DETERMINANTS OF THEORY TECHNOLOGY OF ACCEPTANCE MODEL (TAM) IN MEASURING EDUCATORS' CONTINUANCE INTENTION OF LEARNING MANAGEMENT SYSTEM (LMS)

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ABSTRACT

The purpose of the study was to examine the individual context in terms of educators' continuance intention of using Learning Management System (LMS). Technology Acceptance Model (TAM), as a supportive framework is used to measure the influence of the educators' experience towards determinant of Information System (IS) continuance intention for using LMS services. This study was conducted at the University Teknologi Mara (UiTM) among educators. The stratified sampling method was used in sample selection for this study. Survey data collected from 69 respondents were examined using Statistical Package for the Social Sciences Version 21 (SPSS 21). The cross sectional data were collected through a survey and the data analyzed by means of factor analysis, correlation and multiple regression analysis. The findings indicate that perceived usefulness and perceived ease of use were significantly direct determinant of users' continuance intention.

INTRODUCTION

Currently, with the development of the World Wide Web transformation, e-learning system provides many benefits to the individuals and organizations (Alrawashdeh, Muhairat & Alqatawnah, 2012). E-learning system is an emerging technology in many Malaysian Higher Education Institutions (HEIs). Current internet technology in higher education such as student portal, learning management system (LMS), virtual learning system (VLE) and course management system (CMS) has brought e-learning system to the new era. Students are able to take advantage of the strengths of the LMS for the purpose of learning activities. Besides, it also allows educator to access materials from anywhere at any time, thus has overcome many challenges faced by traditional method.

Based on literature survey, previous studies on e-learning system in Malaysian HEIs focus more on students' acceptance (Lim Chiu Yiong, Sam, & Wah, 2008; Masrom, 2007; Ramayah, Ahmad, & Lo, 2010) and adoption (Haron & Sahar, 2010; Hilmi, Pawanchik, & Mustapha, 2012) of e-learning as a learning tool. However, Ramayah et al. (2010) noted that in Malaysian HEIs, measurement of LMS implementations' success are users' continuance of usage of the facility for research and teaching and learning purposes. Thus, the success of LMS depends not only on students' intent to continue using the LMS, but it also depends very much on the acceptance of the educator and their willingness to make e-learning as a culture (Islam, 2011; Raja Hussain & Sulaiman, 2011). Nevertheless, there are very limited studies that touch on the post-adoption stage where educators' decide either to continue or discontinue their usage of an e-learning system (Islam, 2012; Mouakket & Bettayeb, 2015). Thus, this study established that very few studies have been conducted on educators' continuance intention to the use of LMS in Malaysia HEIs.

Therefore, this study aims to determine the factors that measure continuance of intention of using LMS by educator for teaching and learning activities. The findings of this study will fill the literature gap on educators' continuance intention of using LMS. This study employed using two particular beliefs from the theory of Technology Acceptance Model (TAM) in Malaysian public university context.

THEORETICAL FOUNDATIONS

This study is constructed based on two particular beliefs of TAM theory namely; perceived usefulness (PU) and perceived ease of use (PEOU). This study adopted the TAM model to evaluate the educators' continuance intention to use of LMS. Several scholars used the PU and PEOU to measure users' continuance intention to use an information system in the different context. For example it is the study by Hamid et al. (2016) which measures the effect of perceived usefulness and perceived ease of use on continuance intention to use e-government system among government school teachers. Meanwhile, Wangpipatwong et al. (2008) also investigates the factors that influence the citizen's continuance intention to use e-government websites by using TAM theory with computer self-efficacy as an additional factor. Therefore, this study aims to evaluate the independent variable of TAM; perceived usefulness and perceived ease of use significantly influence the dependent variable; the IS continuance intention. The framework for this research is given in Figure 1.
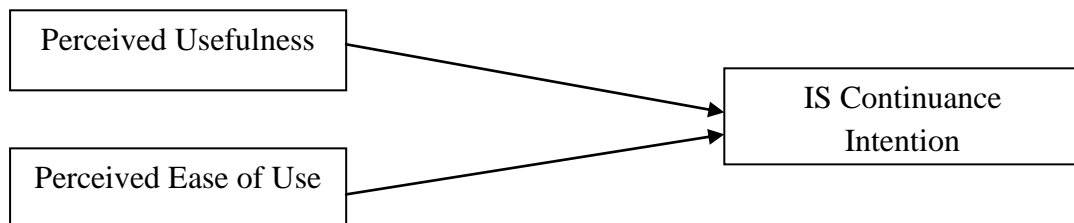

Figure 1
Research Model

In the next section, it is certainly recommendable to discuss on the theory that can be used as a guide to establish the theoretical model. In this study, the Technology Acceptance Model (TAM) (Davis, 1989) has been widely applied in the analysis of the use of technology.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) (Davis, 1989) was originally developed from the Theory of Reasoned Action (Fishbein & Ajzen, 1975). Davis (1989) developed TAM as a theoretical basis to provide an explanation of the determinants human computer usage behaviour that is general directly from generic TRA (Fishbein & Ajzen 1975). TAM theory is considered as one of the most influential and commonly employed theories for explaining an individual's acceptance of information technology system (Lee et al. 2003). The basis of TAM is that people behavioral intention to accept and actually use a certain technology is determined by two constructs namely; perceived usefulness and perceived ease of use.

Perceived Usefulness

Perceived Usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis 1989, p.320). Moreover, Davis further explains usefulness as "the degree to which the application which contributes to increased user performance took less time to complete the necessary tasks, producing the high-quality work products, etc." (p.318). People incline to use or not to use an application to date. In addition, they also trust it will give advantage to them to execute their duties better (Davis et al., 1989). In the context of this study, perceived usefulness is referred to the user's subjective probability that using a specific application will increase a person's performance within an organizational context. Past studies found the relationship between perceived usefulness and IS continuance intention was significant (Al-Maghrabi, Dennis, Vaux Halliday & BinAli, 2011; Shiau, Li & Shih, 2011).

Perceived Ease of Use

Perceived Ease of Use is the degree to which person believes that using a particular system would be free from effort (Davis, 1989). Davis explained that the application is acceptable to users and easy to use. This variable is measured on the information system (IS) with the features flexible, clear and easy to understand, easy to master, easy to learn and also easy to control (Davis, 1989). In the context of this study, perceived ease of use refers to the degree to which computer learning management systems use is relatively easy to use and understand. Studies by Wangpipatwong, Chutimaskul and Papasratorn (2008) and Hong, Thong, and Tam (2006), indicate that the relationship between perceived ease of use and IS continuance intention are significant.

IS Continuance Intention

Continuance Intention is defined as "users" intention to continue using the information system (Bhattacherjee, 2001b). From the past researches, the IS continuance model has been successfully used to explain the factors leading to continued use of information system (IS) in areas such as e-learning, mobile data service, e-government, e-commerce, Facebook and online community (Limayem & Cheung, 2008; Kim, 2010; Jin et al., 2010; Alruwaie, 2012; Li & Shi, 2012; and Praveena & Thomas, 2013). In the context of this study, IS continuance intention is referring to the user intention to continue using the learning management system.

HYPOTHESIS DEVELOPMENT

Based on the literature review discussed in this study, a total of two hypotheses statements were constructed to test the relationship for each variables that have been theorized. The formulated hypotheses for this study are listed as follow:

H1:   Perceived usefulness (PU) will have a positive and significant influence on the IS continuance intention (CI) of LMS usage.
H2:   Perceived ease of use (PEOU) will have a positive and significant influence on the IS continuance intention (CI) of LMS usage.

RESEARCH METHODOLOGY

Data were collected from Universiti Teknologi Mara (UiTM) via distributed questionnaires by hand and through emails. In this study, UiTM was chosen based on the large sample of educators at this university among others public universities in Malaysia. The stratified sampling method was used in sample selection for this study. Survey questionnaires were distributed to randomly selected educators with different faculty, school or department. The unit of analysis for this study was the individual in which the data were collected from each educator. A sample size of 100 educators was chosen at random for this study and only 69 questionnaires were returned and successfully collected for further analysis. However, 31 questionnaires were not included from the subsequent data analysis because incomplete response, inappropriate respondent answered the questionnaire and a lot of missing value. This is in line with the recommendation by Hair et al., (2010) that the sample size for this study is normal using the maximum chance criterion in situations with overall samples less than 100 or the group sizes under 20.

RESULTS AND DISCUSSION

This section presents the results and findings.

Overview of data gathered

A total of 100 questionnaires were distributed among sampled population and only 69 questionnaires were completed and successfully collected. Therefore, the response rate for this study is 69%. In this study, data were analyzed using the Statistical

Package for the Social Sciences Version 21 (SPSS 21) and the subsequent data analysis were undertaken using statistical approach i.e. reliability analysis, factor analysis, correlation analysis and multiple regression.

Profile respondents

As shown in Table 1 below, 21.7% of respondents were male and 78.3% were female. Most of respondents were between 21 to 60 years old. In terms of marital status, 13% of respondents are single and 87% are married. There are three main races took part in this study. These include Malay (87%), Chinese (11.6%) and Indian (1.4%). In the level of education, the respondents are master degree holders are relatively large percentage.   This group of respondents consists of 75.4% and the doctoral degree which is approximately 24.6%. In this aspect of academic rank, three academic rank groups participated in this survey which is Associate Professor (5.8%), Senior Lecturer (42%) and Lecturer (52.2%). As may be seen from Table 1, the teaching experiences consist of less than 1 year, 1-10 years, 11-20 years, 21-30 years, 31-40 years and 41 years and above. Out of teaching experiences, the large proportion of the respondents that used LMS in their teaching and learning activities is among 11-20 years, which is 49.3%. The results also indicate that educators teaching experiences are less than 1 year (1.4%), 1-10 years (36.2%), 21-30 years (11.6%), and 31-40 years (1.4%).With regards to the respondents' use the LMS, the analysis revealed that there are a total of 69 respondents (69%) are currently using the LMS. The majority of the respondents are using LMS once in a week, which is 29%. These are then followed by the using LMS once in a month (18.8%), once in a day (17.4%), once in a fortnight (14.5%), and others (11.6%) and lastly once in a semester (8.7%).

Table 1
Profile of respondents

Demographic	Frequency	Percentage
Respondent gender		
Male	15	21.7%
Female	54	78.3%
Respondent age		
21-30 years	10	14.5%
31-40 years	29	42%
41-50 years	23	33.3%
51-60 years	7	10.1%
61 above	0	0%
Marital status		
Single	9	13%
Married	60	87%
Widow/widower	0	0%
Race		
Malay	60	87%
Chinese	8	11.6%
Indian	1	1.4%
Others	0	0%

Education		
Bachelor	0	0%
Master	52	75.4%
Doctoral	17	24.6%
Academic rank		
Professor	0	0%
Associate Professor	4	5.8%
Senior Lecturer	29	42%
Lecturer	36	52.2%
Tutor	0	0%
Teaching experience		
Less than 1 year	1	1.4%
1-10 years	25	36.2%
11-20 years	34	49.3%
21-30 years	8	11.6%
31-40 years	1	1.4%
41 years and above	0	0%
Use LMS		
Yes	69	69%
No	0	0%
Often use		
Once in a semester	6	8.7%
Once in a month	13	18.8%
Once in a fortnight	10	14.5%
Once in a week	20	29%
Once in a day	12	17.4%
Others	8	11.6%

Factor and Reliability Analysis

The factor analysis using the varimax rotation was conducted to determine variance explained and to extract the construct variables. The items loaded at 0.5 as threshold of primary loading or better with their corresponding constructs, which is considered very significant. The result of the factor analysis revealed three construct. Those results had the factor loadings that ranged from 0.589 to 0.914 as shown in Table 2. Kaiser-Meyer-Olkin (KMO) values presented for perceived usefulness, perceived ease of use and IS continuance intention were 0.797, 0.827 and 0.762 as a result. All the result findings were larger than the recommend value of 0.70 (Hair, Anderson, Tatham and Black, 1998).

Besides that, the questionnaire was validated for reliability by using Cronbach Alpha. The results indicated that Cronbach Alpha reliability for the constructs ranged from 0.796 to 0.916 greater than 0.70 thus the measurement of the variables are valid and reliable (Sekaran and Bougie, 2010).

Table 2
Result of Factor Analysis of the construct

Items	PU	PEOU	CI	Kaiser-Meyer-Olkin (KMO)	α
PU1	0.838			0.797	0.880
PU2	0.689				
PU3	0.794				
PU4	0.830				
PU5	0.825				
PU6	0.789				
PEOU1		0.865		0.827	0.916
PEOU2		0.878			
PEOU3		0.899			
PEOU4		0.834			
PEOU5		0.897			
CI1			0.914	0.762	0.796
CI2			0.589		
CI3			0.839		
CI4			0.900		

All factors loading are significant at P-value < 0.000

Correlation Analysis

In this study, the Pearson Correlation was conducted to determine the strength and direction of the relationship between independent variables and dependent variables. Hair et al. (1998) indicated that the correlation coefficient (r-value) between each pair of independent variables were below 0.90. If the correlation values exceed 0.90, it may be suspected to show multicollinearity problems (Hair et al., 1998). Table 3 shows the result for value coefficients are 0.574 (IS continuance intention with perceived usefulness), 0.495 (IS continuance intention with perceived ease of use) and 0.528 (perceived usefulness with perceived ease of use) which is smaller than 0.90. Therefore, there are no crucial multicollinearity problems in this study.

Table 3
Inter-correlation between variables

	IS continuance Intention	Perceived usefulness	Perceived ease of use
IS continuance Intention	-		
Perceived usefulness	0.574**	-	
Perceived ease of use	0.495**	0.528**	-

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

Multiple Regression Analysis

The multiple regression analysis was conducted to determine the relationship between independent variables (perceived usefulness and perceived ease of use) with the dependent variable (IS continuance intention). The Table 4 presents the result of multiple regression analysis. It shows that the R^2 value of regression model indicates that all the variables predict 36% of the variance in IS continuance intention and 38% can be predicted by other variables. As shown in Table 3, perceived usefulness (PU) significantly predicted IS continuance intention (t=3.803, p<0.01); therefore, H1 was supported. Second, perceived ease of use (PEOU) significantly predict IS continuance intention (t=2.338, p<0.05), providing support for H2. Therefore, the two hypotheses (H1 and H2) representing the relationship among the main constructs (PU and PEOU) to IS continuance intention were accepted in this study.

Table 4
Result of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.523	.606		2.512	.014
Perceived usefulness	.435	.114	.434	3.803	.000*
Perceived ease of use	.263	.112	.267	2.338	.022**

Notes:*p<0.01, **p<0.05, ***<0.10
Adjusted R^2:0.362, F-statistics =20.312, Sig at 0.000

DISCUSSION

The findings of this study, indicates that the variable of perceived usefulness and perceived ease of use predicting the continuance intention of using the learning management system (LMS) at the UiTM. The results of the multiple regression analysis from this study revealed that the educators' perceived usefulness and perceived ease of use was positively related to the continuance intention to use LMS. This finding is consistent with the previous study (Hamid, et al., 2016; Bahruni, Mat Yusof, & Abdul Rahim, 2015; Wangpipatwong, et al., 2008). Therefore, the Table 5 shows the results of hypotheses in this study were supported.

Table 5
Summary of results of hypotheses

	Hypotheses	Decisions
H1	Perceived usefulness (PU) will have a positive and significant influence on the IS continuance intention (CI) of LMS usage.	Supported
H2	Perceived ease of use (PEOU) will have a positive and significant influence on the IS continuance intention (CI) of LMS usage.	Supported

CONCLUSION AND FUTURE RECOMMENDATION

The study focuses on the determinants of theory of technology acceptance model (TAM) in measuring educators' continuance intention using LMS in Malaysia public universities, to verify the objectives of this study. This study has several limitations. First, the sample was collected from one public university in Malaysia which is Universiti Teknologi Mara (UiTM). More studies can be conducted in different public universities to improve the generalization of the findings. Second, the study only uses the two variables to measure the educators' continuance intention; future studies may assess more variables to examine the prospect of utilizing LMS in public universities context. In addition, it should be interesting to find out the educators' perceived satisfaction on the LMS usage. Finally, the future research might also utilize a more established integration model to examine the factors that measuring continuance intention of LMS by educator.

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