect of learning styles on a learning management system's success. Telematics and

Informatics, Volume 34, Issue1, February 2017, Pages272-286, ISSN0736-5853, https://doi.org/10.1016/j.tele.2016.04.006.

Mitropoulou, ,Y. Vovides, S. Sanchez-Alonso and G. Nickmans. (2007). The use of e-learning course management systems to support learning strategies and to improve self-regulated learning. Educational Research Review 2(1):64-74.

Mullinix, B. B., & McCurry, D. (2003). Balancing the learning equation: Exploring effective mixtures of technology, teaching, and learning. http://technologysource.org/article/balancing_the_learning_equation/. Accessed 12 March 2017.

NorHapiza, M. Noraziah, A. Hanin,A. and Janudin, S. (2014). Assessment of the students' utilization of a Learning Management System in a Malaysian higher education. IEEE Conferenceone-Learning, e-Management and e-Services (IC3e), Hawthorn, VIC, 2014, pp.18-23.

Volery, T. and Lord, D. (2000). Critical success factors in online education. International Journal of Educational Management, Vol. 14, pp.216 – 223

Online Language Games for Pre-Degree Students

[*]Anealka Aziz Hussin[1], Tuan Sarifah Aini Syed Ahmad[2], Eliyas S. Mohandas[3]

[1]Academy of Language Studies, 40450 Shah Alam, Selangor, Malaysia
anealka@salam.uitm.edu.my
[2]Academy of Language Studies, Universiti Teknologi MARA, Kuala Pilah Campus, Pekan Parit Tinggi, 72000 Kuala Pilah, Negeri Sembilan, Malaysia
tsyaini@ns.uitm.edu.my
[3]Academy of Language Studies, 40450 Shah Alam, Selangor, Malaysia
eliyas9154@salam.uitm.edu.my
**Corresponding Author*

Received Date : 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

Students like to play online games and some of them are found to be addicted to certain online games. However, when ask about playing educational games especially language games, the responses are not very encouraging. For many, language games are for juvenile, and not suitable for college level students like them. This study intends to show that language games are relevant even to college level students. Several online games were developed based on the learning outcomes of an undergraduate English language course. The games were designed at different difficulty levels based on the Bloom's Taxonomy. 34 pre-degree students (7 males and 27 females) from Universiti Teknologi MARA (UiTM) Negeri Sembilan participated in the study. They were asked to try the games and give feedback on what they think of the games. Results of the survey showed that the students were motivated to play the games, and they believed that they could improve their language skills by playing the games.

Keywords: *English, language games, pre-degree*

INTRODUCTION

Integrating online games in learning is crucial for today's university students who are categorised as digital natives. Since they have been exposed to computer games in their daily life, they expect that computer games are used in their learning (Epper, Derryberry, & Jackson, 2012). Chen (2014) claims that they have the built-in capability to use online technological tools. Furthermore, placing games on the Internet is suitable for them since they prefer the virtual world that can serve as the platform to provide guided and engaging teaching and learning experiences (Kee, Vaughan, & Graham, 2010).

However, the integration of games in learning has been challenging. Games have been seen as time fillers in English class and are played for fun (Yolageldili & Arikan, 2011)they do not use games as frequently as expected in their classrooms. (English;Khonmohammad, Gorjian, & Eskandari, 2014). Schifter (2013) states that teachers have the tendency to think that games are trivial and just as time fillers if games do not meet the need of the curriculum. Epper et al. (2012) assert that games become invaluable for learning when pedagogical rationale is not included, and the implementation of games in learning should consider the balance for academic excellence, program integrity, academic freedom, and student achievement. Hence, online games for instructional purposes need to be designed by taking into account the learning outcomes that students are required to achieve.

Therefore, the statement of problem of the study was games were not suitable for language learning. The purpose of the study was to determine that language games are relevant in language learning. The objectives of the study were (1) to develop language games based on Bloom's Taxonomy and (2) to obtain students' perception on the relevance of these games in language learning.

The study is significant to students and teachers. First, it enables them to practice their language skills autonomously. Second, they are more motivated to practice their language skills outside the classroom. Third, language learning becomes fun yet challenging. Fourth, teachers can customize games to meet the needs of their students. Finally, they become competitive in learning.

However, the study had several limitations. The first limitation was the types of games created were restricted to grammar items. The second limitation was that the sample size was small. Hence, the results were true for the selected sample, and they cannot be generalized to other students at different places and levels.

LITERATURE REVIEW

Online games are computer games that are played on the Internet by a single player or multiple players or by using a multiple input gadgets (Ellis, Heppell, Kirriemuir, Krotoski, & McFarlane, 2006). They are also known as digital games (Klopfer, Osterweil, & Salen, 2009; Boyle, Connolly, Hainey, & Boyle, 2012; Cornillie, Thorne, & Desmet, 2012). Online games for instructional purposes are called with several different names such as computer games (Smith, Li, Drobisz, Park, Kim & Smith, 2013), digital games (Schaaf, 2012), digital educational games (Lin & Lin, 2013), computer-based instructional games (Butler, 2014) , e-learning games (Fu, Su, & Yu, 2009), instructional games (Jafari, Madani, & Maghsoudi, 2013) and serious games (Anyaegbu, Ting, & Li, 2012).

Online games have specific features**.** According toButler (2014) and Klopfer, Osterweil, & Salen (2009), online games are organized plays. Klopfer et al. (2009) further explains that games incline to have (1) specific aims, (2) transparent and unbiased rules to ensure fairness to all players, (3) mostly have "win" states, and (5) success is clearly determined by marks or other measurable results. Juul (2003) defines games with six characteristics: (1) games have rules, (2) games have variables and measurable outcomes, (3) games have positive or negative values allocated to possible outcomes, (4) games are challenging that require players to put effort to gain the outcome, (5) games make players attach to the outcome as they will feel happy if they get positive outcomes or sad if they get negative outcomes, and (6) games are negotiable as the same game can be played with or without real-life effects. Garris, Ahlers, & Driskell (2002) also outline six instructional game characteristics, but with broad dimensions: (1) fantasy (imaginary context, themes or characters), (2) rules (clear rules goals and feedback), (3)sensory stimuli (dramatic visual and audio stimuli), (4) challenge (optimal difficulty level and uncertain goal achievement), (5) mystery (optimal informational complexity level), and (6) control (active student control).

Online games serve several roles in language learning. First, they are used to promote enjoyment in learning (Godwin-Jones, 2014; Ang, 2014), increase students' motivation (Khonmohammad, Gorjian, & Eskandari, 2014; Anyaegbu et al., 2012; Liu & Chu, 2010; Jalali & Dousti, 2012), enhance information retention (Taheri, 2014; Aghlara & Tamjid, 2011; Smith et al., 2013), improve engagement (Godwin-Jones, 2014; Schaaf, 2012), increase students' learning autonomy (Godwin-Jones, 2014), and permit interactivity (Sørensen & Meyer, 2007; Juzeleniene, Mikelioniene, Escudeiro, & Carvalho, 2014). Since the games are online, they share some of theroles of online learning activities such as they can be accessed 24/7, used outside of the class and cater with different learning styles (Parui & Nath, 2014).

In learning grammar, online games have other specific roles. According to (Garrett, 2009), learning grammar by using conventional drills is insufficient to explain grammar concepts and examples (,)followed by self assessment to evaluate comprehension. She asserts that Computer Assisted Language Learning (CALL) can replace conventional drills since grammar can be explained better by using animated computer graphics that permits dynamic illustrations of grammatical relations. Moreover, she adds that useful links of grammar database can be provided when grammar is learnt online. Studies proved that a lot of repetitive online practices made students felt that the activities were monotonous and tiresome (Thang et al., 2012; Jiang, 2012). Hence, online language games with multimedia features have the potential to serve the purposes described by Garrett (2009).

When online games are used for learning, they have to be able to measure the learning progress of students. Bellotti, Kapralos, Lee, Moreno-Ger, & Berta (2013) justify that online games for instructional purposes must have a testing tool which is acceptable in the educational context, and Bloom's Taxonomy is suitable to serve the purpose. However, their reviews on serious games suggest that serious games are only effective for motivating and attaining learning objectives at the lower levels in Bloom's Taxonomy. In contrast, O' Brien 2010) stresses that all levels in Bloom's Taxonomy are applicable in designing games of different levels for developing various cognitive skills. According to Gunter, Kenny, & Vick (2006), Bloom's Taxonomy has been used by teachers in developing learning objectives thus questions and lessons are designed according to this taxonomy. They state

that Bloom's Taxonomy is associated with mastery learning where students have to master the previous lesson in order to move on to the next lesson. Hence, they claim that the design of games can adopt the same concept.

Designing educational games may cause several setbacks such as additional cost may be required in using new software and it may also involve the additional programming language (Siko & Barbour, 2013). Hence, MS PowerPoint is one of the alternative tools for designing educational games that can address the setbacks. This is due to several reasons. First, it is a ubiquitous application used at learning institutions (Siko & Barbour, 2013). Consequently, additional cost is not incurred in purchasing new software and trainings. Second, it has still remained as the most prevalent application among educators compared to other alternatives such as Prezi, IMPRESS, Beamer and TurningPoint (Berk, 2011). Hence, educators are familiar with the software and trainings may not be required. Finally, it permits the use of multimedia such as coloured text, animated images and sound (Oommen, 2012), and it also offers advance features for instance movement, music, still images, and videos (Berk, 2011). As a result, interesting educational games can be created.

METHODOLOGY OF THE STUDY

The study was divided into two stages: (1) thegame development and (2) thesurvey.

Game Development

In this stage, a course was selected (a Part One English course for diploma programs) and one teaching point (Grammar: Nouns) was identified. Six levels of interactive games in learning Nouns were designed based on Bloom's Taxonomy. Bloom's Taxonomy emphasizes on cognitive domains which are arranged in the hierarchy from the lowest to the highest: knowledge, comprehension, application, analysis, synthesis and evaluation. Therefore the levels of difficulty of the games were arranged according to this hierarchy.

The following table indicates the storyboard comprising game objectives, game description and the levels according to Bloom's Taxonomy.

Table 1: Game Objectives, Game Description and the Levels According to Bloom's Taxonomy

Level	Game Objective	Game Description	Level according to Bloom's Taxonomy
1	To **identify** between countable and uncountable nouns	Student needs to catch birds that carry countable nouns or uncountable nouns (based on the sets given).	Knowledge
2	To **distinguish** the plural form for singular regular noun or singular irregular noun (based on the sets given)	Student needs to distinguish from the three options the correct plural form for singular regular noun or singular irregular noun.	Comprehension
3	(Set A): To **predict** the irregular noun based on given letters. (Set B): To **predict** the correct regular plural suffixes for the given words	(Set A): Student needs to rearrange the letters in order to form an irregular noun. (Set B): Student needs to predict the correct regular plural suffixes for the given words.	Application
4	To **analyse** the characteristics of the highlighted words	Student needs to analyse the highlighted words that fit with the characteristics give such as uncountable, countable, regular, irregular, singular and plural.	Analysis
5	To **synthesize** a noun based on the given characteristics	Students need to choose which word that fit the given characteristics.	Synthesis
6	To **assess** the knowledge in assessing the correctness of certain nouns and their plural suffixes	Student needs to assess whether the combination of the noun with a plural suffix is correct or incorrect..	Evaluation

The games were later developed using MS PowerPoint with Visual Basic Applications. A basic game template of MS PowerPoint with Visual Basic Applications as shown in Figure 1 was used to design the games. The template has the Title Page, the Game Page that has two buttons (the correct button and the wrong button) and the Score Page.

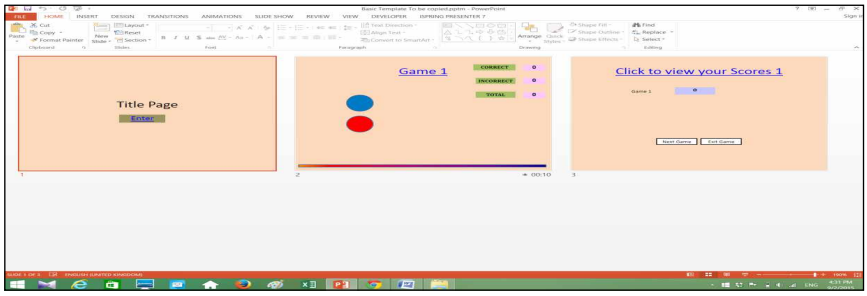
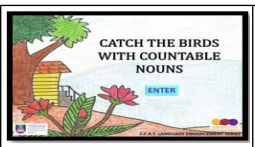
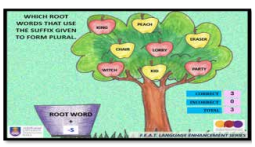
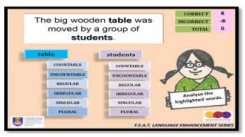
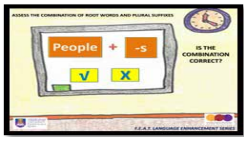
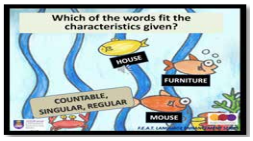


Figure 1: A Basic Game Template of MS PowerPoint with Visual Basic Applications

Pictures used in the games were drawn, coloured, scanned and edited by using Photoshop. These were done to avoid copyright issues when using downloaded pictures from the Internet. The following ()are the screen shots of the games designed:

Table 2: Game Screen Shots

Game 1			
Game 2			
Game 3			

Game 4			
Game 5			
Game 6			

SURVEY

In this stage, a set of questionnaire was prepared containing two parts. Part A was for obtaining demographic information such as age, gender, academic level and learning institution. Part B consisted 10 items to obtain students' perception on the use of the games to learn grammar. A group of students comprising 34 students of Diploma students of Universiti Teknologi MARA Seremban Campus were selected to conduct a field trial of the games. After the students played the games, a questionnaire was distributed to them. They completed the questionnaire in the presence of the researcher to assist them in completing the questionnaire. Then, the questionnaire was collected for data analysis. The purpose of the survey was to obtain students opinions on the relevance of using games for learning.

FINDINGS AND DISCUSSION

The findings of the survey are tabulated as follow():

Table 3: Findings of the Survey Respondents' Opinion about the Games

Question		Strongly Agree	Agree	**Sub Total (Strongly Agree & Agree)**	Neutral	Disagree	Strongly Disagree	Total	Mean
1	I enjoy playing the games.	17	15		2	0	0	34	4.44
	%	50.00	44.12	**94.12**	5.88	0	0	100	
2	The games are interesting.	17	15		2	0	0	34	4.44
	%	50.00	44.12	**94.12**	5.88	0	0	100	
3	The games are challenging.	13	17		4	0	0	34	4.26
	%	38.24	50.00	**88.24**	11.76	0	0	100	
4	I prefer to use the games for my revision.	18	14		2	0	0	34	4.47
	%	52.94	41.18	**94.12**	5.88	0	0	100	
5	I will play the games outside the class time.	16	13		4	1	0	34	4.29
	%	47.06	38.24	**85.30**	11.76	2.94	0	100	
6	The games help me understand the subject better.	14	19		0	1	0	34	4.35
	%	41.18	55.88	**97.06**	0	2.94	0	100	
7	The games are my way of doing revision about the subject.	13	16		4	1	0	34	4.21
	%	38.24	47.06	**85.3**	11.76	2.94	0	100	
8	I would like to have more games related to my subjects.	20	12		2	0	0	34	4.53
	%	58.82	35.30	**94.12**	5.88	0	0	100	
9	Playing games related to my subjects is not wasting my time.	19	13		1	1	0	34	4.47
	%	55.88	38.24	**94.12**	2.94	2.94	0	100	

Question		Strongly Agree	Agree	**Sub Total (Strongly Agree & Agree)**	Neutral	Disagree	Strongly Disagree	Total	Mean
10	I can improve my English proficiency through playing games.	23	10		1	0	0	34	4.65
	%	67.65	29.41	**97.06**	2.94	0	0	100	

Almost all the students preferred to use the games for their revision (94.12%), would play the games outside the class time (85.30%), believed that the games helped them understand the subject better (97.06%), believed that the games were their way of doing revision about the subject (85.30%), they would like to have more games related to their subjects (94.12%), believed that playing games related to their subjects was not wasting their time (94.12%), and they could improve their English proficiency through playing games (97.06%). The results indicate that online games are relevant to be integrated in language learning.

Online games for learning grammar are computer-based grammar programs. Students enrolling a language course usually come with different learning styles and language proficiency. Nutta (1998) assures that computer-based grammar programs can offer more than simple practice and reinforcement of grammar items learnt in class since computer-based grammar programs have the ability to personalize instruction and address different students'learning styles by incorporating multimedia. Therefore, they may prefer using online games for learning as online games have the features that suit their learning styles, they can select appropriate levels of online games, and they can control their learning pace according to their current proficiency level. Hence, online games can promote the acquisition of second language structure (Nutta, 1998).

Other useful findings are students also found that the online games enjoyable (94.12%), interesting (94.12%), and challenging (88.24%). Online games are enjoyable due to their interactivity thus players may find them interesting that cause players to participate in them (Turkay & Adinolf, 2012). Online games for instructional purposes need to be challenging in order to boost post-game reflections and promote learning (Turkay & Adinolf, 2012).

CONCLUSION

In conclusion, online games are relevant in language learning to be used as enhancement activities outside the classroom. What makes online games ()interesting and challenging need to be explored in order to ensure students participate in them. Further research on features of interesting and challenging online games can shed lights to game developers in designing online games that are engaging and teachers in evaluating engaging online games for their class use.

REFERENCES

Anyaegbu, R., Ting(Jessy), W., & Li, Y. (2012). Serious game motivation in an EFL classroom in Chinese primary school. *Turkish Online Journal of Educational Technology*, *11*(1), 154–164. Retrieved from http://files.eric.ed.gov/fulltext/EJ976578.pdf

Bellotti, F., Kapralos, B., Lee, K., Moreno-Ger, P., & Berta, R. (2013). Assessment in and of serious games: An overview. *Advances in Human-Computer Interaction*, *2013*. doi:10.1155/2013/136864

Berk, R. A. (2011). Research on PowerPoint : From Basic Features to Multimedia. *International Journal of Technology in Teaching and Learning*, *7*(1), 24–35. Retrieved from http://www.sicet.org/journals/ijttl/issue1101/2_Berk.pdf

Boyle, E. a., Connolly, T. M., Hainey, T., & Boyle, J. M. (2012). Engagement in digital entertainment games: A systematic review. *Computers in Human Behavior*, *28*(3), 771–780. doi:10.1016/j.chb.2011.11.020

Butler, Y. G. (2014). The use of computer games as foreign language learning tasks for digital natives. *System*, *1*(24). doi:10.1016/j.system.2014.10.010

Chen, Y.-C. (2014). An empirical examination of factors affecting college students' proactive stickiness with a web-based English learning environment. *Computers in Human Behavior*, *31*, 159–171. doi:10.1016/j.chb.2013.10.040

Cornillie, F., Thorne, S. L., & Desmet, P. (2012). ReCALL special issue: Digital games for language learning: challenges and opportunities. *ReCALL*, *24*, 243–256. doi:10.1017/S0958344012000134

Ellis, H., Heppell, S., Kirriemuir, J., Krotoski, A., & McFarlane, A. (2006). *Unlimited learning: Computer and video games in the learning landscape*. *London: Entertainment and leisure Software Publishers Association*. Retrieved from http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Unlimited+learning.+Computer+and+video+games+in+the+learning+landscape#0

Epper, M. R., Derryberry, A., & Jackson, S. (2012). Game-Based Learning. *Research Bulletin, Center for Applied Research*, 1–11. Retrieved from https://net.educause.edu/ir/library/pdf/ERB1208.pdf

Fu, F. L., Su, R. C., & Yu, S. C. (2009). EGameFlow: A scale to measure learners' enjoyment of e-learning games. *Computers and Education*, *52*(1), 101–112. doi:10.1016/j.compedu.2008.07.004

Garrett, N. (2009). Computer-assisted language learning trends and issues revisited: Integrating innovation. *Modern Language Journal*, *93*, 719–740. doi:10.1111/j.1540-4781.2009.00969.x

Garris, R., Ahlers, R., & Driskell, J. E. (2002). Games, Motivation, and Learning: A Research and Practice Model. *Simulation & Gaming*, *33*(4), 441–467. doi:10.1177/1046878102238607

Gunter, G. a, Kenny, R. F., & Vick, E. H. (2006). A Case for a Formal Design Paradigm for Serious Games. *The Journal of the International Digital Media and Arts Association*, *3*(2004), 1–19. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.93.3845&rep=rep1&type=pdf

Jafari, D., Madani, D., & Maghsoudi, M. (2013). The Effect of Brain-Based Learning on Iranian EFL Learners' Achievement and Retention. *Procedia - Social and Behavioral Sciences*, *70*(October), 508–516. doi:10.1016/j.sbspro.2013.01.088

Juul, J. (2003). The Game , the Player , the World : Looking for a Heart of Gameness. In *Level Up: Digital Games Research Conference Proceedings* (pp. 30–45). Retrieved from http://www.jesperjuul.net/text/gameplayerworld/

Kee, K., Vaughan, T., & Graham, S. (2010). The Haunted School on Horror Hill: A Case Study of Interactive Fiction in an Elementary Classroom. In Y. Baek (Ed.), *Gaming for Classroom-Based Learning: Digital Role Playing as a Motivator of Study*. Hershey: Information Science Reference.

Khonmohammad, H., Gorjian, B., & Eskandari, Z. (2014). Using Games to Affect Learners' Motivation in Learning Grammar, *5*(March), 324–341. Retrieved from http://www.ijllalw.org/finalversion5327.pdf

Klopfer, E., Osterweil, S., & Salen, K. (2009). Moving learning games forward. *Flora*, *3*, 58. doi:10.1207/S15327825MCS0301_02

Lin, H. W., & Lin, Y. L. (2013). Digital educational game value hierarchy from a learners' perspective. *Computers in Human Behavior*, *30*(2014), 1–12. doi:10.1016/j.chb.2013.07.034

Nutta, J. (1998). Is computer-based grammar instruction as effective as teacher-directed grammar instruction for teaching L2 structures? *Calico Journal*, *16*(1), 49–62. doi:10.11139/cj.16.1.49-62

O' Brien, D. (2010). A Taxonomy of Games. In Y. Baek (Ed.), *Gaming for Classroom-Based Learning: Digital Role Playing as a Motivator of Study*. Hershey: Information Science Reference.

Oommen, A. (2012). Teaching english as a global language in smart classrooms with powerpoint presentation. *English Language Teaching*, *5*(12), 54–61. doi:10.5539/elt.v5n12p54

Schaaf, R. (2012). Does digital game-based learning improve student time-on-task behavior and engagement in comparison to alternative instructional strategies? *Canadian Journal of Action Research*, *13*(1), 50–64. Retrieved from https://www.google.com/url?sa=t&rct=j&q=&

esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0CB0QFjAA&url=http://cjar.nipissingu.ca/index.php/cjar/article/download/30/27&ei=mvg9VdbiCIuJuAS1koHoDQ&usg=AFQjCNGNt8BLLcui2APw5X1P6syCLEh9wg&sig2=idWrLvg4mCGdXOwt2ZsSKQ

Schifter, C. C. (2013). Games in Learning, Design, and Motivation. In M. Murphy, S. Redding, & J. Twyman (Eds.), *Handbook on innovations in learning* (pp. 149–164). Philadephia: Information Age Publishing. Retrieved from http://www.centeril.org/handbook/games_in_learning_sa.pdf

Shenying, J., & Danli, L. (2012). An Empirical Study of Blended Teaching Model in University English Teaching. *Creative Education*. doi:10.4236/ce.2012.34076

Siko, J., & Barbour, M. (2013). Game design and homemade PowerPoint games: An examination of the justifications and a review of the research. *Journal of Educational Multimedia and Hypermedia*, *22*(1), 81–108. Retrieved from http://www.editlib.org/p/40658

Smith, G. G., Li, M., Drobisz, J., Park, H. R., Kim, D., & Smith, S. D. (2013). Play games or study? Computer games in eBooks to learn English vocabulary. *Computers and Education*, *69*, 274–286. doi:10.1016/j.compedu.2013.07.015

Thang, S. M., Fook, F. W., Noorizah, M. N., Rosniah, M., Najihah, M., & Kemboja, I. (2012). Using a blended approach to teach English for Academic Purposes: Malaysian students' perceptions of redesigned course materials. *International Journal of Pedagogies and Learning*, *7*(2), 142–153. doi:10.5172/ijpl.2012.7.2.142

Turkay, S., & Adinolf, S. (2012). What do Players (Think They) Learn in Games? *Procedia - Social and Behavioral Sciences*, *46*, 3345–3349. doi:10.1016/j.sbspro.2012.06.064

Yolageldili, G., & Arikan, A. (2011). Effectiveness of Using Games in Teaching Grammar to Young Learners. *Ocuklara Dilbilgisi Öğretiminde Oyun Kullanmanın Etkinliği*, *10*(1), 219–229. Retrieved from http://

search.ebscohost.com/login.aspx?direct=true&db=ehh&AN=67363107&site=ehost-live

An Exploration Study On Blended Learning Experiences In A Public Higher Institution In Malaysia

Johan @ Eddy Luaran[1], Nor Aziah Alias[2], Mohammad Mubarrak Mohd Yusof[3] , Roslinda Alias[4]& Jasmine Jain[5]

[1,2,3,4]Faculty of Education, Universiti Teknologi MARA (UITM), Malaysia
[5]School of Education, Taylor's University

Received Date : 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

The advancement in information communication technology (ICT) has changed how people communicate with each other in both society and the business world. In higher education (HE), it has changed how stakeholders such as students and academics gain access to information. Academics need not carry a pile of books to lecture or print out dozens of handouts; research students no longer need to attend the library to renew books or to find a journal article. Instead, the Virtual Learning Environment (VLE), digital library, online journal articles and a variety of educational ICT are pervasive. Technological innovations impact on the learning and teaching experience in higher educational institutions (HEIs). Many universities have spent much effort and resources in attempting to respond to such changes related to the digital culture and move to blended learning approach. Blended learning, involves the combination of two fields of concern: technology and education. However, current literature shows less consideration on the potential disciplinary gap in the blended learning experience, as a result there is a paucity of evidence from institutional investigations. This study aimed to explore, analyse and compare the blended learning experience in higher education. The research is reflected in 3 questions: (1) What are the current blended learning experiences in the higher educational institutions in Malaysia? (2) How does the blended learning experience vary in different disciplines (social science-based academics and science-based academics)? (3) What are the reflections on the comparative experiences

in (1) and (2)? In addition, the research offers a contribution to knowledge that leads to the establishment of an underlying blended learning model in the later stage. The research aims for a notable shift from the conventional technological framework towards an insight into the blended learning principles underpinned by educational theory.

Keywords: *Blended Learning, higher education, information communication technology*

INTRODUCTION

One of the challenges faced by modern HEIs is to find out how to construct and deploy highly supportive learning environments which could be used to provide face to face (f2f) instructions, self-paced collaborating groups, and in a variety of locations and over a distance as required (Alistair, 1995). This could be realized in a blended learning setting. In the last decade, technology, such as online learning materials, discussion boards and e-assessment systems, blended with the conventional f2f education has been regarded as "blended learning". The Cambridge Advanced Learner's Dictionary defines education as "the process of learning and teaching"; and technology as "the practical, especially industrial, use of scientific discoveries".

Blended learning means the process of f2f learning and teaching events that are mixed with practical use of technology or online activities. Ward and LaBranche (2003) claim that blended learning is often labeled as "the best of both worlds". The term "blended learning" emerged from corporate training and has been widely adopted around the world . The definition of blended learning, however, is controversial among researchers and practitioners (Whitelock, 2004; Oliver and Trigwell, 2005). Macdonald (2007) describes blended learning as a "hot topic nowadays but everyone has a different understanding of what it means". Blended learning is a widely used term but some researchers criticise the term's lack of validity which has gained ground with practitioners and not theorists. Macdonald's claim is possibly right due to the ambiguous meaning of blended learning. Therefore, the research is an attempt to explore academics' views and possible educational theories which may enrich the definition and theoretical ground for blended learning.

The recent literature review exhibits two trends in blended learning definitions and research: (1) educational-focus and (2) technological-focus. For example, in an educational-focused manner Bliuc, Goodyear and Ellis (2007) define blended learning as "learning activities that involve a systematic combination of co-present (f2f) interactions and technologically-mediated interactions between students, teachers and learning resources". In contrast, in a technological-focused manner Allan (2007) describes blended learning as "the use of different internet-based tools including chat rooms, discussion groups, Podcasts and self-assessment tools to support a traditional course". In the last decade, much of the blended learning research has been devoted to technological-centred design and development rather than taking an educational-focus (Alavi, 1994; Fong, Kwan and Wang, 2008). To use Brabazon's (2007) term, "technology in education" highlights technologies that were designed, developed and used in education - technology is the primary focal point in the research and practice.

Blended learning studies based on pedagogical principles are few but have gradually increased (Mehrotra, Hollister and McGahey, 2001; Watson, 2001; Simonson, Smaldino, Albright and Zvacek, 2006; Chew and Jones, 2007). Their central concern is the process of learning and teaching rather than technology or how to use technology alone. In Brabazon's (2007) term, these research or practices are labelled as "education intechnology".

The different blended learning focus appears to be the results of disciplinary differences. Predictably, technologists show more interest in educational technology than professional educational theorists do (Bouras and Albe, 2008). The sociologist and educationist considers less the "what and how" state-of-the-art technology can aid education. Likewise, the technological scientist may not be concerned with the agenda which the sociologist and educationist focus on. Less attention has been paid to the pedagogical considerations. The educational technology developed by the technologist, consequently, may not meet the academics' or learners' needs. Thus, the rationale for this research is to investigate the potential gap of the two contrasting disciplines (ICT-related discipline and non-ICT related discipline) from different institutions - by identifying, analyzing and comparing the academics' experiences and perceptions on blended learning.

Graham (2006) indicates that blended learning could enable access and flexibility, enhance learning and teaching practices, and transform the way the individual learns or teaches. Laurillard (2002) proposes the rethinking of learning and teaching at university mediated by educational technology. Vaughan and Garrison (2005) further interpret blended learning as a fundamental redesign approach to enhance learning and teaching by rethinking and revisiting current practice. These claims are explored further, especially whether or not and how the "blended learning enabled, enhanced and transformed" learning in various disciplines.

> "…the aim of education is the knowledge not of facts but of values. Values are facts apprehended in their relation to each other, and to ourselves. The wise man is he who knows the relative values of things. In this knowledge, and in the use made of it, is summed up the whole conduct of life." (Dewey, 1997)

Bonk and Grahan (2006) claim that there has been a lot of hype around learning and teaching mediated by technology. There have been national studies concentrating on institutional e-learning or blended learning practices in both the UK and the US (Allen, Seaman and Garrett, 2007). Most of them focused on the study of environments or perspectives for e-learning or blended learning. They were all quantitative studies with a large sample size – country-wide HEIs. Qualitative investigations on blended learning experience and research were conducted by a few researchers such as Sharpe, Benfield, Roberts and Francis (2006). Comparing these institutional investigations, this research differs in three ways. First, blended learning experience and smaller sample size are investigated to provide an in-depth exploration. Second, HEIs are selected for socio-culturally wider blended learning strategies, practice and experience investigation. Third, comparison is highlighted and reflected to inform disciplinary issues. The research is an attempt to bring attention to such dimension as institutional strategies, disciplinary gap and disconfirming experience which have been less focused on by previous research.

In this research, it will study on the current blended learning experience of HEIs in Malaysia. Findings from the possible gap, confirming experience or disconfirming experience between contrasting disciplines. The outcomes of this study are analysed and justified to inform blended learning principles

to enhance learning and teaching practice in the educational paradigm. The study is important because it seeks to understand the current problems and opportunities of blended learning strategies and experience in HE enabled by the technological as well as pedagogical drivers. The research is an attempt to explore the possible disciplinary gap and develop some cross-disciplinary principles in a blended learning context. It is also acts as a comparative research for the conventional blended learning environment in different dimensions - from different discipline to different HEI. In addition, the research offers a contribution to knowledge that leads to the establishment of an underlying blended learning model in the later stage. The research aims for a notable shift from the conventional technological framework towards an insight into the blended learning principles underpinned by educational theory.

Role of the Learner in Technology Integration

Generally, in Malaysia, the central attention to education is the outcome of education, not the effectiveness of the learning process. Therefore, learners' are given insufficient attention to the process and yet feel abandoned along the courses. Although blended learning allows learners to study beyond the classroom, there should be a system to monitor student performance and progress in learning process. Without this system, a learning process may lose direction and fizzle out (Chitravelu, et al. 1995).

Blended learning is believed to provide many benefits to the learners. In order to experience full advantages of the educational opportunities available using blended learning approach, the learners have to become less of passive and more active participants in the learning process (Stansfield, McLellan & Connolly, 2004). Moreover, blended learning offers excellent possibilities for placing students at the centre of learning. Learners are being encouraged to take part in discussions forum and make valuable contributions to the learning process. The central importance is given to learning and the learner.

The methodology used in blended learning environment requires that learners take an active part in the learning process and participate by posting up their ideas, responding to colleagues and sharing their thoughts and views. Lungu (2013) in her study on the significance of blended learning technology into ESP classes, suggest blended learning provides easiness in

learning English because students could have 24/7 access to their interactive learning materials, allowing them to study at anytime and at anyway.

However, the use of blended learning can pose challenges for students. Unrealistic expectations and feelings of isolation are some of the challenges experienced by the students. Vaughan (2007) cites previous studies () have shown that students enrolled in blended courses can sometimes have unrealistic expectations. The students have the tendency to assume that fewer classes meant less work and experienced problems with accepting responsibilities to manage their own learning. Students have also reported feeling isolation due to the reduce opportunities for social interaction in a face-to-face classroom environment (Smyth et al., 2012).

Consideration of learners' needs and expectations is important to determine student satisfaction and willingness to take the courses. Bliuc et al., 2007; Harris et al., 2009; Mitchell & Honore, 2007 explain that managing learners' expectations and level of understanding are important for development and implementation of successful blended learning modules. Furthermore, blended learning can only be successfully implemented if the learners have sufficient knowledge of, and are willing to use, the newly introduced technology. Learners must be trained and equipped to navigate the information and communication technology used in blended learning (Beadle & Santy, 2008; Harris et al., 2009).

REVISITING HIGHER EDUCATION AND TECHNOLOGY

A general but superficial consensus today is that education or technology can improve the quality of life. For example, Hinton (2005) signifies that the value of HE is to "hold the promise of opportunity for improvements in the quality of life for people of all cultures". Moller (2004) affirms that technology breakthroughs have held the promise to improve life. Watson (2001) states that ICT is often seen as a "catalyst for change" that impacts on teaching style and learning approaches (Jones, Chew, Jones and Lau, 2009). Since both HE and technology held the promise for "life changing, impact and improvement", the researcher would like to pose the question at the beginning of this literature review: ICT innovations impact on learning and teaching experience in HE and are often perceived as a "catalyst for change".

However, has ICT enhanced the quality of learning and teaching? (What are the good practices or disruption for blending technology higher educational experience?) The response to this question leads to the development of the idea for blended learning, which is the subject of this research.

Enhancement, normally, implies the improvement from the current state to another agreeable or satisfied level. To what "quality" the learning and teaching shall be enhanced may be related to the learning outcomes of a particular course or, in a wider context, the aim or role of higher education (HE). Such an educational aim is complicated. University has always been a physical place for educators, researchers and students to come together, to interact and to construct knowledge and skills. HEIs today are disrupted and pressurised by many forces, including digital culture and the emergence of the digital society. Since HEIs are intellectual communities which sit within the society, it is almost impossible to exist without technological aid. The digital culture has promoted the views of education as a potential market (Poster, 2005). Educational projects in Malaysia like "one laptop per family" and "Internet Village" have impact to the use of blended learning. However, some of the massive e-learning projects failed due to several key reasons such as lack of considerations for pedagogy, different cultures and complex educational environments (Meyer, 2006). The complexities of globalisation, educational and socio-cultural issues brought pressure to bear on modern higher education. To address these imperatives, a few major pressures based on Turban's Three Pressures Model were identified (Turban et al., 2002).

The constant pressures illustrated in Figure 1 play a disruptive role that is continuously shaping educational aims and policies and moving the directions of higher education from what educational researchers claim it should be. Under the rapid demand from the market, globalisation and government policy, university has been transformed from an "autonomy organism" to a "knowledge industry". Research may be conducted for publication purposes without actually "doing it" and for that reason academics may put less effort in learning and teaching. One might focus less on students' development on knowledge, practical skills and personality (Delors et al., 1996) compared with research; alternately, one might place emphasis on "teaching-only attitude" as that is the major "business" in the educational market. The role of the university may be weakened sociologically and

epistemologically with such a paradigm shift. Pelletier (2005), for example, contends that higher education has been suffering from an identity crisis. Nowadays, HE is finding ways to respond to globalisation, market demand, government policy and the rapid innovation in technology. The role of a HEI has become much more complicated in the process of responding to these pressures. It is often necessary to revisit the role and the identity of a university as well as the educational aims. The greatest challenge of higher education today, as Bates and Poole (2003) assert, is the quality of learning and teaching, and the need to revisit the aims of learning and teaching.

THEORIES RELATED TO BLENDED LEARNING

Behaviourism

Fundamentally, the best-known operant behaviourist, B. F. Skinner says that behaviourist model is derived from the stimulus-response approach where the learner is conditioned to respond based on stimulus. Under this paradigm, the orientation to learning emphasizes the outcome, or observable elements of particular behaviour responses in the learning process (Gredler, 2005).

From the behavioural viewpoint, the stimulus-response approach gives impact to the instructional design. Since behaviourism is stimulus-response based, the instructional design is depending on the classroom environments besides retaining the appropriate stimuli to serve the intended behaviour. In the context of learning, Skinner believes the stimuli are the form of reinforces that follow a response and that tend to strengthen behaviour or increase the probability of a recurrence of that response constitute a powerful force in the control of human behaviour (Brown, 1987). As the behaviorists mentionthat learning is strictly influenced by environmental factors and stimuli, this view is shown clearly through an example demonstrated by Skinner in a case of a baby who accidently touches a nearby object and hears a tinkling bell sound occurs. As the baby look in the direction from which the sound came, she manages to find the direction. The situation shows how the baby operated on her environment. Her responses were reinforced until finally a particular concept of behavior was learned.

Hence, blended learning approach is presented based on theory of behaviorism. Implications of this theory in the classroom have been discussed by many researches previously. The audio lingual method inspired by behavioristic principles has had a lasting impact on teachers' understanding of the process of human learning. As cited by Brown (1987), the audio lingual method emphasizes learners with the stimuli and it stresses repetition and reinforcement (operant conditioning) in order to develop desired habits. This is similar to the case of the baby as aforementioned. Additionally, the learning environment uses much tapes, language labs and visual aids to aid the learners.

Cognitivism

Unlike behaviourism, cognitivism focuses on the internal mental activities where learning is seen as information processing. Constructivists refer learning as a process of active construction of learner. Cognitivism carries the notion that "learning involves the reorganization of experiences in order to make sense of stimuli from the environment" (Merriam & Caffarella, 1999). The cognitive theory of learning is best described as a meaningful learning. In other words, learning itself will happen when the learner "attempt to make sense of their experiences".

The term meaningful learning is further described by Brown (1987) as, "a process of relating and anchoring new material to relevant established entities in cognitive structure". This indicates that the learning process involves learning through receiving, storing and retrieving information from the materials and the learning process is further developed by the learners through their existing knowledge structure (also known as schema) in order to learn better. In the present research, implications of cognitivism theory of learning are important throughout the instructional design models. With this notion, the study does consider learners' background knowledge and experience with blended learning approach before implementing the approach in their learning process. The study also considers the appropriate tasks needed in order for learners to effectively achieve the learning outcome. This is supported by Blanton (1998) in his view on cognitive learning theory that, "the instructional goals should include learners needs and interest, reflect the concerns of society, and make every effort to insure that goals are

focused at least toward the present and, hopefully, toward the future needs of the learner."

Constructivism and Social Constructivism

The theories that focus on processes and interaction, whether individually or socially, are the constructivism and social constructivism learning theories (Hung, 2001). Under the constructive paradigm, as advocated by Piaget (1960) and Bruner (1990), these theories emphasize the notion that whatever activities in person mind and environment have to be constructed by the individual through knowledge discovery (Piaget, 1960).

In the theory of constructivism, knowledge is believed cannot be simply passed on from learner to learner. Knowledge is acquired through how one's own mind constructs knowledge (based on own interpretation). Boethel & Dimock (2000) outline the six assumptions of constructivism theory of learning:

1. Learning is an adaptive activity.
2. Learning is situated in the context where it occurs.
3. Knowledge is constructed by the learner.
4. Experience and prior understanding play a role in learning.
5. There is resistance to change.
6. Social interaction plays a role in learning.

RESEARCH QUESTIONS

The key aim of this research is to explore, analyze and compare the blended learning experiences in higher educational institutions and Malaysia. This study is reflected in the research questions below:

1. What are the current blended learning experiences in the higher educational institutions in Malaysia?

2. How does the blended learning experience vary in different disciplines (social science-based academics and science-based academics)?

3. What are the reflections and the lessons learnt from the comparative experiences in (1) and (2)?

METHODOLOGY

This study is a descriptive research and using questionnaire as the instrument. The questionnaire consists of three sections which are (1) Blended learning approaches, (2) Students' readiness on blended learning and (3) Perception towards blended learning. The questionnaire was adapted from Al Zumor (2013)and using Likert Scale as a medium of measurement.

RESULTS

Demographic Data

Table 1 presents the demographic data in which the questionnaires had been distributed. A total of 261 were completed and returned by the students from higher education. The majority of the respondents with total of 194 were female respondents (74.3%) while 67 of them were male respondents (25.7%).

Table 1: Gender

Gender	Frequency	Percentage
Male	67	25.7
Female	194	74.3
Total	261	100

Table 2 below, presents the percentage of the age groups of the repondents. All of the 261 respondents in the study were between the ages of 20 and above 45 years old, with the vast majority (38.3%) between 26 and 35 years old. Standing in 33.7 percent is between the age 36 and 45 years old followed by the age above 45 years old with 27.2 percent. The least number of respondents were those between the age 20 and 25 (0.8%).

Table 2: Percentage of the Age Groups

Age	Frequency	Percentage (%)
20-25 years old	2	0.8
26-35 years old	100	38.3
36-45 years old	88	33.7
Above 45 years old	71	27.2
Total	261	100

Table 3 describes the faculty in which the respondents were from. The respondents were from a total of 26 different faculties, being the Faculty of Computer and Mathematical Sciences with the majority number of the respondents with 18.80 percent. There were 4 faculties with 4 respondents each, Faculty of Law, Faculty of Chemical Engineering, Faculty of Civil Engineering and Centre of Foundation Studies and 1 respondent only from Faculty of Mechanical Engineering (0.40%).

Table 3: Faculty of the Respondents

Faculty	**Frequency**	**Percentage (%)**
Faculty of Law	4	1.50
Faculty of Administrative Science and Policy Studies	6	2.30
Faculty of Communication and Media Studies	3	1.10
Faculty of Art and Design	5	1.90
Faculty of Music	3	1.10
Faculty of Education	3	1.10
Faculty of Electrical Engineering	7	2.70
Faculty of Mechanical Engineering	1	0.40
Faculty of Chemical Engineering	4	1.50
Faculty of Civil Engineering	4	1.50
Faculty of Pharmacy	7	2.70
Faculty of Medicine	3	1.10
Faculty of Dentistry	2	0.80
Faculty of Health Sciences	13	5
Faculty of Computer and Mathematical Sciences	49	18.80

Faculty of Architecture, Planning and Surveying	17	6.50
Faculty of Sport Science and Recreation	3	1.10
Faculty of Plantation and Agrotechnology	3	1.10
Faculty of Accountancy	7	2.70
Faculty of Business Managament	46	17.60
Faculty of Hotel and Tourism Management	11	4.20
Faculty of Information Management	2	0.80
Academy of Language Studies (APB)	35	13.40
Academy of Contemporary Islamic Studies (ACIS)	11	4.20
Centre of Foundation Studies (CFS)	4	1.50
Faculty of Applied Science	8	3.10

Table 4 presents the campus of the respondents. The highest number of respondents were from UiTM Shah Alam which is 47 respondents (18%). UiTM Johor Branch, UiTM Bernam Campus and UiTM Sarawak Samarahan 2 Campus were in the middle with 7 respondents each (2.70%). The least number of respondents were from UiTM Puncak Perdana Campus, UiTM Selayang Campus, UiTM Johor Branch Pasir Gudang Campus, UiTM Kelantan Branch and UiTM Terengganu Kuala Terengganu Campus with 1 respondent each (0.40%).

Table 4: Campus of the Respondents

Campus	**Frequency**	**Percentage (%)**
UiTM Shah Alam	47	18
UiTM Puncak Alam Campus	30	11.50
UiTM Puncak Perdana Campus	1	0.40
UiTM Selayang Campus	1	0.40
UiTM Sungai Buloh Campus	2	0.80
UiTM Section 17 Campus	5	1.90
UiTM Johor Branch	7	2.70
UiTM Johor Branch Pasir Gudang Campus	1	0.40
UiTM Kedah Branch	11	4.20
UiTM Kelantan Branch	1	0.40

UiTM Kelantan Branch Kota Bharu Campus	4	1.50
UiTM Terengganu	10	3.80
UiTM Terengganu Kuala Terengganu Campus	1	0.40
UiTM Pahang	19	7.30
UiTM Melaka	2	0.80
UiTM Melaka Jasin Campus	6	2.30
UiTM Negeri Sembilan Branch	13	5
UiTM Negeri Sembilan Branch Seremban Campus	8	3.10
UiTM Perak	19	7.30
UiTM Perak Tapah Campus	11	4.20
UiTM Perlis	17	6.50
UiTM Pulau Pinang	15	5.70
UiTM Pulau Pinang Bertam Campus	7	2.70
UiTM Pulau Pinang Balik Pulau Campus	0	0
UiTM Sabah Branch	9	3.40
UiTM Sabah Branch Tawau Campus	0	0
UiTM Sarawak	5	1.90
UiTM Sarawak Samarahan 2 Campus	7	2.70
UiTM Sarawak Mukah Campus	2	0.80

Computer and Internet Facilities

Table 5: Computer and Internet Facilities

Item	Response	Frequencies	Percentage
Does your university provide computers for lecturers?	Yes	235	90
	No	26	10
Does the computer provided by your university have Internet connection?	Yes	253	96.90
	No	8	3.10
Do you have Internet access through a WiFi connection on your mobile phone?	Yes	208	79.70
	No	53	20.30
Do you subscribe to any data plan for Internet connection?	Yes	221	84.70
	No	40	15.30

Do you have Internet access through cellular network (3G or 4G) on your mobile phone?	Yes	225	86.20
	No	36	13.80

Table 6 presents period of time in which the respondents had been using the computers. Majority of the repondents had been using the computer and Internet for more than 5 years with the percentage of 92.70%. 12 respondents had been using the computer and Internet between the 3 and 5 years (4.60%). 1.90% and 0.80% of the respondents had been using in between 1 and 2 years and less than 1 year respectively.

Table 6: Year(s) of Using Computer

Year(s) of Using Computer	Frequency	Percentage (%)
Less than 1 year	2	0.80
1-2 years	5	1.90
3-5 years	12	4.60
More than 5 years	242	92.70

Table 7 describes on how frequent the respondents access to the Internet. On this question, the respondents were allowed to choose more than one answer. Majority of the respondents which is 96.20% of them accessed to Internet everyday, 3.40% accessed more than once a week while 0.40% were not an Internet user.

Table 7: Access to Internet

Access to Internet	Frequency	Percentage (%)
Everyday	251	96.20
Once a week	0	0
More than once a week	9	3.40
Once a month	0	0
Not an Internet user	1	0.40

(Respondents can choose more than one answer)

Table 8 describes the respondents' activities when they are connected to the Internet. For this question, the respondents can choose more than one answer. Activity that majority of the respondents often engaged in when connected to the Internet was searching for information (95%). The third activities that was most often engaged by the respondents are online learning activities (59%). 10% of the respondents also answered 'Other' as the activity they were engaged to while connected to the Internet.

Table 8: Activities when Connected to the Internet

Activity	Frequency	Percentage (%)
Email	235	90
Searching for information	248	95
Online Learning Activities	154	59
Entertainment	123	46
Other	26	10

(Respondents can choose more than one answer)

Perception on Blended Learning Approach as Teaching Delivery Method

Table 9 shows that 66.70% of the respondents have registered as blended learning instructor while 33.30% had not registered.

Table 9: Blended Learning Registration

Response	Frequency	Percentage (%)
Yes	174	66.70
No	87	33.30

Table 10 presents the respondents' responses on 11 given questions in finding out their perception on blended learning approach as teaching delivery method. These questions were presented to the respondents in a likert scale with the highest being strongly agree, agree, not sure, disagree and strongly disagree. Item 10 has the highest mean which is 4.13 with standard deviation of 0.91 while item 9 is in the middle with mean of 3.70 and standard deviation of 1.02. Item 7 on the other hand, has the lowest mean which is 3.14 with standard deviation of 1.12.

Table 10: Perception on Blended Learning Approach as Teaching Delivery Method

No	Item	Mean	Standard Deviation
10	Blended Learning decreases costs disseminating teaching materials (printing)	4.13	0.91
3	Lecturers may conduct the course anywhere and anytime using Blended Learning approach (provide flexibility).	4.05	0.93
1	Students may exposed to variety of learning resources using Blended Learning approach	3.93	0.97
5	Lecturers can expand their creativity of delivering teaching process using Blended Learning approach	3.86	0.99
2	The problem of insufficient classroom and lab can be reduced by using Blended Learning approach	3.81	1.09
9	Blended Learning approach is a platform to share ideas and experience among students	3.70	1.02
6	Students and the lecturers can have more interactivity activities outside class using Blended Learning approach	3.57	1.08
8	Blended Learning approach supports cooperative / peers learning among students	3.47	1.05
11	Blended Learning approach encourages students to participate in the discussion (reduce inhibition)	3.40	1.11
4	It is easy for the lecturer can get online responses/participations from students	3.22	1.18
7	Students can learn better using Blended Learning approach	3.14	1.12
	Average	3.66	0.79

(1-Strongly Disagree, 2-Disagree, 3-Not Sure, 4-Agree, 5-Strongly Agree)

i-Learn Portal as Official Learning Management System (LMS) to Support Blended Learning Approach

The table below presents the respondents' responses to six questions in order to find out whether i-learn portal as official learning management system (LMS) supports the blended learning approach. Based on the table, item 1 has the highest mean, which is 3.73 with standard deviation of 0.91 where the respondents responded that the i-Learn Portal is easy to be accessed. Item 2 and item 5 are have the middle mean of 3.43 and 3.31 with 0.93 and 1.01 respectively. Item 4 has the lowest mean, 2.73 with standard deviation of 1.03 that shows that there is technical issues when using i-Learn Portal.

No	Item	Mean	Standard Deviation
1	It is easy to access i-Learn Portal	3.73	0.91
3	Sufficient training for lecturers on using i-Learn Portal	3.62	0.99
2	i-Learn Portal is user friendly Learning Management System (LMS)	3.43	0.93
5	i-Learn portal is a good platform to obtain variety of learning resources	3.31	1.01
6	Features provided in i-Learn Portal are sufficient to support Blended Learning approach	3.17	0.97
4	There is no technical issues when using i-Learn Portal	2.73	1.03
	Average	3.33	0.76

(1-Strongly Disagree, 2-Disagree, 3-Not Sure, 4-Agree, 5-Strongly Agree)

In Your Opinion, What Is/Are Features Should Be Provided in i-Learn Portal to Enhance its Functionality as Official LMS?

Based on the respondents' responses most of them would like i-Learn portal to be user friendly and mobile friendly. According to the respondents, some of the features in i-Learn portal were complicated for them and the students to use where there was no step-by-step guide to help them in the process of using the portal. Besides that, respondents mentioned that the students were reluctant to use i-Learn portal because they were unable to access it using their mobile phone unlike Facebook group.

The respondents also suggested that there will be more functions and options to create and to answer tests and quizzes. The respondent pointed out that:

> *"At Assessment Manager (To create quiz/test etc) need more function during making question like, a) cannot insert image or figure or table, b) no new line means text not to go to next line when enter (no need to insert
 tags) c) cannot submit and evaluate essay question especially programming code d) cannot modified question from question bank AT Course/Group Forum a) cannot delete other thread (as instructor) to avoid spam message/thread"*

Thus, they proposed to have more flexible in how the test and quizzes being displayed, for example to make YouTube video clips to be embedded in the tests and quizzes. Besides that, the respondents would like it if variety of activities and teaching approaches to be made available in i-Learn portal and not just limited to tests and quizzes. A few of the respondents also proposed that i-Learn portal to be made like iClass (iNED). One respondent stated that:

> *"If i were to compare between ilearn and iclass (ined), I choose ined. Why? simple, easy to understand, not so many icons, and friendly user. I would suggest ilearn follow exactly the feature of iclass."*

The respondent shared that iClass (iNED) is simple, easy to use and has less icons which simplifies the process of accessing and operating the portal.

Barriers in Conducting Course using Blended Learning Approach

The table below shows the responses on the barriers in conducting course using blended learning approach. Item 4 has the highest mean which is 3.64 with standard deviation of 1.18 that shows the Internet connection in faculty/office is not sufficient to conduct online learning. Item 8 is in the middle with mean of 3.08 and standard deviation of 1.14 which shows that blended learning approach increase he respondents' teaching workload. Item 7 has the lowest mean which is 2.63 with standard deviation of 1.16 that shows the respondents were not sure how to conduct course using blended learning approach.

Table no/title

No	Item	Mean	Standard Deviation
4	The Internet connection in faculty / office is not sufficient to conduct online learning	3.64	1.18
2	Online assessment such as online quizzes and tests are difficult to manage	3.44	1.17
11	I have problem in obtaining students' engagement in online learning	3.44	1.14

5	The faculty / campus does not provide variety of software to develop digital course content	3.35	1.06
12	It takes times for me to have skills on conducting course using Blended Learning approach.	3.30	1.16
1	There are limited number of computers connected to the Internet	3.23	1.35487
8	Blended Learning approach increase my teaching workload	3.08	1.14
10	I have problem in monitoring students' online participation	3.04	1.22
3	There is no online tools suitable for my course to conduct online assessment such as online quizzes and tests	2.93	1.20
9	I do not have knowledge on online pedagogy	2.87	1.19
6	I am not exposed to variety of Web 2.0 tools to conduct my online learning activities	2.78	1.07
7	I am not sure how to conduct course using Blended Learning approach	2.63	1.16
	Average	3.05	0.69

(1-Strongly Disagree, 2-Disagree, 3-Not Sure, 4-Agree, 5-Strongly Agree)

Suggestions to Improve Blended Learning Approach in UiTM

The table below presents the respondents' response on the suggestions to improve blended learning approach in UiTM. With the mean 3.35 and standard deviation of 1.04, the respondents preferred to conduct their course using current blended leaning approach.

Item	Mean	Standard Deviation
I prefer to conduct my course using current Blended Learning approach.	3.35	1.04

(1-Strongly Disagree, 2-Disagree, 3-Not Sure, 4-Agree, 5-Strongly Agree)

In Your Opinion, What Is the Best Way to Implement Blended Learning Approach in Teaching and Learning Process?

Based on the responses from the respondents, the best way to implement Blended learning approach in teaching and learning process is to have a good and stable internet connection to access the portal as well as to upload and download files. A few respondents stated that:

> *"When the internet server speed is heightened (improved) and (lecturers and students can) access o it is 24/7".*

> *"...because when i upload file, its not working. The students cannot download that file. there's an error"*

> *"The internet connection wifi is very important. I used to conduct my test online. But student complained that they always got problem with the wifi / internet connection".*

Besides that, respondents said a user friendly portal will make it easy and able to motivate lecturers and students to use it. Futhermore, the respondents suggested to give freedom for the lecturers and the students to include and share other webtools in i-Learn portal like blendspace and google drive.

Other way to implement Blended learning approach in teaching and learning process according to the respondents is by providing the lecturers and students training on current and relevant softwares and applications as well as on how and when to use materials in blended learning. One respondent pointed this:

> *"1. More training on current and relevant softwares/ applications (internal & external). 2. Need strong support groups 3. Encourage lecturers to use computers in the teaching and learning process 4. Benchmarking! 5. Smaller students in one class."*

Lecturers and students should also be provided with support group to guide them in using Blended learning approach. One repondent also suggested the best way to implement blended learning in teaching and

learning process is by introducing the approach to the students since their school years to help them to familiarize of the concept and understand the importance and benefits of this approach.

Please Leave Your Comment or Suggestion on Blended Learning Implementation in UiTM

Based on the comments and suggestions of the respondents on blended learning implementation in UiTM, majority suggested the university to fix the Internet connection and to make i-Learn portal as mobile friendly and user friendly. Besides that, i-Learn portal needs to improve the assessment manager to create tests and quizzes to have more functions and features. Some respondents who taught Mathematics complained that the assessment manager does not support certain Mathematical equations. One respondent pointed this:

> *"...not suitable for all mathematics subject"*

Some of the respondents also suggested that the university should provide trainings for lecturers and students on blended learning and encourage them of the importance and benefits of blended learning;

> *"1. More training on blended learning hould be provided at campuses / branches level. 2. A skillful personal specific to guide lecturers to prepare blended learnbing (learning) depend on each lecturer's need should be provided and available all the time of semesters."*

Although many agree on the implementation of blended learning with improvement on certain areas, there were respondents who think that face-to-face interaction with the students is better than interaction with them online due to the students preferance in using Internet to access to their social network and entertaiment purposes only as stated by the respondent below:

> *"Frankly I think the blended learning approach is not suitable for the majority of UiTM students. Undoubtedly it is true that students (youngsters) today are more internet and online savvy but this must not be equated to their willingness to learn. Mostly*

they are online for ntertainment/social purposes and not to fulfill their learning desire. This may sound old fashion, but students learn more effectively through traditional classroom method."

In Your Opinion, What are the Examples of Teaching and Learning Activities that Need to be Implemented by the Lecturers to Encourage Online Learning Participation among Students?

Based on the respondents' responses, they suggested to have activities such as forums and discussions where there will be two-way communication between the lecturers and students. As stated by the respondents:

"Forum and discussion on certain topic in a course"
"Discussion, forum, interactive learning through online (interactive resources in i learn)"

Live chats and video conference would also encourage the students to participate in online learning. Futhermore, dialogue sessions and virtual learning would also work too. Majority of the respondents suggested that activities that involved interactive voice and video feeds as well as animations and illustrations would encourage students to participate in the online learning. Therefore, respondents would like it if the i-Learn portal supports images and videos to be embedded and uploaded to the portal for assessment, discussions, tests and quizzes. As stated by there respondents:

"Video clippings of task related to topics e.g. I am teaching Environmental Health Law,..."

"Let the students make their own video and upload the video for other students to view and learn from their peers."

"Using visual aids such as pictures, videos, films as a motivational tools in enhancing students' interest in a particular subject."

Besides that, activities like projects and presentations that involve sharing various types of teaching materials in any format, for example, PowerPoint slides, Prezi and iSpring, would encourage the students'

participation in online learning. Some of the respondents also suggested that the institution to provide trainings for the students on using different softwares and materials so that they will be encouraged to explore and apply what they have been trained to their online learning.

CONCLUSION

Blended learning has the ability to enhance and transform learning in various areas. However, to achieve this, it is important to explore, analyse and compare the blended learning experience in higher education in order to discover more about blended learning in higher education and at the same time offers a contribution to knowledge that leads to the establishment of an underlying blended learning model in the later stage.

Based on the responses provided by the respondents, majority of them view blended learning as a good way for teaching and learning though a lot of improvements and preparations need to be done by the institutions, from providing a stable Internet connection to trainings as blended learning can only be successfully implemented when the learners are prepared and have sufficient knowledge to apply the information and communication technology used in blended learning.

REFERENCES

Abdullah Sanusi Ahmad. (2003). Addressing e-learning challenges via blended learning: Open University Malaya approach. Monsoura, Egypt.

Alistair, G., F., M. (1995) 'Future Pattern of Teaching and Learning', In Allan, B. (2007) Blended Learning Tools for Teaching and Training. London:Facet Publishing.

Alavi, M. (1994) 'Computer-mediated Collaborative Learning: an Empirical Evaluation, Computer-mediated discussion', Journal of Educational Computing Research, 8, 291-309

Allen, I., E., Seaman, J. and Garrett, R. (2007) Blended In: The Extent and Promise of Blended Education in the United States. Needham, MA:Sloan-Consortium.

Bates A., W. and Poole, G. (2003) Effective Teaching with Technology in Higher Education. CA: John Wiley & Son.

Beadle, M., & Santy, J. (2008). The early benefits of a problem-based approach to teaching social inclusion using an online virtual town. Nurse Education in Practice, 8(3), 190-196.

Brabazon, T. (2007) The University of Goolge: Education in the (post) Information Age. Humphries: Ashgate Publishing.

Blanton, B. B. (1998). The Application of the Cognitive Learning Theory to Instructional Design. International Journal of Instructional Media, 25(2), 171-177.

Bonk, C., J. and Graham, C., R. (Eds.) (2006) The Handbook of Blended Learning: Global Perspectives, Local Designs, San Francisco. CA: Pfeiffer Publishing.

Bouras, A. and Albe, V. (2008) 'Viewpoints of Higher Education teachers About Technologies', Springer: International Journal of Technology And Design Education, 18 (3), 285-305.

Beothel, M. & Dimock, K. V. (2000). Constructing Knowledge with Technology. Austin, TX: Southwest Educational Development Laboratory.

Bliuc, A., M., Goodyear, P. and Ellis, R., A. (2007) 'Research Focus and Methodological Choices in Studies into Students' Experiences of Blended Learning in Higher Education', Internet and Higher Education, 10, 231-244

Brown, H. D. (1987). Principles of language learning and teaching (2nd Ed.). Englewood Cliffs, NJ: Prentice-Hall.

Bruner, J. (1990). Acts of meaning. Cambridge: Harvard University Press.

Beothel, M. & Dimock, K. V. (2000). Constructing Knowledge with Technology. Austin, TX: Southwest Educational Development Laboratory.

Blanton, B. B. (1998). The Application of the Cognitive Learning Theory to Instructional Design. International Journal of Instructional Media, 25(2), 171-177.

Bliuc, A. M., Goodyear, P., & Ellis, R. A. (2007). Research focus and methodological choices in studies into students' experiences of blended learning in higher education. The Internet and Higher Education, 10(4), 231-244.

Brown, H. D. (1987). Principles of language learning and teaching (2nd Ed.). Englewood Cliffs, NJ: Prentice-Hall.

Brown, A. L., &Duguid, P. (1991). Organisational learning and communities of practice: Towards a unified view of working, learning, and innovation. Organisational Science, 2(1), 40–57.

Bruce, B. C. (1997). Literacy technologies: What stance should we take? Journal of Literacy Research, 29(2), 289–309.

Bruner, J. (1990). Acts of meaning. Cambridge: Harvard University Press.

Chew, E. and Jones, N. (2007) 'The Marriage of Freire and Bloom: An Assessment Prototype for Pedagogy of the Oppressed and Higher Order Thinking', Loughborough University: The Proceeding of the 11th International Computer Assisted Assessment (CAA) Conference: Research into E-Assessment, 10-11th July, 2007, 117-125.

Cuban, L. (2001). Oversold and underused: Computers in the classroom. Cambridge, MA: Harvard University Press.

Chitravelu, N., Sithamparam, S., & Choon, T.S. (1995).ELT Methodology Principles and Practice, Malaysia: PenerbitFajarBaktiSdn. Bhd.

Delors et al. (1996) Learning: the Treasure within: Report to UNESCO of the International Commission on Education for the Twenty-First Century. Paris: UNESCO Publishing.

Dewey, J. (1997). Democracy and Education. New York: Free Press. Fong, J., Kwan, R. and Wang, F., L. (Eds.) (2008) Hybrid Learning and Education, Springer-Verlag Berlin Heidelberg: Lecture Notes in Computer Science LNCS5169.

Dewey, J. (1981). The experimental theory of knowledge. In McDermott, JJ (ed.) The philosophy of John Dewey, University of Chicago Press, Chicago.

Dewey, J., & Bentley, A. F. (1949). Knowing and the known. Boston: Beacon.

Duhaney, D. C. (2000).Technology and The Educational Process: Transforming Classroom Activities.International Journal of Instructional Media, Vol. 27(1), pp. 67- 72.

Entwistle, N., McCune, V., &Hounsell, J. (2002). Approaches to study and perceptions of university teaching–learning environments: Concepts, measures and preliminary findings. Edinburgh, UK: Enhancing Teaching-Learning Environments in Undergraduate Courses Project, University of Edinburgh, Coventry University, and Durham University. Retrieved from http://www.etl.tla.ed.ac.uk/docs/ETLreport1.pdf

Farahiza Zaihan Azizan. (2010). Blended Learning in Higher Education Institution in Malaysia. Proceedings of Regional Conference on Knowledge Integration in ICT.KolejUniversiti INSANIAH, Alor Star, Kedah.

Fisher, K. (2010). Technology-enabled active learning environments: an appraisal,Australia:University of Melbourne.

Graham, C. R. (2006) 'Chapter 1: Blended learning systems: Definition, Current Trends, Future directions', In BONK, C., J. and GRAHAM, C., R. (Eds.),Handbook of Blended Learning: Global Perspectives, Local Designs. San Francisco, CA: Pfeiffer Publishing.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. The Internet and Higher Education, 7(2), 95-105.

Graham, C. R. (2006). Blended learning system: Definition, current trends and future direction. In: Bonk, C. J., Graham, C. R. (eds.) Handbook of Blended Learning: Global Perspectives, Local Designs, 3- 21. Pfeiffer, San Francisco.

Gredler, M.E., (2005). Learning and instruction: Theory into practice (5th Ed.). New Jersey: Prentice Hall.

Hung, D. (2001).Theories of Learning and Computer- Mediated Instructional Technologies.International Council for Education Media. Retrieved from http://www.tandf.co.uk/journals.

Harris, P., Connolly, J., & Feeney, L. (2009). Blended learning: Overview and recommendations for successful implementation. Industrial and Commercial Training, 41(3), 155-163.

Hisham Dzakiria, Che Su Mustafa & Hassan Abu Bakar. (2006). Moving forward with blended learning as a pedagogical alternative to traditional classroom learning.Malaysian online Journal of Instructional Technology (MOJIT), Vol.3(1), 11- 18.

Hofman, D.W. (2002). Internet-based distance learning in higher education. Tech Directions, 62(1), 28–32.

Hung, D. (2001).Theories of Learning and Computer- Mediated Instructional Technologies.International Council for Education Media. Retrieved from http://www.tandf.co.uk/journals.

Jones, N., Chew, E., Jones, C., Lau, A. (2009) ‘Over the Worst or At the Eye of the Storm?’, The Journal of Education and Training,51(1), 6-22.

Koehler, M.J., & Mishra, P. (2008). Introducing TPCK. AACTE Committee on Innovation and Technology (Ed.), The handbook of technological pedagogical content knowledge (TPCK) for educators (pp. 3-29). Mahwah, NJ: Lawrence Erlbaum Associates.

Lizzio, A., Wilson, K., & Simons, R. (2002). University students' perceptions of the learning environment and academic outcomes: Implications for theory and practice. Studies in Higher Education, 27(1), 27-52.

Lungu, I. (2013). The Increasing Need for Blended Learning Models in Courses of English for Specific Courses in Romanian Universities. Journal of Social and Behavioral Sciences 76, 470-475.

Lungu, I. (2013). The Increasing Need for Blended Learning Models in Courses of English for Specific Courses in Romanian Universities. Journal of Social and Behavioral Sciences 76, 470-475.

Laurillard, D. (2002) Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies (2nd Edition). London: Routledge.

MacDonald, J. (2007) Blended Learning and Online Tutoring: Planning Learner Support and Activity Design (2nd Edition). Hampshire: Gower

Merriam, S. B. & Caffarella, R. S. (1999). Learning in Adulthood: A Comprehensive Guide. (2ndEdition). San Francisco: Jossey-Bass

Meyer, K., A. (2006) 'The Closing of the US Open University', Educause Quarterly, 29(2), 5-7.

Moller, L. (2004) 'Conference Keynotes for Educational Communication and Technology Conference on Emerging Technologies and Theories for Teaching and Learning', SpringerLink: Journal of TechTrends, 48(4), 14-15.

Marlia Puteh & Supyan Hussin. (2003). Internet and Language Teaching. In: Konvensyen PTPM, PersatuanTeknologiPendidikan Malaysia ke-16, 13 - 16 June 2003, City Bayview Hotel, Melaka.

Merriam, S. B. & Caffarella, R. S. (1999). Learning in Adulthood: A Comprehensive Guide. (2ndEdition). San Francisco: Jossey-Bass.

Mitchell, A., & Honore, S. (2007). Criteria for successful blended learning. Industrial and Commercial Training, 39(3), 143-149.

Oliver, M., Trigwell, K. (2005) Can 'Blended Learning' Be Redeemed? E–Learning, 2(1), 17-26.

Poster, M. (2005) 'History in the Digital Domain', In LAND, R. and BAYNE, S. (Eds)The University in the Information Age. London: Routledge Falmer Schuller, T. (Ed.) The Changing University? Buckingham: The Society for Research into Higher Education & Open University Press, 53.

Pelletier, C. (2005) 'New Technologies, New Identities', In LAND, R. and BAYNE, S. (Eds.) The University in the Information Age. London: Routledge Falmer.

Piaget, J. (1960).The psychology of intelligence. NJ: Littlefield, Adams & Co.

Piaget, J. (1960).The psychology of intelligence. NJ: Littlefield, Adams & Co.

Rosenblatt, L. M. (1978). The reader, the text, the poem: The transactional theory of literary work. Carbondale: Southern Illinois University Press.

Ruiz, J. G., Mintzer, M. J. and Leipzig, R. M. (2006). The impact of e-learning in medical education. Academic Medicine, Vol. 81, No. 3,207-212.

Saltzberg, S., &Polyson, S. (1995). Distributed learning on the World Wide Web. Syllabus, 9(1), 10-12.

Singh, H., & Reed, C. (2001). A White Paper: Achieving Success with Blended Learning. ASTD State of the Industry Report, Alexandria, VA: American Society for Training & Development, 1-11.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. Educational Researcher, 15(2), 4–14.

Smyth, S., Houghton, C., Cooney, A., & Casey, D. (2012). Students' experiences of blended learning across a range of postgraduate programmes. Nurse Education Today, 32(4), 464-468.

Soyemi, J. ,Ogunyinka, O. I, &Soyemi, O. B. (2012).Integrating Self-Paced E-Learning with Conventional Classroom Learning in Nigeria Educational System. Proceedings of the 1st International Technology, Education and Environment Conference, African Society for Scientific Research (ASSR), 127- 133.

Stacey, E., & Gerbic, P. (2007).Teaching for blended learning: Research Perspectives from on- campus and Distance Students, Education and Information Technologies, Vol. 12, 165- 174.

Stansfield, M., McLellan, E., & Connolly, T. (2004). Enhancing student performance in online learning and traditional face-to-face class delivery. Journal of Information Technology Education, 3, 173-188.

Subramaniam, G. (2013). Change teaching approach in schools first. The Star Online. Retrieved from http://www.thestar.com.my/News/Nation/2013/09/08/Melta-Change-teaching-approach-in-schools-first/

Smyth, S., Houghton, C., Cooney, A., & Casey, D. (2012). Students' experiences of blended learning across a range of postgraduate programmes. Nurse Education Today, 32(4), 464-468. Special Issue of Education: Communication and Information.

Sharpe, R., Benfield, G., Roberts, G. and Francis, R. (2006) The Undergraduate Experience of Blended e-learning : a Review of UK Literature and Practice. UK: The Higher Education Academy.

Turban, E., McLean, E., Wetherbe, J., Bolloju, N. and Davison, R.,(2002) Information Technology For Management: Transforming Business In The Digital Economy (3rd Edition). NJ: John Wiley & Sons New references after additional references:

Vaughan, N., D. and Garrison, D., R. (2005) 'Creating Cognitive Presence in a Blended Faculty Development Community', Internet and Higher Education, 8(1), 1-12.

Vaughan, N. D. (2007). Perspectives on blended learning in higher education. International Journal on E-Learning, 6(1), 81-94.

Veal, W. R., & MaKinster, J. G. (1999). Pedagogical content knowledge taxonomies [Electronic version]. Electronic Journal of Science Education, 3(4). Retrieved from http://unr.edu/homepage/crowther/ejse/ejsev3n4.html.

Vrasidas, C., & Mc Isaac, M. S. (2000). Principles of pedagogy and evaluation for Web-based learning. Educational Media International, 37(2), 105-112.

Ward, J. and LaBranche, G., A. (2003) 'Blended Learning: The Convergence of e-learning and Meetings', Franchising World, 35(4), 22-23.

Whitelock, D. (2004) 'Blended Learning: Forget the Name But What About The Claims?' In Whitelock, D. and Mason, R. (Eds), Blended Learning.

Wan Fatimah Wan Ahmad Afza Shafie, Josefina Barnachea Janier & Aliza Sarlan (2007). Exploring Universiti Teknologi PETRONAS Students' Attitudes towards Learning Application of Integration using Courseware. Proceedings of 1st International Malaysian Education Technology Convention, UTM, 313-319.

Wang, L. C.,& Bagaka's, J. G.(2002). Understanding the dimensions of self-exploration in Web- based learning environments. Journal of Research on Technology in Education, 34(3), 364-375.

Williams, N. A., Bland, W., & Christie, G. (2008). Improving student achievement and satisfaction by adopting a blended learning approach to inorganic chemistry. Chemistry Education Research and Practice, 9(1), 43-50.

Yang, S.C. & Chen, Y. J. (2006). Technology-enhanced language learning: A case study. Journal of Computers in Human Behavior 23(2007), 860-879.

The Integration of Techno-Pedagogical Approach in Teaching and Learning Among Lecturers in Public Universities in Malaysia

Mohammad Mubarrak Mohd Yusof[1], Nor Aziah Alias[2], Johan @ Eddy Luaran[3]& Jasmine Jain[4]

[1,2,3]Faculty of Education, Universiti Teknologi MARA (UITM), Malaysia
[4]School of Education, Taylor's University

Received Date : 9 April 2017
Accepted Date: 27 May 2017

ABSTRACT

The dynamism of the technological world has resulted in overwhelming resources, enriching the process of meaning making and information gaining. Such facets surround the growth of present students, forming the "new millennium learners". These learners are associated with different expectations of meaningful learning. With the immense potential technology holds in innovating educational practices, there is a need for educators to master the techno-pedagogical content knowledge (TPK) alongside with the subject matter to be taught. TPK is a framework encompasses two different types of knowledge, namely technological knowledge and pedagogical knowledge. As a fragment of the knowledge areas making up Techno-Pedagogical Content Knowledge by Mishra & Koehler (2006), TPK is a staple skill for the 21st century educators. This is especially true when the educational landscape nowadays is overwhelmed with vast array of digital devices. Other than that, there is also a need for teachers to be creative in using their techno-pedagogy skills, referring to the ability of the teachers to make lesson interesting though technological and imaginative approaches. The study attempts (1) to study the current level of techno-pedagogical knowledge among lecturers in public universities in Malaysia. (2) To study how techno-pedagogical knowledge help lectures in integrating blended learning into their teaching and learning process.(3) To study the impact of techno-pedagogical approach in teaching and learning in Public universities in Malaysia. This study will be carried out using quantitative and qualitative approaches where two different questionnaires on techno-

pedagogy and pedagogical creativity will be distributed to a large number of lectures. In-depth interviews and observation will be conducted with selected lecturers to provide further insights on the data collected. It is hoped that the findings of this study can provide further insights on the need to emphasize on the techno-pedagogical skills and consequently, improve the current TPK courses available for lecturers.

Keywords: *Techno-pedagogical, Teaching and Learning*

INTRODUCTION

The current scenario of Malaysian public university witnesses exponential growth of learners who are thriving for higher degree of knowledge hence promoting bigger number for enrollment each year. Despite the goal of getting more learners and training them to become skillful and knowledgeable workers in realizing Vision 2020, the outsourced facilities of the public university can be a barrier to large enrollment. Consequently, the integration of technology into education has brought a different paradigm in viewing education in higher institutions, emphasizing blended learning as a panacea. Besides enabling learning through virtual communication and setting, educational technology provides numerous benefits.

Technology has been recognized as a powerful enabler, endowed with vast potential to innovate the education practices (Atkinson & Castro, 2008). Recent decades has recognized the need for learners to learn in the environment supporting their need to understand contents in animated, dynamic and unusual manner. One of the impetus resulting from this thinking is the development of various policies worldwide, including Malaysia, emphasizing on the provision of such assess to technologies. For example, the smart school initiative in Malaysia in 1997 was started with the aim to integrate ICT into education (MOE & MSC, 2010). Following that, all schools in Malaysia are equipped with computer labs and internet connection to foster technological literacy, eliminating the digital divide and build a community of technology users (MOE, 2009). However, the investment in placing computers did not yield expected outcomes for pedagogical change as it was later found out that teachers ICT literacy competence is not equivalent to their technological pedagogy competency (Ala-Mutka, 2008).

One factor of such shortcoming is because teachers simply cram and fit new technologies in the existing pedagogical structure instead of engineering a new model for more effective pedagogical framework (Bottino, 2003; Coldwell, 2003; Kwang, 2010).**

The need for individuals to equip themselves with ample skills of technology also has been extensively emphasized, as mastering such skills allow them to use, manipulate and disseminate information in the sophisticated world. However, the real importance underlying the need for students to have technological skills is the lifelong learning it promotes; providing freedom for learners in shaping their own learning paths through collaborations and new technologies (Attwell, 2007). Hence, educators have to emphasize the use of technology to motivate learners to use and understand the potential for meaningful learning through digital platforms. Other than that, the developments of information, communication, knowledge and technology in the recent era have resulted in a different type of learners, compared to the traditional era. ***2.*** Pedro (2006) claimed that these learners are the cohorts growing up surrounded with digital media. He referred them as the "new millennium learners" associated with short attention spans, multi-tasking and non-linear ways in retrieving information. Hence, educators teaching the new millennium students need to attract and retain the attention of the students in different ways during the teaching and learning process (Ala-Mutka et al., 2008).This can be more challenging as students learn best differently and educators need to have a wide pedagogical coverage to cater for meaningful learning for each kind of learners.**

Not limited only to the subject matter needed to be taught, the educators are also expected to have the pedagogical content knowledge in order for them to teach effectively, and creative enough to incorporate multiple approaches in teaching to suit various types of learners. While the common facet of assessment in educators' education courses emphasizes on the content knowledge and the pedagogical content knowledge, integrating ICT into educators' pedagogy has been under explored in the local setting. Studies conducted locally has insofar investigated on Smart School Project (Azizah Yaa'cob et al., 2005; Sharifah Maimunah Syed Zin, 2003; Ong & Ruthven, 2009), ease of use of technological gadgets (Moses et al., 2013; Samuel & Bakar, 2006) and on the readiness of teaching with ICT (Koo, 2008; Goh & Md. Wahid, 2006). These studies suggested that the

competency of local educators to integrate ICT into education has been sidelined. Hence, educators' techno-pedagogical competency is placed under the focus in this study.

Another facet that was brought to the fore is the educators' creative teaching ability, referring to teachers' ability to manipulate and incorporate different approaches in teaching. It has also been reported that "one-size-fits-all" techno-pedagogy does not result in effective instructions as students learn differently (Oster-Levinz & Klieger, 2011). Hence, it is required them to be able to manipulate the technology in different ways to convey the lesson for various types of learners. While it is acknowledged that students are more dominant in a type of learning, multiple approaches in teaching methods benefits more students. For example, the creative way of teaching can blend all audio, kinesthetic and visual learning at once to benefit a wider range of learners with different learning preferences.

LITERATURE REVIEW

The exponential growth of technologies has propelled various transformations in life and foster dynamism in various walks of life. The need for individuals to equip themselves with ample skills of technology has been extensively emphasized, as mastering such skills allow them to use, manipulate and disseminate information in the sophisticated world. However, the real importance underlying the need for students to have technological skills is the lifelong learning it promotes; providing freedom for learners in shaping their own learning paths through collaborations and new technologies (Attwell, 2007). Information, communication, knowledge and technology in the recent era have resulted in a different type of learners, compared to the traditional era. ***2.***Pedro (2006) claimed that these learners are the cohorts growing up surrounded with digital media. He referred them as the "new millennium learners" associated with short attention spans, multi-tasking and non-linear ways in retrieving information. Hence, educators teaching the new millennium students need to attract and retain the attention of the students in different ways during the teaching and learning process (Ala-Mutka et al., 2008). This can be more challenging as students learn best differently and educators need to have a wide pedagogical coverage to cater for meaningful learning for each kind of learners.**

Reasons For Technology-Enabled Teaching And Learning

Technology has been recognized as a powerful enabler, endowed with vast potential to innovate the education practices (Atkinson & Castro, 2008). Recent decades has recognized the need for learners to learn in the environment supporting their need to understand contents in animated, dynamic and unusual manner. One of the impetus resulting from this thinking is the development of various policies worldwide, including Malaysia, emphasizing on the provision of such assess to technologies. For example, the smart school initiative in Malaysia in 1997 was started with the aim to integrate ICT into education (MOE & MSC, 2010). Following that, all schools in Malaysia are equipped with computer labs and internet connection to foster technological literacy, eliminating the digital divide and build a community of technology users (MOE, 2009).However, the investment in placing computers did not yield expected outcomes for pedagogical change as it was later found out that teachers ICT literacy competence is not equivalent to their technological pedagogy competency (Ala-Mutka, 2008). One factor of such shortcoming is because teachers simply cram and fit new technologies in the existing pedagogical structure instead of engineering a new model for more effective pedagogical framework (Bottino, 2003; Coldwell, 2003; Kwang, 2010).**same paragraph as in intro, author need to paraphrase.

Techno-Pedagogical Content Knowledge

It is vital that every lesson intended to be delivered in class is well-planned for. Scrivener (2005) mentioned that lesson planning is important as it help the teachers to cater for more different learning styles of their learners, and provides the educator with more coherent framework for efficient teaching. Hence, developing a good plan for a particular lesson needs both sound knowledge of content and pedagogy. However, Shulman (1986) pointed out that these two knowledge are usually treated as separate concerns in teacher education trainings, and introduced the term "Pedagogical-content Knowledge" (PCK) that reflects the interrelated components for effective teaching. Extending from this notion, Hughes (2000) added technology as another component of educator's knowledge, articulating the need for technology to be blended into the teaching in the 21st century. As mentioned previously, effective usage of technology enables effective teaching and

learning and hence, the rationale for the knowledge of effective integration of technology into a lesson.

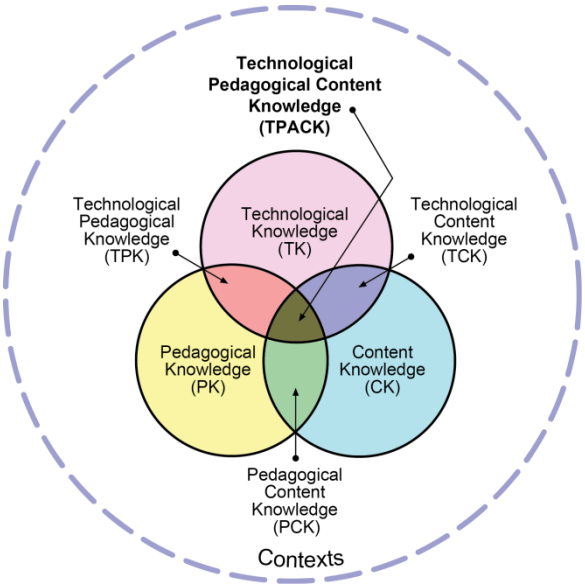


Figure 1: Framework for TPACK (Koehler & Mishra, 2009)

In the TPACK framework, there are three primary knowledge for an educator which is focused upon, namely Technological Knowledge, Content Knowledge and Pedagogical Knowledge. These three are not to be viewed in isolation, but it reflects the complex interplay of all knowledge essential for teaching with technology, positioned at the heart of this framework. The concept of TPACK goes beyond the blend of Content, Technology and Pedagogical knowledge where another four knowledge base arise from the intersection of any two. These four knowledge bases are Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK) and Technological Pedagogical Knowledge (TPK). The intersection of all three circles is the Technological Pedagogical Content Knowledge (TPACK). Quoting Koehler and Mishra (2009, para. 8), "An understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies".

While the common facet of assessment in teacher's education courses emphasizes on the content knowledge and the pedagogical content knowledge, integrating ICT into educator's pedagogy has been underexplored in the local setting. Studies conducted locally has insofar investigated on Smart School Project (Azizah Yaa'cob et al., 2005; Sharifah Maimunah Syed Zin, 2003; Ong & Ruthven, 2009), ease of use of technological gadgets (Moses et al., 2013; Samuel & Bakar, 2006) and on the readiness of teaching with ICT (Koo, 2008; Goh & Md. Wahid, 2006). These studies suggested that the local educators' competency and knowledge on techno pedagogy has been sidelined. Hence, educator's techno-pedagogical competency is placed under the focus in this study.

The Technology Integration Planning Model

The choice of whether or not to integrate technology into the classroom is up to the educator, but usually with little understanding on the impact and the strategies for technology integration during decision-making. To address the issue of integrating technology effectively into teaching, a model called Technology Integration Planning (TIP) was developed which guide educators to make good decision about integrating technology into their teaching (Roblyer & Doering, 2013), and subsequently result in successful teaching and learning outcomes.

The model outlaid three different phases for technology integration into teaching, namely Phase One: Analysis of needs, Phase Two: Planning for integration and Phase Three: Post instruction analysis and revisions.

Phase One involves the educator to reflect on the strategies that they have used or planned to use and how technology can help address the issues raised. There is also a need to review on whether the technology is necessary to be integrated or not. This is because technologies, which are used blindly or ineffectively, will only cause more burdens to the students, in understanding how both content and technology work. Besides that, the element TPACK was made an important part of the model as teaching is a complex combination of what the educator is teaching, how to teach the content in the best way, and the knowledge on the tools for them to carry out their lesson plans. Phase Two of the TIP model on the other hand, consists of more specific learning planning and products where the educators should

know the skills that he or she wants the students to learn through the lesson, the strategies that will work best in achieving that aims, and if the essential conditions for technology integration are present for the technology to support the lesson successfully. The third and last phase of the TIP model involves post-instruction analysis where the educators reflect critically on the execution of the lesson planned. Educators should constantly reflect on the outcome data and be informed of the technology-integrated methods that can be successfully implemented in the future lessons.

Scenario in Malaysian Higher Educational Institutions

With the expansion of global education and globalization, many higher educational institutions took up the initiatives of offering more diverse programs and courses, thereby increasing the need for institutional partnership, both local and international. Students' profile in HEI also witness significant changes, with more foreign students enrolled for the courses offered. The difference in geographical and demography rationalized the need for HEI to implement the use of technology in it teaching and learning process, resulting in vast investment for ICT infrastructure to support blended learning and distance education. However, a study conducted by Raja Maznah (2004) revealed that it's a norm for most HEI to provide ICT infrastructure but lack of plan to implement technology effectively. In another view, the ICT infrastructure is to only support online learning and not to enhance teaching and learning process. Enhancing more on the online learning and technology-enabled teaching and learning was also seen as a panacea to the proliferating number of students that caused limitation in classroom availability in many HEIs (Farahiza, 2010).

PURPOSE OF THE STUDY

This study will attempt to answer the following questions:

1. To study the current level of techno-pedagogical knowledge among lecturers in public universities in Malaysia.

2. To study how techno-pedagogical knowledge help lectures in integrating blended learning into their teaching and learning process.

3. To study the impact of techno-pedagogical approach in teaching and learning in Public Universities in Malaysia.

METHODOLOGY

This study is descriptive in nature and is intended to collect both quantitative and qualitative data. Lecturers in Universiti Teknologi MARA will be the population of this study. Lecturers will be chosen via cluster and systematic sampling according to their stream. There are two main streams which are Social Science and Science. This study are using questionnaire and interviews to collect the data. Data gained will be analyzed using the descriptive and inferential statistics, where the descriptive analysis describe the frequency, percentages, means and the standard deviation of the demographic details.

RESULTS AND DISCUSSION

Demographic Findings

The respondents of this study were lecturers from Universiti Teknologi MARA. A total of 104 lecturers participated in this study, which consist of 26 (25%) males and 78 (75%) females as shown in Table 1.

Table 1: Gender

Gender	Frequency	Percentage
Male	26	25
Female	78	75
Total	104	100

In terms of age, a majority of the lecturers were of age 30-39 consisting of 39 (37.5%) lecturers, 30 (28.8%) lecturers of age 40-49 years old, 17 (16.3%) lecturers of age 25-29 years old and another 18 (17.3%) lecturers were of age 50-59 years old. Table 2 shows the percentage of the age groups.

Table 2: Percentage of the Age Groups

Age	Frequency	Percentage
25-29 years old	17	16.3
30-39 years old	39	37.5
40-49 years old	30	28.8
50-59 years old	18	17.3
Total	104	100

In terms of the highest qualification, majority of lecturers have Masters (75%) consisting of 78 people and PhD (21.2%) consisting of 22 people. The rest were Bachelor Degree holders (2.9%) consisting of 3 people and only 1 (1%) of other qualification. Table 3 shows the percentage of highest qualifications by lecturers.

Table 3: Percentage of the Age Groups

Qualification	Frequency	Percentage
PhD	22	21.2
Masters	78	75
Bachelor Degree	3	2.9
Other	1	1
Total	104	100

In terms of designation, there were 62 (59.6%) lecturers, 29 (27.9%) senior lecturers, 12 (11.5%) associate professor and 1 (1.1%) of others. Table 4 shows the percentage of designation of lecturers in this study.

Table 4: Percentage of Designation of Lecturers

Designation	Frequency	Percentage
Associate Professor	12	11.5
Senior Lecturer	29	27.9
Lecturers	62	59.6
Other	1	1
Total	104	100

In terms of years of teaching experience, majority of respondents were lecturers with 6-10 years of experience (36.5%) consisting of 38 people and lecturers with less than 5 years of experience (23.1%) consisting of 24 people. Meanwhile, the rest consist of 20 (19.2%) lecturers with more than 20 years of experience, 11 (12.4%) lecturers with 16-20 years of experience while only 10 (9.6%) lecturers with 11-15 years of experience. Table 5 shows the percentage of lecturers' years of teaching experience.

Table 5: Lecturers' Years of Teaching Experience

Years of Teaching Experience	Frequency	Percentage
Less than 5 years	24	23.1
6-10 years	38	36.5
11-15 years	10	9.6
16-20 years	12	11.5
More than 20 years	20	19.2
Total	104	100

CURRENT LEVEL OF TECHNO-PEDAGOGICAL KNOWLEDGE AMONG LECTURERS IN PUBLIC UNIVERSITY IN MALAYSIA

Techno-Pedagogical Knowledge: Technology Access

The below items are to find out the current level of Techno-Pedagogical Knowledge among Lecturers in Public University in Malaysia. Table 6.0 presents the respondents' techno-pedagogical knowledge on technology access. Item 1 has the highest mean which is 4.68 with standard deviation of 0.53 while item 3 is the second highest with mean 4.44 with standard deviation of 0.55. The lowest mean is item 2 at 4.14 with standard deviation of 0.78.

Table 6: Technology Access

No	Item	Mean	Standard Deviation
1	I have access to a computer with an Internet connection.	4.68	0.53
2	I have access to a fairly new computer (e.g., Faster RAM, speakers, CD-ROM).	4.14	0.78
3	I have access to a computer with adequate software for teaching and learning (e.g., Microsoft Office).	4.44	0.55
	Average	4.42	0.46

Techno-Pedagogical Knowledge: Online Skills

Table 7.0 shows the techno-pedagogical knowledge on online skills and relationships. Item 3 has the highest mean which is 4.81 with standard deviation of 0.39. Item 5 has the middle mean which is 4.38 with standard deviation of 0.79. Item 6 has the lowest mean, 4.00 with standard deviation of 0.94.

Table 7: Online Skills

No	Item	Mean	Standard Deviation
3	I can send an email with a file attached.	4.81	0.39
1	I have the basic skills to operate a computer (e.g., saving files, creating folders).	4.74	0.44
2	I have the basic skills for finding my way around the Internet (e.g., using search engines).	4.69	0.46
4	I think that I would be comfortable using a computer if I participate in IT courses.	4.46	0.75
5	I think that I would be able to communicate effectively with others using online technologies (e.g., chat).	4.38	0.79
9	I think that I would be able to ask questions and make comments in clear writing.	4.19	0.69
7	I think that I would be able to use online tools to work on assignments with students in different places.	4.18	0.94
8	I think that I would be able to schedule time to provide timely responses to other students and/or the instructor.	4.02	0.76

6	I think that I would be able to express myself clearly through my writing (e.g., emotions, humor available in online tools).	4.00	0.94
	Average	4.38	0.46

Techno-Pedagogical Knowledge: Motivation

Table 8 is the respondents' responses regarding techno-pedagogical knowledge on motivation. Item 2 has the highest mean which is 3.67 with standard deviation of 0.95 while item 1 is in the middle with mean 3.63 and standard deviation of 0.89. Item 3 has the lowest mean, 3.27 with standard deviation of 1.03.

Table 8: Motivation

No	Item	Mean	Standard Deviation
1	I think that I would be able to remain motivated even though my students are not online at all times.	3.63	0.89
2	I think that I would be able to complete my work even when there are online distractions (e.g., friends/ colleague sending emails or Websites to surf).	3.67	0.95
3	I think that I would be able to complete my work even when there are distractions in my home (e.g., television, children, and such).	3.27	1.03
	Average	3.25	0.70

Techno-Pedagogical Knowledge: Online Audio/Video

Table 9 shows items that answer the question on the respondents' response regarding techno-pedagogical knowledge on online audio/video. Item 2 has the highest mean, 4.06 with standard deviation of 0.73. In the middle is item 3 with mean 4.05 and standard deviation of 0.73. Item 1 has the lowest mean which is 4.03 and standard deviation of 0.67.

Table 9: Online Video/Audio

No	Item	Mean	Standard Deviation
1	I think that I would be able to relate the content of short video clips (1-3 minutes typically) to the information I have read online or in books.	4.03	0.67
2	I think that I would be able to integrate video in my teaching	4.06	0.73
3	I think that I would be able to explain course related information when it's presented in video formats.	4.05	0.73
	Average	4.05	0.63

Techno-Pedagogical Knowledge: Internet Discussion

Table 10 shows the respondents' response on the techno-pedagogical knowledge on Internet discussion. The highest mean, 4.14 with standard deviation of 0.72 is item 4. The second highest mean is item 4 with 3.98 with standard deviation, 0.72. Item 2 has the lowest mean with standard deviation of 0.89.

Table 10: Internet Discussion

No	Item	Mean	Standard Deviation
1	I think that I would be able to carry on a conversation with others using the Internet (e.g., Internet chat, instant messenger).	4.14	0.72
4	I sometimes prefer to have more time to prepare responses to a question.	3.98	0.72
3	I think that I would be able to follow along with an online conversation (e.g., Internet chat, instant messenger) while typing.	3.84	0.86
2	I think that I would be comfortable having several discussions taking place in the same online chat even though I may not be participating in all of them.	3.73	0.89
	Average	3.92	0.58

Techno-Pedagogical Knowledge: Supporting Elements

Table 11 describes the respondents' techno-pedagogical knowledge on supporting elements. Item 2 has the highest mean which is 4.55 with standard deviation of 0.60. Item 3 has the middle mean which is 4.34 with standard deviation of 0.66. Item 1 on the other hand has the lowest mean which is 4.14 with standard deviation of 0.78.

Table 11: Supporting Elements

No	Item	Mean	Standard Deviation
2	Quick technical and administrative support is important to the success in online course.	4.55	0.60
4	I feel that prior experiences with online technologies (e.g., email, Internet chat, online readings) are important to the success with online course.	4.35	0.70
3	Frequent participation throughout the learning process is important to the success in online course.	4.34	0.66
5	The ability to immediately apply course materials is important to the success with online course.	4.34	0.73
1	Regular contact with my students is important to the success of online course.	4.14	0.78
	Average	4.34	0.52

Techno-Pedagogical Knowledge: ICT Abilities

Table 12 shows the respondents' techno-pedagogical knowledge on ICT abilities. Item 8 has the highest mean which is 4.67 with standard deviation of 0.46. Item 3 has the middle value of mean which is 4.33 with standard deviation of 0.83. Item 5 has the lowest mean which is 3.14 with standard deviation of 1.24.

Table 12: ICT Abilities

No	Item	Mean	Standard Deviation
8	I have experience using software such as Microsoft Office (e.g., Word, PowerPoint, and Excel)	4.67	0.46
10	I am proficient at sending/receiving emails.	4.65	0.49
11	I am proficient at sending/receiving emails with attachments.	4.63	0.55
6	I am able to use a web browser/search engine to navigate the internet (e.g., Mozila Firefox, Safari, Internet Explorer, Google Chrome etc.).	4.50	0.57
1	I have regular access to a computer or laptop each week for my course(s) (4 to 5 times a week).	4.45	0.74
3	I have access to a printer.	4.33	0.83
9	I have experience downloading/installing programs or plugins (Such as Java, Adobe Reader, Quick Time, etc.).	4.32	0.86
7	I am proficient typing on a keyboard.	4.27	0.77
2	I have regular access to the internet each week for my course(s) (4 to 5 times a week).	4.26	0.88
4	I have access to headphones or speakers for courses that may have video conferences or require student-recorded presentations.	3.59	1.16
5	I have access to a microphone for courses that may have video conferences or require student-recorded presentations.	3.14	1.24
	Average	4.25	0.50

If Your University Plans to Implement Blended Learning, How Much of Face-to-face (f2f) vs Online Do You Prefer? *

Table 13 presents how much of face-to-face (f2f) vs online respondents' prefer if their university plans to implement blended learning. Majority of the respondents which is 33 of them preferred to have 70% of f2f and 30% online (31.7%). 8 of the respondents preferred 90% of f2f and 10% online (7.7%) and minority chose 20% f2f and 80% online; and 10% of f2f and 90% online which is 2 respondents each (1.9%).

Table 13: Blended Learning Models

No	Mode	Frequency	Percentage
1	f2f 90 %: Online 10 %	8	7.7
2	f2f 80 %: Online 20 %	17	16.3
3	f2f 70 %: Online 30 %	33	31.7
4	f2f 60 %: Online 40 %	18	17.3
5	f2f 50 %: Online 50 %	17	16.3
6	f2f 40 %: Online 60 %	4	3.8
7	f2f 30 %: Online 70 %	3	2.9
8	f2f 20 %: Online 80 %	2	1.9
9	f2f 10 %: Online 90 %	2	1.9
		104	100

If Your University Plans to Implement Blended Learning, What Format Do You Prefer the Teaching Content to be Made Available Online? (Respondents can choose more than one answer)

Table 14 shows the format the respondents prefer the teaching content to be made available online. For this question, the respondents were allowed to choose more than one answer. Majority of the respondents answered 'other' (100%). 44 of the respondents answered PowerPoint Presentation only (42.3%). The least preferred format is audio only (audio recording of teaching content (16.3%).

Table 14: Teaching Content

No	Item	Frequency	Percentage
1	Reading Text Only (eg. PDF)	40	38.5
2	PowerPoint Presentation Only	44	42.3
3	Audio Only (Audio recording of teaching content)	17	16.3
4	Video Only (Video recording of teaching content)	33	31.7
5	PowerPoint with Audio (PowerPoint with audio explanation)	61	58.7

6	PowerPoint with Video (PowerPoint with video explanation)	71	68.3
7	Animated PowerPoint (e.g. Flipped PowerPoint)	63	60.6
8	Animated Text (e.g. Flipped Notes/Articles)	42	40.4
9	Text with Audio (Notes with audio explanation)	35	33.7
10	Text with Video (Notes with video explanation)	46	44.2
11	Other	104	100

If Your University Plans to Implement Blended Learning, How Often Do You Prefer to Meet Face-to-face with the Students of a Course? *

Table 15 describes how often do the respondents prefer to meet face-to-face with the students of a course if the university plans to implement Blended Learning. 71 of the respondents answered once a week (68.3%). Meanwhile 5 of the respondents chose once every three weeks and once a month each (4.8%). On the other hand, minority of the respondents answered other (3.8%).

Table 15: Frequencies of Face-to-Face Meeting

No	Item	Frequency	Percentage
1	Once a week	71	68.3
2	Once every two weeks	19	18.3
3	Once every three weeks	5	4.8
4	Once a month	5	4.8
5	Once a semester	0	0
6	Other	4	3.8

IMPACT OF TECHNO-PEDAGOGICAL KNOWLEDGE

Majority of respondents said that teaching using just whiteboard and marker is not similar to using technology. The main reason is due to technology's flexibility and higher effectiveness in elevating the overall teaching and

learning tool and experience. Furthermore, using technology would also cater to millennial students who has their own 21st century skills and preference. As one respondent shared,

> *"…technology allow the teaching and learning process more interactive, increase students' focus in class and lead to active learning. Somehow, today's generation are more attached to technology. So, technology allow them to participate more in learning session." (Lecturer A14).*

However, some respondents emphasized on the advantages of teaching using whiteboard and marker over technology. One respondent argued that *"Using whiteboard and marker are more effective mode of learning and teaching process, whereby the students are having a great experience of debating, discussion, etc" (Lecturer A3).*

Yet, several respondents noted that it depends on the teachers themselves to use the tools that caters to their teaching and learning process as well as their students. Lecturers pointed out that it is important to focus on which tool would deliver the contents effectively to students' learning as they stated below:

> *"However the use of both traditional and new media must be balanced in order to better deliver and express the information/ knowledge to the learner" (Lecturer A5).*

> *"It depends on how the tools are used, the proficiency of the teacher and the readiness of the students towards learning…" (Lecturer A20).*

Hence, majority of respondents who provided a variety of perspectives in response to teaching using just whiteboard and marker versus using technology felt that both method is dissimilar. From the analysis, their differed opinions may due to their teaching preferences or individual teaching pedagogy. Further study need to be conducted in order to reveal other underlying reasons that may affect their stance in this topic.

In the next section of the survey was concerned with the lecturers' implementation of technology.

Lecturers' Implementation of Technology

Over half of those surveyed reported that they agree on the importance of knowing how to utilize the technology to their advantages. They viewed technology as a tool to not only improve their teaching approach but also to suit their students' 21st century learning styles and skills. They shared a consensus that by having the adequate skills to use the technology would cater to their students' interest, lengthen their attention span and ensure an effective communication throughout learning process. As these lecturers stated:

> *"Yes! Very important. Students are always with gadgets and their knowledge on technology goes beyond certain educators. We have to keep up with these younger generations and current technology to make teaching and learning more interesting and accessible." (Lecturer B5).*

> *"It is important because students nowadays prefer to use the latest technology available. It is easier and faster for them to get information…prefer an interactive learning rather than traditional whiteboard method…" (Lecturer B15).*

Furthermore, lecturers added that technology implementation help to ease their workload. It save time and aid their teaching if used effectively and appropriately. One lecturer suggested, "*Yes. The technology is the main form of interaction between people for mass distribution of communication. (mass com). Lecturers involve with mass number of students and with the time constraint due to administrative work, technology is an enabler." (Lecturer B8).*

Thus, it can be derived that majority of the respondents realized on the importance of implementing technology in their teaching and learning as it improves communication between lecturers and their students in class through effective use of technologies.

In the final part of the survey, respondents were asked to describe one episode where they effectively demonstrated or modeled combining technologies and teaching approaches in a classroom or lecture.

Demonstrated or Modeled Teaching

In response to item 21, most respondents described their teaching method in class as an active user of technology. Whilst a minority mentioned that they have yet to fully utilize technology in their teaching, the rest have effectively used basic devices such as computers, laptops, ipads and projectors alongside programs like Microsoft word document, PowerPoint slides as well as videos or excerpts from movies and Youtube in their teaching.

Besides, they also conducted online quiz, online forum and utilize UiTM i-learn system in order to monitor their students' learning progress. Additional teaching materials were also given to students through a website link or related online articles. Online/offline dictionary and educational websites such as Flocabulary and paperrater.com were also mentioned as they promotes self-directed learning.

More than half respondents reported that they also used web 2.0 to collaborate and share information online with their students through the use of social medias or other platforms such as Prezi, Padlet, Powtoon, Phet, Emaze or Google Drive. As one respondent commented,

> *"I am using my ipad and stored all teaching related materials in google drive. It is convenience since I just connect my ipad to vga cable of projector. I saved my power point file into pdf format and make it offline in google drive (in case internet coverage is not available)…" (Lecturer C16).*

Overall, these results suggest that all respondents associated their experience in combining technologies and teaching approaches in class as a positive. It is shown through their comments on their students' positive feedback and enhanced teaching and learning process. On the other hand, although respondents were reported to be an active user, they are varied from basic to proficient user of technologies which suggest that further

exposure on how to integrate technologies in teaching approaches might be in line with their needs.

CONCLUSION

Technology has been recognized as a strong tool that can be used to innovate the education practices. However, to utilize it, individuals need to be equipped with ample skills of technology to allow them to use, manipulate and disseminate information in the sophisticated world. Besides that, the educators are expected to have pedagogical content knowledge so that they can teach creatively and effectively to integrate various approaches in their teaching to suit the needs of the learners. Educators also have the responsibility to emphasize to the learners, the use of technology to motivate them to use and understand the potential for meaningful learning through digital platforms.

Based on the findings, it can be seen that majority of the respondents have access to the technology as well as basic knowledge to integrate it into their teaching. However, perhaps trainings and encouragement should be given to the lecturers so that they can explore and experiment with variety of approaches and methods to get their students to participate in the lessons. Besides that, findings show that majority of the lecturers prefer to have more time in face-to-face lesson rather than online lesson and choose PowerPoint presentation with videos which can be implied that lecturers are not ready to integrate technology fully into their teaching. Hence, it is important for institutions to provide continuous support to the lecturers. It is hoped that these findings are able to provide further insights on the need to emphasize and integrate the techno-pedagogical skills and improve the current TPK courses available for lecturers.

REFERENCES

Ala-Mutka, K., Bacigalupo, M., Kluzer, S., Pascu, C., Punie, Y. and Redecker, C. (2008). *Learning 2.0: The Impact of Web 2.0 Innovation on Education and Training in Europe: Report on a validation and policy options workshop organised by IPTS*. Seville, 29- 30 October 2008. Retrieved May 2nd 2013 from http://ftp.jrc.es/EURdoc/JRC50704.

Ala-Mutka, K., Punie, Y. & Redecker, C. (2008). *ICT for Learning, Innovation and Creativity*. Retrieved May 2nd 2013 from http://ftp.jrc.es/EURdoc/JRC48707.TN.pdf

Atkinson, R. & Castro, D. (2008). *Digital Quality of Life: Understanding the Personal and Social Benefits of the Information Technology Revolution*. Available at Social Science Research Network: http://ssrn.com/abstract=1278185 or http://dx.doi.org/10.2139/ssrn.1278185

Attwell, G. (2007). *Personal Learning Environments - the future of eLearning?* e-Learning Papers, 2(1). Retreived 5th July 2013 from http://www.elearningpapers.eu/.

Azizah Yaa'cob, Nor Fariza Mohd Nor & Hazita Azman. (2005). *Implementation of the Malaysian Smart School: An Investigation of Teaching-Learning Practices and Teacher-Student Readiness*. Internet Journal of e-Language Learning & Teaching, 2(2), 16-25.

Blandow, D. and Dyrenfurth, M. J. (1994). *Technology education in school and industry: emerging didactics for human resource development*. Berlin:London: Springer-Verlag in cooperation with NATO Scientific Affairs Division.

Bottino, R. M. (2003). *ICT, National Policies, and their Impact on Schools and Teachers Development*. ICT and the Teacher of the Future, p. 41-47

Ching, S. C. , Koh, H. L., Tsai, C. C. & Tan, L. W. (2011). *Modeling primary school pre-service teachers' Technological Pedagogical Content Knowledge (TPACK) for meaningful learning with information and communication technology (ICT)*. Computers & Education, 57 (1), 1184- 1193.doi: 10.1016/j.compedu.2011.01.007

Coldwell, J. (2003). *Mapping Pedagogy to Technology – A Simple Model*. In Zhou, W. L. et al. (Eds.), Advances in Web-based learning (pp. 180-192). doi:10.1007/978-3-540-45200-3_18

Farahiza Zaihan Azizan. (2010). *Blended learning in higher education institution in Malaysia*. Proceedings of Regional Conference on Knowledge Integration in ICT 2010. pp 454-466

Koehler, M. J. & Mishra, P. (2009). *What is Technological Pedagogical Content Knowledge (TPACK)?* Contemporary Issues in Technology and Teacher Education, 9(1), p.60- 70. doi: 10.1016/j.compedu.2010.07.009

Koo, A. C. (2008). *Factors affecting teachers' perceived readiness for online collaborative learning: A case study in Malaysia*. Educational Technology & Society, 11 (1), 266-278.

Kwang Hee Hong (2010). *CALL teacher education as an impetus for L2 teachers in integrating technology*. Research on Computer Assisted Language Learning, 22, 53-69. doi: 10.1017/S095834400999019X.

Lau, B. T. & Sim, C.H. (2008). *Exploring the extent of ICT adoption among secondary school teachers in Malaysia*. International Journal of Computing and ICT research, 2(2), 19- 36.

Mahmud, R. & Ismail, M.A. (2010). *Impact of Training and Experience in Using ICT on In-Service Teachers' Basic ICT Literacy*. Malaysian Journal of Educational Technology, 10(2), 5-10.

Moses, P., Wong, S. L., Kamariah Abu Bakar & Rosnaini Mahmud. (2013). *Perceived Usefulness and Perceived Ease of Use: Antecedents of Attitude towards Laptop Use Among Science and Mathematics Teachers in Malaysia*. Asia-Pacific Educational Research. doi:10.1007/s40299-012-0054-9

Ong, E. T. & Ruthven, K. (2009). *The effectiveness of smart schooling on students' attitudes towards science*. Eurasia Journal of Mathematics, Science & Technology Education, 5(1), 35-45.

Oster-Levinz, A. & Klieger, A. (2011). *Does developing online tasks draw teachers nearer to interrelated knowledge (TPACK)?* The Association for the Advancement of Computing in Education: Proceedings of Global Learn Asia Pacific 2011.

Pedro, F. (2006). *The new Millennium Learners: Challenging our Views on ICT and Learning: OECD-CERI* http://www.oecd.org/dataoecd/1/1/38358359.pdf

Raja Maznah Raja Hussin. (2004). *E-Learning in Higher Education Institutions in Malaysia*. University of Malaya, Kuala Lumpur.

Roblyer, M. D. & Doering, A. H. (2013). *Integrating Educational Technology into Teaching (6th ed.)*. United States of America: Pearson.

Samuel, R., & Bakar, Z. (2006, May 31). *The utilization and integration of ICT tools in promoting English language Teaching and Learning: Reflections from English Option Teachers in Kuala Langat District, Malaysia*. International Journal of Education and Development using ICT [Online], 2(2). Available: http://ijedict.dec.uwi.edu/viewarticle.php?id=161.

Scrivener, J. (2005). *Learning Teaching (2nd ed.)*.United States of America: McMillan Books for Teachers.

Sharifah Maimunah Syed Zin. (2003). *Reforming the Science and Technology Curriculum: The Smart School Initiative in Malaysia.* Prospects, 33(1), 39-50.

Telos, I. (2010). *Computer Games across the Curriculum: A Critical Review of an Emerging Techno-Pedagogy*. Computer, 3, 4.

International Journal On **E-LEARNING** *And* **HIGHER EDUCATION**

VOLUME 7 | JUNE 2017

PENERBIT PRESS
UNIVERSITI TEKNOLOGI MARA

ISSN 1985-8620