A PILOT STUDY ON FACTORS AFFECTING THE USE OF *FROG* VIRTUAL LEARNING ENVIRONMENT

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Abstract

Many studies (Al-alak & Alnawas, 2011; Ana Haziqah, 2014; Ferdousi, 2009; Goh, 2011; Mbengo, 2014; Nurul, 2014) have been carried out to study factors that affect the successful implementation of virtual learning based on Technology Acceptance Model (TAM). The Auditor-General's 2013 report (National Audit Department, 2014) has shown that the implementation of virtual learning using *Frog* Virtual Learning Environment (*Frog* VLE) among schools in Malaysia is less than 5%. It is the interest of this research to study the factors that influence the use of *Frog* VLE among lecturers in the Teacher Education Institute since not many such studies have been carried out in Malaysia (Ana Haziqah, 2014; Goh, 2011; Ministry of Finance, 2014, pp. 216; Nurul, 2014). The present study is a pilot study involving 32 lecturers in a Teacher Education Institute in Sarawak. Data was collected using survey questions based on TAM. The findings showed that attitude is the main factor that influenced the use of *Frog* VLE among the lecturers. Other minor factors affecting the use are the perceived usefulness and perceived ease of use of the system. Factors like technological complexity, facilitating conditions and self-efficacy do not have direct significant influence on the use of the system by the users. In conclusion, implications of the findings and suggestions for further research are put forward.

Keywords: Virtual Learning Environment (VLE), Technology Acceptance Model (TAM), lecturers, teacher education institute

Abstrak

Kajian berkaitan faktor yang mempengaruhi kejayaan pelaksanaan pembelajaran secara maya berpandukan Technology Acceptance Model (TAM) telah banyak dijalankan (Al-alak & Alnawas, 2011; Ana Haziqah, 2014; Ferdousi, 2009; Goh, 2011; Mbengo, 2014; Nurul, 2014). Laporan Audit Negara 2013 (Kementerian Audit Negara, 2014) melaporkan pelaksanaan pembelajaran maya menggunakan *Frog* VLE dalam sekolah di Malaysia adalah kurang daripada 5%. Kajian ini bertujuan untuk mengkaji faktor yang mempengaruhi penggunaan *Frog* VLE dalam kalangan pensyarah institut pendidikan guru memandangkan tidak banyak kajian sedemikian telah dijalankan (Ana Haziqah, 2014; Goh, 2011; Ministry of Finance, 2014, pp. 216; Nurul, 2014). Artikel ini merupakan laporan kajian rintis yang melibatkan seramai 32 orang pensyarah di sebuah institut pendidikan guru di Sarawak. Soal-selidik berdasarkan TAM digunakan untuk mengumpul data. Hasil kajian menunjukkan faktor utama yang mempengaruhi penggunaan *Frog* VLE dalam kalangan pensyarah ialah sikap. Faktor minor lain yang turut mempengaruhi penggunaan *Frog* VLE ialah *perceived usefulness* dan *perceived ease of use* sistem tersebut. Faktor seperti teknologi yang kompleks, pemudahcaraan dan keupayaan-kendiri tidak mempengaruhi penggunaan *Frog* VLE. Secara kesimpulan, implikasi dapatan kajian ini dan cadangan kajian lanjutan dikemukakan.

Kata kunci: Pembelajaran maya, Technology Acceptance Model (TAM), pensyarah, institut pendidikan guru

Introduction

Current advances in information communication technology (ICT) have provided new tools for instructors to improve their teaching. The conventional teaching approaches have changed from teacher-centered to student-centered learning at any time, any place and anywhere. This is usually coined as e-learning, which represents an innovative shift in the field of learning. It is a web-based communications platform that enables rapid access to specific knowledge and information without limitation of time and place (van Raaij & Schepers, 2008). E-learning is referred to as virtual learning in this research. The Ministry of Education (MOE) Malaysia, launched the Malaysia Education Blueprint 2013-2025 recently and ICT in education is one of the agendas stated in the blueprint. Among the

measures stated to be taken for ICT in education, two of the measures of interest and relevance to this research are:

1. Training all teachers to embed ICT in teaching and learning in order to support student learning

2. Piloting ICT innovations for delivery such as distance-learning and self-paced learning before they are being implemented nationwide.

The 1BestariNet Service Project (1BestariNet) was an initiative undertaken by the Ministry of Education Malaysia (MOE) and carried out in partnership with YTL Communications Sdn. Bhd. to replace and enhance ICT connectivity in schools (National Audit Department, 2014). It was an enhancement to the SchoolNet service with emphasis on end to end solutions (E2E) network services together with Virtual Learning Environment (VLE). Under 1BestariNet, 10,000 schools in Malaysia were equipped with high-speed 4G Internet access and a virtual learning platform, providing high-speed internet connectivity and access to a world-class Integrated Learning Solution. 1BestariNet served as a major catalyst for internet penetration in Malaysia as well as the projected increase in national income. Under 1BestariNet, schools will be equipped with an integrated solution allowing teaching, learning, collaboration, and administrative functions to take place through the Internet-based Virtual Learning Environment (*Frog* VLE), which can be accessed in schools and from anywhere else with an Internet connection (a 4G Internet).

Problem Background

The Auditor-General's 2013 report (National Audit Department, 2014) on the performance and management of 1BestariNet has found some weaknesses. One of the weaknesses relevant to this research is that "VLE usage by teachers, students and parents was very low, that is, between 0.01% and 4.69%" (Kementerian Kewangan Malaysia, 2014, p. 213). This finding indicates that the returns of the money invested in 1BestariNet are not as expected. One of the measures that have been suggested to improve this weakness and to get the best value for the money invested by the government is:

> MOE should issue a guideline for VLE in schools so that VLE could be optimised by teachers, students and parents. The approaches relating to teaching and learning should be explained so that the schools could implement VLE effectively. Besides that, a pioneer project should be implemented to ensure the effectiveness of the outcome from this initiative (National Audit Department, 2014, p. 72).

The Ministry of Education Malaysia has been working hard to ensure that teachers in school are using *Frog* VLE (Ministry of Finance, 2014). There have been studies on implementation of *Frog* VLE in Malaysian schools (Ana Haziqah, 2014; Goh, 2011; Nurul, 2014) but there have been relatively few studies on its implementation in Teacher Education Institutes (TEI). This is due to the fact that emphasis on its implementation has been focused on schools but not TEI (refer "Maklum Balas Ke Atas Laporan Ketua Audit Negara Siri 3 Tahun 2013", Ministry of Finance, 2014, p. 216). As TEI lecturers are student teachers' instructors, they should play an active role in encouraging students to use *Frog* VLE. This is a strong rationale why instructors, as education enablers, should be exposed to how to integrate *Frog* VLE into their teaching and learning activities. It is important to study factors affecting the use of *Frog* VLE among the lecturers in TEI so that they can start to inculcate a positive attitude and culture towards the use of *Frog* VLE among student teachers before they are posted to schools upon their graduation. As mentioned earlier, there have been studies (Ana Haziqah, 2014; Goh, 2011; Nurul, 2014) on the implementation of *Frog* VLE in school but relatively few studies have been carried out at the TEI level. The present study aimed to fill this gap in research on TEI implementation of *Frog* VLE in Malaysia.

Research Motivations
Many factors can contribute to the successful implementation of virtual learning. These include instructor characteristics, student characteristics, ICT and institutional support (Selim, 2007; Volery & Lord, 2000). Instructors who are equiped with the necessary skills and knowledge play an important role to ensure the successful implementation of virtual learning (Zainon Othman, 2008). Many of the studies carried out to study instructors' attitudes towards e-learning indicated that instructors play a key role in either conventional face-to-face classroom or virtual learning environment (Piccoli, Ahmad & Ives, 2001; Smeets, 2005; Sun, Tsai, Finger, Chen & Yeh, 2008; Webster & Hackley, 1997). It has been reported that the willingness of instructors to implement technology is a problem they faced with themselves like fear (Trucano, 2005), resistance to change (Ertmer, Ottenbreit-Leftwich & York, 2006), lack of technological proficiency (Mundy, Kupczynski & Kee, 2012) or lack of confidence (Ertmer, Ottenbreit-Leftwich & York, 2007; Trucano, 2005). Based on Technology Acceptance Model (TAM), the major determinants of utilizing a system is the perceived usefulness and the perceived ease of use. Ana Haziqah (2014) has carried out a research to study teachers' readiness in Malaysian schools to use *Frog* VLE based on TAM. A teacher's perception towards *Frog* will indicate the teacher's readiness and acceptance to use the application. Since no such research has been carried out from the context of Teacher Education Institute lecturers' perception towards the use of *Frog* based on TAM, it is the interest of this research to carry out the study.

Research Questions
This study addressed the following research questions:

1. What are the factors that affect lecturers' intention to use *Frog* VLE?

2. Do the factors that affect lecturers' intention to use *Frog* VLE, namely, perceived usefulness, perceived ease of use, attitude toward use, behavioral intention to use, actual system usage, technological complexity, facilitating conditions, and self-efficacy, have significant influence on each other?

Significance of this Study

The findings of this study will benefit the Ministry of Education (MOE) Malaysia since a huge sum of money has been invested in the implementation of *Frog* VLE. The findings obtained can be useful input for their effort to improve the weaknesses identified by the Auditor-General's 2013 report (National Audit Department, 2014) described in this research. Besides, this research is also significant for TEI lecturers. The findings from this study can help to create awareness regarding the factors that determine their willingness to use *Frog* VLE. Identification of one's own weaknesses can help better prepare oneself to use the system.

Literature Review

The concepts of learning management system (LMS), web-based learning environments, internet-based learning environments, web platforms and e-learning environments are used synonymously with virtual learning environment (VLE). The Joint Information Systems Committee (JISC) (2002) defines virtual learning environments as: "the components in which learners and tutors participate in online interactions of various kinds, including online learning." The Joint Information Systems Committee contrasts the concept of virtual learning environment to the concept of managed learning environment (MLE), which is used to inclu de the whole range of computer-based information systems and procedures of higher education, including the virtual learning environment.

The Ministry of Education (MOE) Malaysia has taken the initiative to introduce VLE through *Frog* VLE. This is a service provided by YTL Communications Sdn. Bhd. through the 1BestariNet Service Project (1BestariNet, 2012). Students and teachers are provided with a virtual learning platform. They can access to resources and technology through *Frog* VLE. The platform intends to facilitate and make learning fun. Quality content is provided that integrate various applications at the same time connecting teachers and students through a learning community. The

system also enables parents to monitor their children's progress virtually. *Frog* VLE creates a different kind of learning environment that is easy to use, intuitive and fun. Users can create and share learning resources even though they do not have the knowledge or expertise. A learning community that is dynamic and interactive can exist in *Frog* VLE. The introduction of VLE has initiated many studies of which some will be reviewed in the following section.

Some researhers (Ana Haziqah, 2014; Nurul, 2014) have studied the factors affecting the acceptance and use of VLE based on Technology Acceptance Model (TAM). Generally, the findings of previous studies show that the main determinant of the instructors' (either lecturer or teacher) keenness to use VLE was indicated by how positive their responses are to the constructs of TAM such as perceived usefulness, perceived ease of use, attitude and behavioural intention to use (Ana Haziqah, 2014; Goh, 2011; Mbengo, 2014). Other factors besides TAM were also found to affect the use of VLE. Ferdousi (2009) found that resistance to change was the main factor that predicted instructors' intention to use e-learning systems. Al-alak and Alnawas (2011) have shown that factors like computer knowledge and management support also determine the use of VLE. In the research carried out by Nurul (2013), ICT infrastructure and motivation from the administrators were found to be the main challenges faced by teachers during the implementation of *Frog* VLE in schools in Malaysia. Most of the researches have used statistical methods like Multiple Linear Regression (MLR) (Ferdousi, 2009; Nurul, 2013), Ordinal Logistic Regression (OLR) (Ferdousi, 2009) and two-step structural equation modeling (Al-alak & Alnawas, 2011) to carry out data analysis. The present study aimed to investigate the factors that affect the acceptance and use of *Frog* VLE by lecturers of a Teacher Education Institute. Similar statistical analysis like linear regression can be used for analysis in this study. Both Ana Haziqah (2014) and Nurul (2014) have studied the use of *Frog* VLE by teachers in Malaysia's schools. This study will extend similar research to a Teacher Education Institute in Sarawak.

Technology Acceptance Model (TAM)

The Technology Acceptance Model was proposed by Davis (1989) to study the reason users accept or reject information technology and how to improve the acceptance. It was designed to help understand the causal relation between external variables of user's acceptance and the real use of computer. The two main determinants of TAM are:

1. Perceived usefulness (PU) - degree to which a person believes that the use of a particular system may improve his performance;

2. Facility of perceived use (PEOU) - degree to which a person believes that the use of an information system will be free of effort.

Other constructs of the model include attitude towards computer use (ATU), and behavioral intention to use (BIU) computers. PU and PEOU together lead to BIU, and it results in usage behavior that can determine actual system usage (SU).

In the present study, PU is to investigate the lecturer's beliefs as to whether *Frog* VLE can improve his performance, while PEOU investigates the degree to which a lecturer believes that the use of *Frog* VLE will be free of effort. These perspectives have been used to study Malaysian secondary school teachers' beliefs regarding the use of *Frog* by Ana Haziqah (2014). The perceived usefulness and perceived ease of use determine whether a user will use a technology. If he/she believes that the use will give positive results, then his/her intention to use the technology will be high (Aypay, Çelik, Aypay & Sever, 2012). This model (refer to Figure 1) is useful to describe the reasons for users not accepting a technology and the appropriate corrective measures that could be taken.

In addition, other constructs like Technological Complexity (TC), Computer Self-efficacy (CSE) and Facilitating Conditions (FC) were included to study other factors besides factors based on the conventional TAM that influence the use of *Frog* VLE. The notion TC as it is used by Timothy (2009, pp. 304-305) refers to whether users perceive technology as relatively difficult to understand and use. Computer Self-efficacy indicates one's judgment of his/her capabilities of organizing and completing courses of action required to achieve specific tasks (Bandura, 1977). Facilitating Conditions are environmental factors that affect one's desire to perform a task.
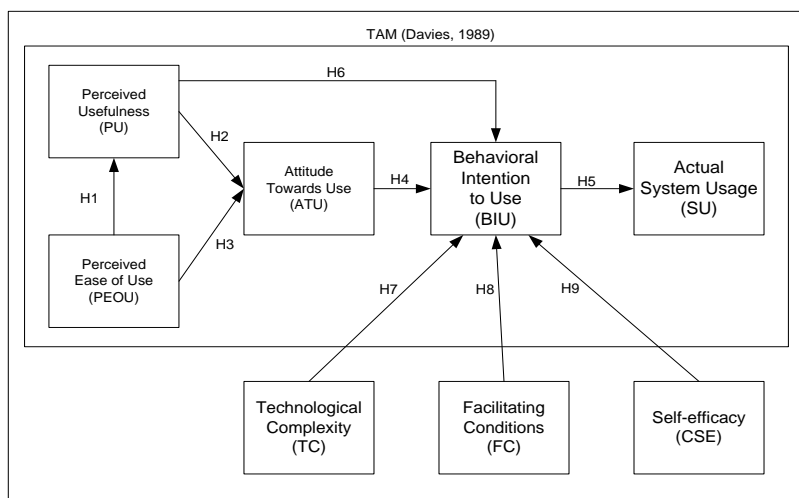

Figure 1. Technology Acceptance Model (TAM) with Three Additional Constructs

Research Model and Hypotheses

Based on the research model in Figure 1, the boxes represent the constructs which were measured as the factors that affect the lecturers' intention to use *Frog* VLE. The relationship that exists between the constructs shows a causal relationship schema and is thus used to formulate the hypotheses for this study, which will be geared towards addressing the second research question of this study.

H1: Perceived ease of use (PEOU) will have a significant influence on perceived usefulness (PU).

H2: Perceived usefulness (PU) will have a significant influence on attitude towards usage (ATU).

H3: Perceived ease of use (PEOU) will have a significant influence on attitude towards usage (ATU).

H4: Attitude towards usage (ATU) will have a significant influence on users' behavioural intention to use (BIU).

H5: Users' behavioural intention to use (BIU) will have a significant influence on actual system use (SU).

H6: Perceived usefulness (PU) will have a significant influence on users' behavioural intention to use (BIU).

H7: Technological Complexity (TC) will have a significant influence on users' behavioural intention to use (BIU).

H8: Facilitating Conditions (FC) will have a significant influence on users' behavioural intention to use (BIU).

H9: Self-efficacy (CSE) will have a significant influence on users' behavioural intention to use (BIU), of *Frog* VLE.

Method

Participants

The participants of this study were 32 (16 males, 16 females) lecturers from six different departments in a Teacher Education Institute in Sarawak. The mean age of the participants were 47.50 years (*SD* = 1.31). All of them have more than five years' experience of using computer in their workplace.

Instrument

The questionnaire used in this research was adapted from the questionnaire used in Juinn, Potamites and Lin's (2012), and Aypay, Çelik, Aypay and Sever's (2012) research. Juinn, Potamites and Lin (2012) studied factors that influence clients of banks in adopting online banking behavior in Taiwan whereas Aypay, Çelik, Aypay and Sever (2012) studied the level of technology acceptance of pre-service teachers in Turkey. In the present study, a total of 26 questions were constructed for the questionnaire and respondents were required to indicate their degree of agreement on a 5-point Likert scale, namely *1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4= Agree, 5= Strongly Disagree*. The questionnaire consists of two parts. The first part was for obtaining demographic information about the respondents. The second part consists of questions measuring the constructs of TAM model with the three additional constructs (Figure 1). The Cronbach's Alpha reliability coefficient for the present sample (N = 32) is .75, indicating that the instrument has moderately high reliability.

Data Analysis

The statistical software package SPSS for Windows (version 12.0) was used to carry out correlation analysis of the TAM model with the three additional constructs in this survey. Pearson correlation was computed to measure the linear correlation (dependency) between two variables X and $Y.$ It gives a value between +1 and −1 inclusive where 1 is total positive correlation, 0 is no correlation and −1 is total negative correlation. Besides correlation, linear regression analysis was also computed. It is a kind of structural equation modeling. Linear regression analysis is useful because it works well on small samples and can usually be solved quickly, even when there are many factors and variables.

Findings and Discussion

Demographic Information

The respondents for this study were 32 lecturers from different departments of a Teacher Education Institute in Sarawak who have attended the *Frog* VLE workshops. The workshops were conducted by two lecturers from the Department of Education Technology. The demographic information of the respondents is summarized in Table 1. The highest participating percentage of lecturers is in the 50-60 years age group (53.1%). This is followed by those in the 45-50 years age group (18.8%) and 41-45 years age group (12.5%). Around 93.7% of the lecturers have a masters degree and 65.6% used computer every day with 90% of them having more than 10 years of experience in using computer. However, their experience in using *Frog* VLE was less than 6 months and 90% of them have only attended one training session for using *Frog* VLE.

Table 1

Demographic Information

Variables	Characteristics	%
Gender	Male	50
	Female	50
Age (years)	31-35	9.4
	36-40	3.1
	41-45	12.5
	45-50	18.8
	50-60	53.1
Education	Degree	6.3
	Master	75
	PhD	15.6
Internet use frequency	Every day	65.6
	Almost every day	25.0
	Twice a week	4.0
	Twice a month	3.0
	Once every three-month	2.0
	Semi-annual	0.4
	Never	0.0
Experience of computer use	> 10 years	90
How long have you used *Frog* VLE?	< 6 months	100
How much training did you receive in using *Frog* VLE as a teaching tool?	1 training session	90

Factors that affect the use of *Frog* VLE among Lecturers

Descriptive statistics of TAM constructs (Table 2) show that lecturers strongly agreed ($M = 4.14$) that System Usage (SU) is the main factor that will determine their use of *Frog* VLE. This means that even though learning to use *Frog* VLE takes up too much of their time, they will still use *Frog* VLE. They also agree, in the ranking order of Computer Self-efficacy (CSE), Attitude Towards Computer Use (ATU), Facility of Perceived Use (PEOU), Perceived Usefulness (PU) and Facilitating Conditions (FC), are the other factors that will also determine their use of *Frog* VLE. The lecturers agreed ($M = 3.85$) that they could complete a task using *Frog* VLE if they could call on someone for help when they faced problems or if someone showed them how to do it first. They also agreed that positive attitude towards using the system is another factor that would determine their use of the system. Similarly, ease of use will also determine their use of *Frog* VLE. However, they disagreed ($M = 3.09$) that Behavioral Intention to Use (BIU), and strongly disagree ($M = 2.84$) that Technological Complexity (TC) will

determine their use of *Frog* VLE. They strongly disagreed (*M* = 2.84) that *Frog* VLE takes up a lot of their time to use or learn.

Table 2

Descriptive Statistics of Research Model Constructs

TAM Constructs	Mean	Std. Deviation	Ranking
System Usage (SU)	4.14	.53	1
Perceived Usefulness (PU)	3.70	.69	5
Facility of Perceived Use (PEOU)	3.71	.75	4
Attitude Towards Computer Use (ATU)	3.82	.72	3
Behavioral Intention to Use (BIU)	3.09	.67	7
Technological Complexity (TC)	2.84	.95	8
Facilitating Conditions (FC)	3.69	.86	6
Computer Self-efficacy (CSE)	3.85	.89	2

Relationship among the Factors

The computed correlation coefficients for the constructs are shown in Table 3. There is a significant moderate correlation for the influence of PEOU on PU (*r* = 0.49), PU on ATU (*r* = 0.62), PEOU on ATU (*r* = 0.69), BIU on SU (*r* = 0.60), PU on BIU (*r* = 0.67) and a strong correlation for the influence of ATU on BIU (*r* = 0.909) at 0.01 confidence level. On the other hand, there is a weak correlation for the influence of TC on BIU (*r* = 0.064), FC on BIU (*r* = 0.201) and CSE on BIU (*r* = 0.224) which is found to be not significant at 0.01 confidence level.

Table 3

Pearson Correlation Coefficient Research Model Construct

	PU	PEOU	ATU	BIU	SU	TC	FC	CSE
PU	1	.487**	.619**	.666**	.488**	.007	.227	.289
PEOU	.487**	1	.688**	.671**	.505**	-.135	.219	.153
ATU	.619**	.688**	1	.909**	.670**	.069	.098	.105
BIU	.666**	.671**	.909**	1	.599**	.064	.201	.224
SU	.488**	.505**	.670**	.599**	1	.349	.376*	.404*
TC	.007	-.135	.069	.064	.349	1	.585**	.561**
FC	.227	.219	.098	.201	.376*	.585**	1	.874**
CSE	.289	.153	.105	.224	.404*	.561**	.874**	1

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

Linear regression analysis was computed to show the level of influence of one construct over another based on the hypothesis. The results in Table 4 show that BIU is 82.6% influenced by ATU. Other constructs have a lower percentage of influence with ATU: ATU is 47.3% influenced by PEOU, BIU is 44.4% influenced by PU, ATU is 38.3% influenced by PU, SU is 35.8% influenced by BIU and PU is 23.7% influenced by PEOU. BIU is influenced very little by TC (0.40%), FC (4.00%) and CSE (5.00%). These initial data analysis for the pilot study based on correlation and linear regression analysis have the following findings for the nine hypotheses (summarized in Table 5). It can be concluded that attitude towards use (ATU) has the greatest influence on behavioural intention to use (BIU) *Frog* VLE among the lecturers in a Teacher Education Institute in Sarawak. Other factors that have minor direct or indirect influence on the use of *Frog* VLE were perceived usefulness (PU) and perceived ease of use (PEOU). Interestingly, the findings indicate that factors like technological complexity (TC), facilitating conditions (FC) and self-efficacy (CSE) were not the main inhibiting factors that deter the use of *Frog* VLE among the lecturers.

The analysis indicates that the lecturers have very positive intention (BIU) to use *Frog* VLE. Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) are related to one's believe to use technology (Ajzen & Fishbein, 1980). Since PEOU and PU have direct influence on ATU and indirect influence on intention of technology use (BIU), this implies that lecturers believe that using *Frog* VLE can help them in their teaching and they have more control over the knowledge transaction. This probably has influenced the lecturers to have positive intention to use *Frog* VLE. Perceived Ease of Use (PEOU) could also affect the intrinsic motivation of a person in using technology. According to Fagan, Neill and Wooldridge (2008), people with high intrinsic motivations towards using a technology could help them to set a positive mindset that the technology is easy to use. The low influence of technological complexity (TC), facilitating conditions (FC) and self-efficacy (CSE) towards the intention of using *Frog* VLE could imply that the lecturers have high intrinsic motivation in using *Frog* VLE which has helped them to overcome the difficulties of technological complexity, little facilitating conditions and low self-efficacy. Similar positive influence of PEOU, PU and ATU on the intention (BIU) to use technology have been reported in research carried out by Ferdousi, (2009), Al-alak and Alnawas (2011), Aypay (2012) and Mbengo (2014). However, Al-Busaidi and Al-Shihi and Al-Shihi (2010) have reported that TAM is not only influenced by an instructor's attitude towards technology use but also influenced by other factors from the organizational and technology perspective. The different results obtained concerning the influence of technological complexity (TC), facilitating conditions (FC) and self-efficacy (CSE) factors on the intention use of *Frog* VLE might be due to other factors which are not covered in this study.

Table 4

Linear Regression Analysis of Factors based on TAM affecting the use of Frog VLE

Influence of A → B	R-squared	% of influence	Sig.
PEOU → PU	.24	23.7	.005
PEOU → ATU	.47	47.3	.000
PU → ATU	.38	38.3	.000
BIU → SU	.36	35.8	.000
PU → BIU	.44	44.4	.000
ATU → BIU	.83	82.6	.000
TC → BIU	.004	0.40	.727
FC → BIU	.04	4.00	.271
CSE → BIU	.05	5.00	.271

Table 4 is directly related to the hypothesis shown in Table 5. Based on the results, hypothesis null for H_7, H_8 and H_9 are being accepted indicating that technological complexity (TC), facilitating conditions (FC) and self-efficacy (CSE) factors do not have significant influence on users' behavioural intention to use (BIU) *Frog* VLE. The rejection of hypothesis null for H_1 to H_6 indicate that:

- Perceived ease of use (PEOU) has a significant influence on perceived usefulness (PU) of *Frog* VLE,
- Perceived usefulness (PU) has a significant influence on attitude towards usage (ATU) of *Frog* VLE,
- Perceived ease of use (PEOU) has a significant influence on attitude towards usage (ATU) of *Frog* VLE,
- Attitude towards usage (ATU) has a significant influence on users' behavioural intention to use (BIU) *Frog* VLE,
- Users' behavioural intention to use (BIU) has a significant influence on actual system use (SU) of *Frog* VLE, and
- Perceived usefulness (PU) has a significant influence on users' behavioural intention to use (BIU) *Frog* VLE.

Table 5

Summary of Hypothesis Findings

	Hypothesis	Significance Level	H_0
H_1	Perceived ease of use (PEOU) will have a significant influence on perceived usefulness (PU).	.005	Reject
H_2	Perceived usefulness (PU) will have a significant influence on attitude towards usage (ATU).	.000	Reject
H_3	Perceived ease of use (PEOU) will have a significant influence on attitude towards usage (ATU).	.000	Reject
H_4	Attitude towards usage (ATU) will have a significant influence on users' behavioural intention to use (BIU).	.000	Reject
H_5	Users' behavioural intention to use (BIU) will have a significant influence on actual system use (SU).	.000	Reject
H_6	Perceived usefulness (PU) will have a significant influence on users' behavioural intention to use (BIU).	.000	Reject
H_7	Technological Complexity (TC) will have a significant influence on users' behavioural intention to use (BIU).	.727	Accept
H_8	Facilitating Conditions (FC) will have a significant influence on users' behavioural intention to use (BIU).	.271	Accept
H_9	Self-efficacy (CSE) will have a significant influence on users' behavioural intention to use (BIU), of *Frog* VLE.	.271	Accept

Conclusion

This research has successfully carried out an initial pilot study on the factors affecting the used of *Frog* VLE among the lecturers in a Teacher Education Institute in Sarawak. An extended research model based on TAM was used for the study. The findings of this study show that the main factor influencing the use of *Frog* VLE was the attitude of the lecturers. Other minor factors affecting the use were perceived usefulness and perceived ease of use of the system. External factors like technological complexity, facilitating conditions and self-efficacy did not have direct significant influence on the use of the system by the users.

The implications from this study are that a positive attitude plays a very important role in determining the use of *Frog* VLE among lecturers. Factors like technological complexity, facilitating conditions and self-efficacy do not seem to be big problems faced by them while using the system. Factors from the organizational and technology perspectives can be included in the questionnaire to increase the scope and comprehensiveness of the study. Since this is just a pilot study involving a small group of lecturers, it is not the intention of the researchers to generalize the findings. Future studies involving lecturers from other TEIs in Sarawak could be carried out to add to the generalizability of the findings.

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