

Blended E-Learning Acceptance as Smart Pedagogical Tools: An Initial Study in Malaysia

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ABSTRACT

The use of technology in classrooms has been considered as the solution to social, economic and educational problems since its introduction to education in mid-1970. There have been many studies conducted on the different aspects of the use of technology in teaching and learning. However, study on teaching with Blended Learning in teaching and learning has not been highlighted especially in Malaysian context. It examines the effects of the exogenous variables towards with use of Blended Learning in teaching and learning among secondary teachers. The proposed research variables are based on previous models of technology acceptance. A total of 98 secondary teachers completed the questionnaire measuring their responses to computer attitudes (CA), computer teaching efficacy (CTE) and school environment (SE) and Blended Learning (BL). Structural Equation Modelling (SEM) was used as the main technique for data analysis. All hypotheses were supported by the data and have direct effects towards Blended Learning use. To sum up, the study provided larger implications for development in theory, practices and policymaking that could be related to the BL use among teachers.

Keywords: Educational technology, structural equation modelling, technology integration

INTRODUCTION

The integration of technologies in classrooms to enhance learning have been highlighted in numerous studies (Wong, Teo & Russo, 2013; Katsamani, Retalis, & Boloudakis, 2012; Lu & Law, 2012). In this regards, Malaysian teachers are expected to integrate technologies in their daily teaching and learning activities. Having that, many Malaysian schools, with the support from related government departments, have devoted considerable resource to technology. Malaysian schools and colleges have included computer technology as an integral part of learning experiences and as a way to equip them with the skills and knowledge necessary to succeed in the 21st century. As the consequence, electronic based teaching tools are becoming increasingly more prevalent in Malaysian classrooms. The Malaysian Ministry of Education (MOE) has highlighted the significance of computer-based technology in schools.

THE STUDY

With the innovation and web-based commercialisation of educational technology, blended e-learning environment has been widely deployed in the teacher institutions throughout Malaysia. Blended e-learning (BL) is the combination of e-learning (synchronous and asynchronous) and traditional way of teaching where it takes the benefits of both practices to create a distinguished instructional. Combination of various methods of practices, teaching tools and media formats is the main criteria in forming the blended e-learning approaches. Hence, BL is the new way of pedagogical practices that mixes various types of activities to create constructive and interesting learning environments.

There are a number of blended e-learning applications that have become easier to integrate with traditional classroom paradigm. Moodle, Blackboard and WebCT are some of the applications that seem to be bringing beneficial to students who prefer an individualised or less structured environment and optimise the learning effects.

Most of the BL applications could support e-learning activities such as revealing information, notes, quizzes, forum, assignment submission, group chat and assessments. Having such features, BL is not only able to help teachers to deliver learning materials but also at the same time track students' performance and participation.

However, despite the impetus to build blended learning realisations among teachers in higher institutions, integrating and understanding on blended e-learning environment among teachers are in the very beginning level. Many teachers revealed that the opportunity to integrate blended e-learning environment is often severely constrained by the limited information, skills and knowledge that they have gained from teacher education professional development training. Given that, undoubtedly, teachers are dealing with challenges of incorporating traditional and technology as a balance to cater holistic development of students in the newly introduced Standards-based Secondary School Curriculum (KSSM). It is pertinent to point out that in the School Based Assessment (PBS), blended e-learning platform provides room for students to improve their results (band) accordingly based on their own initiative. Teachers could furnish differentiated instructional for diverse students where demonstrated varying degrees of learning style and intelligences. Teacher can design curriculum for those in need as well as those who are ready for new challenges. Furthermore, the integration of technology in teaching and learning has been focused in the new syllabus in teaching under Ministry of Education, Malaysia.

Besides that, many studies in educational technologies have indicated the advantages of integrating blended learning in teaching and learning in developed countries (Escobar-rodriguez & Monge-lozano, 2012; Katsamani, Retalis, & Boloudakis, 2012; Lu & Law, 2012). Escobar-rodriguez & Monge-lozano (2012) and Wong, Goh and Osman (2013) revealed that learners able to achieve higher grades when teachers using technologies in teaching and learning. Indeed, students can learn more skills throughout the integration of BL.

Advocates also noted that, BL teaching and learning tools have become very suitable to encourage collaborative and constructive learning which highly emphasized in today learning styles. Furthermore, based on Malaysian curriculum, many subjects in which educational technologies are frequently employed to achieve the above learning practices.

Given the vital role of BL teaching and learning for in our current Malaysian educational system, and growing concern the vital responsibility of practicing teachers the process of integrating blended learning in schools, time has come to review and examine factors that influence BL acceptance among these teachers.

The findings from this study enable policymakers and educators have a better view and more informed knowledge on the factors that have significant impacts on the use and acceptance of BL. They are more inclined to design programmes that enhance the use of BL among teachers. Thus, the purpose of the study is to explore and understand how far factors such as School Environment, Computer Attitudes and Computer Teaching Efficacy could have significant relationship with BL acceptance in teaching among Malaysian teachers.

Research model and hypotheses development

Computer Attitudes

Based on literature studies, many establish technology acceptance models have revealed that computer attitude is the significant contribution to the use of technologies in teaching and learning. Theory of Planned Behavior (TPB) (Ajzen, 1985), Technology Acceptance Model (TAM) (Davis, 1989). Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) are the noted technology acceptance models. TAM, TPB and TRA were based on the relationship of attitude-intention-behavior (actual) constructs. Based on those models and theories, attitudes construct has been the main focus. Ajzen (1975) argued that by understanding an individual's attitude toward an object, one can predict his or her overall pattern of response to the object. An individual's attitude represents an individual's personal convictions and feelings towards a specific object or behavior. Generally, a person who believes that performing a given behavior will lead to positive outcomes will hold a favourable attitude toward performing the behavior. On the other hand, a person who believed that performing a given behavior will lead to negative outcomes will hold an unfavourable attitude toward performing the behavior.

Arising from the technology acceptance models, many studies have been carried out in developing countries and also reveal that computer attitudes have significant correlation with the actual acceptance and use of technology (Liu, Chen, Sun, Wible, & Kuo, 2010; Luan & Teo, 2009; Wong, Osman, Pauline & Khairezan, 2013; Wong, Russo, & McDowall, 2013; Wong, Teo, & Goh, 2014; Wong, Teo, & Russo, 2012). Based the above statement, the following hypothesis was developed.

H1. CA will have a significant influence on BL.

Computer Teaching Efficacy

According to Bandura's social cognitive theory (Bandura, 1977), individual with high self-efficacy will have better ability to cope with roadblocks and endure stress related to change. Conversely, an individual with low self-efficacy will be less likely to attempt innovation or follow through as barriers arise. Many previous researchers, such as Marcinkiewicz (1994), Torkzadeh, Pfulghoef and Hall (1999), Gibson (2001), Tracey *et al.* (2001), Riggs and Enochs (1990), Bandura (2001), Cassidy and Eachus (2002) and Sugar (2002) have suggested that self-efficacy, by itself, will influence actual performance and practices.

According to the Bandura's theory, there are two dimensions of expectancies of behavior; efficacy beliefs and outcome expectation. Efficacy belief is the feelings of confidence in performing certain task. Outcome expectation was defined as the belief about the consequences that action will produce. Furthermore, other researchers such as Gibson and Dembo (1984) also supported the concept. Given those two dimensions, this study hypothesized that CTE which includes teacher's personal evaluation on their own capability to use computer for teaching (efficacy beliefs) and learning and personal beliefs in using computer as an effective teaching method to improve student's motivation and performance in learning (outcome expectation) have impact on BL use.

H2. CTE will have a significant influence on BL.

School Environment

In this study, school environment refers to the support from administrators, such as non-academic staff, principal and senior assistants and technical support like facility availabilities when adopting computer in teaching and learning process. The study has hypothesized that the higher the support from school environment, the higher the use of computer in teaching and learning. In Goldstein and Ford's (2002) model, the working environment acted as important variable towards actual outcomes. ChanLin, *et al.* (2006) and ChanLin (2007) noted that the school environment play important role in the use of computer in teaching and learning. Based the above statement, the following hypothesis was developed.

H3. SE will have a significant influence on BL.

METHOD

Research Design

This study intends to understanding BL acceptance among teaching in teaching and learning. Data were collected through using a survey questionnaire comprising questions on demographics and multiple items for each variable in the research model. The survey question composed of 4 constructs. (BL use, school environment, computer attitudes and computer teaching efficacy).

All the participated teachers need to respond to the four point Likert scale questionnaire which consists from strongly agree (4), slightly agree, (3), slightly disagree (2) and strongly disagree (1).

Methodologically, analyses were conducted using AMOS 17 and the usual steps for conducting structural equation modelling (SEM) approach were employed to test the research model with latent variables against the observed data which has the ability to explain relationships among four variables in this study: computer attitudes (CA), computer teaching efficacy (CTE), school environment (SE) and BL use (BL). From the literature, SEM is used widely to predict and explain the determinants of users' acceptance regarding the acceptance of technology in educational settings (Luan & Teo, 2009; Wong *et al.*, 2013).

ANALYSIS AND RESULTS

In this study, two phases analysis have been carried out. A total of 98 teachers in Malaysia involved in this study. The first phase revealed the preliminary analysis which examined the descriptive statistics of the measurement items, and assessed the reliability and validity of the measure used in this study. This was to ensure the data adequate for structural equation modelling testing. For second phase, assessments on the contributions and significance of the latent variables against the observed data and explain its variance with regard to the dependent variable.

Preliminary Analysis

A descriptive analysis was preliminarily carried out on variables involved. Computer attitudes, computer teaching efficacy, school environment and BL use have been identified for their mean and standard deviation (Table 1). From the results, the lowest mean is 2.46 and it is higher than the midpoint score of the data (2.5). Moreover, skew and kurtosis indexed have shown that the data is normal for the analysis of structural equation modelling (Kline, 2005).

Table 1. Descriptive statistics of the study constructs

Construct	Mean	Standard deviation	Skewness	Kurtosis
Computer attitudes	3.63	.48	-1.20	1.12
Computer teaching efficacy	2.12	.66	.02	-.58
School environment	2.37	.94	-.12	-.01
BL use	2.46	.72	-1.09	-1.17

Analysis of Cronbach’s alpha was carried out to assess the composite reliability (CR). From the analysis, it proven that all variables loaded accordingly and the index measurement within the acceptable range (0.53 to 0.79) (Table 2).

Table 2. Results for the measurement model

Latent Variable	Item	Factor (>.60)*	Loading	Average Variance Extracted (>.50)*	Variance (= or >.70)*	Composite Reliability (= or >.70)*	
Computer Teaching Efficacy	CTE1	.821		.59		.532	
	CTE2	.798					
	CTE3	.672					
Computer Attitudes	CA1	.811	.62			.571	
	CA2	.781					
	CA3	.772					
School Environment	SE1	.691	.56			.793	
	SE2	.835					
	SE3	.722					
BL Use	BL1	.618	.57			.743	
	BL2	.818					
	BL3	.811					

^a AVE: Average Variance Extracted is computed by adding the squared factor loadings divided by number of factors.

^b Composite Reliability = $(\sum \lambda^2) / (\sum \lambda^2) + (\sum (1 - \lambda^2))$.

^c This value was fixed at 1.00 in the model for identification purposes.

*Indicates an acceptance level or validity.

** $p < .01$.

Based on above table, the results of AVE indexes are suitable for testing structural equation modelling as it is around 0.50.

Hypothesis Testing

Table 3 shows parameter estimates for the significant hypothesized paths. All hypotheses were significant according to the collected data on the relationship between computer attitudes, computer teaching efficacy and school environment toward BL use among practising teachers in Malaysia. Computer teaching efficacy was a significant influence on BL use ($\beta=.19, p<.01$) and computer attitudes has a significant influence on BL use ($\beta=.22 p<.01$). Finally, BL use was found to be influenced by school environment ($\beta=.63, p<.01$).

Table 3. Results of Hypothesis testing

Hypothesis	Relationship	P. C	Finding
H1	CA→BL	0.11**	Supported
H2	CTE→BL	0.18**	Supported
H3	SE→BL	0.60**	Supported

* $p < .05$; ** $p < .01$.

Computer attitudes variable has been indicated as the important factor which influence the use of BL among teachers. Based on the above results, R^2 of the computer attitudes is 0.11. Having that, it proven that computer

attitudes variable contributed and explained 11 percent of the variance in the BL use among practicing teachers in Malaysia.

BL use was also significantly determined by computer teaching efficacy and school environment with 18 percent ($R^2 = 0.18$) and 60 ($R^2 = 0.60$) percent respectively. Thus, it has contended that school environment is the most important factor influencing the use of BL in Malaysian schools.

Overall, the combined effects of computer attitudes, computer teaching efficacy and school environment explained 55.9% of the variance of BL use.

DISCUSSION AND IMPLICATIONS

The findings of the study have offered some vital implications in the context of educational technologies especially related to the use of technologies in teaching and learning among practicing teachers.

As anticipated, computer attitudes, computer teaching efficacy and school environment have direct effects towards the levels of integration of BL use in teaching and learning. Together, the variables in the research model in this study explained 55.9% of the variance in BL use among teachers towards BL use in teaching and learning. Overall, the findings have supported existing theories and assumptions that those selected exogenous and endogenous variables affected the BL use among them. Using structural equation modelling, data also indicated that the resulting model was an adequate fit to the observed relationships among the factors that influenced teachers in BL use in teaching and learning.

From the results, it has been corroborated that computer attitudes have positively influenced the use of computer among teachers. Therefore, it goes to show that computer attitude has an important role to play in influencing teachers' use of computers. The finding is in line with previous findings in Western settings. Indeed, from the literature, it appears that many technology studies, conducted in Malaysia setting, have highlighted the importance of computer attitudes in the use of technology (Teo, 2009; Wong, et al., 2013; Wong, et al., 2014; Wong, et al., 2015). Henceforth, in this regard, the Ministry of Education and the related government departments should do more in terms of encouraging positive computer attitudes among practising educators. Furthermore, based on previous findings and the results of this study have indicated that computer attitudes have significant impact on teachers' use of computer in teaching and learning, schools should provide training, funding and support required for this process. By strengthening staff training in technologies, schools can help encourage more positive attitudes toward computers, especially to reduce teachers' anxiety towards computers in general. The school boards of management should ensure that teacher education technology training program to be a part of their yearly activities.

It was also conclusively reported that school environment has very strong impacts on BL use. This is consistent with previous research by ChanLin, et al. (2006) and ChanLin (2007). The significance of school environment in enhancing the use of computer in teaching and learning could be due to the fact that teachers need administrative and technical support to encourage them to use the computer. Teachers need strong and enthusiastic leadership from principal in order to achieve higher confidence and belief in the use of computers. Technical support is vital when teachers are having difficulties in operating the computer based technologies equipment. Having knowledgeable people and willingness to answer questions are critical in overcoming the obstacles of using computer. In the Malaysian schools, especially in the rural areas, lack of availability of computers and software, and incompatibility between the software and hardware are very common situations. The government should inject more financial support and attention to rural schools which with intention to minimize the digital divide between the urban and rural schools. Training for principals is vital in ensuring that they are conscious of the importance of computer in teaching and learning. Through training, they would be able to know how to encourage (giving coaching, feedbacks and leading) teachers to use computers. School districts should look for different funding resources to make computer technologies available for each teacher and in each classroom. Principals or headmasters should give motivation and support to their staff and encourage them to use computers although at the initial level it could be very difficult.

LIMITATIONS OF THE STUDY

Although care has been taken to ensure that the methodology in this study is sound, there are limitations. It is important to state the limitations of the study to frame the above discussions, recommendations and conclusion within its proper context and perspective.

The total numbers of participated teachers in the study were 98. Hence, the findings might not adequately reflect the perceptions of the whole population of Malaysian teachers. Secondly, the questionnaire used in this study

may not be able to measure all aspects for the variables concerned. Finally, this study is the timeliness of the data and finding process. At the time of this writing, the data was collected more than a year old. Thus, during this period of time, there may have been some changes in syllabi and curricula in teacher educational training program. However, the main findings of this study will remain true regardless of the aforementioned changes. In the area of inquiries on technology integration among teachers, there is always ample room for additional research. Indeed, more studies should be carried out based on larger sample, so that the results can be more generalized as a whole. Since technology will continue to grow and develop rapidly, a replication of this study might be conducted periodically in order to examine education technology trends. Thus, teacher educational programs would be able to update courses and provide appropriate knowledge and skills for teachers.

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