Feasibility of M-Learning Application into Teaching High School Students in Vietnam

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Abstract

This is a research result of mobile leaning (m-learning) potential assessment in Vietnam. This study examines the current status of the application of technology in the teaching process of high schools in some provinces; made assessment on the demand of learning by m-learning. The questionnaire is applied randomly to 874 high school students. The quantitative research method is conducted to assess the possibility of m- learning implementation at high schools in Vietnam. Though limited in the number of high schools, the research is helpful in giving overview and assessment of m – learning implementation of high school students in the learning process. Therefore, there are suitable policies for development of high school education field in the next periods of global integration, enable teachers and students improve activeness in teaching in a positive and effective way.

Key words:m-learning, students, teachers, teaching, high school.

Introduction

Information and communication technology is a various combination of tools and technology resources used for communication, creation, popularization, storage, and information management (Tinio, 2013). The rapid development of information technology was and is having impacts on almost every field of life including education and training. The application of Information and communication technology has created a high transformation of education from contents, methods to teaching organization manner for all study levels from primary school to post-graduate.

The application of high-tech devices in the teaching process is a global trend, especially in developed countries. In Vietnam, it is also regarded as a new teaching trend adopted by schools to bring new experiences to both students and teachers.

Mobile devices such as mobile phones, laptops are portable and can be used in classrooms to have interaction with technology and at the same time open up new forms of education and training, which are also called m-learning(Sharples et al., 2005). The adoption of mobile devices to support the learning process and necessary feedback processes, enables learning anytime and anywhere(Hussin et al., 2012; Pechuel&Beutner, 2018). Therefore, m-learning is the next step to the development of e-learning(Lehner et al, 2003). The widespread accessibility of mobile devices and the ability to learn regardless of time and place make mobile learning an important tool for lifelong learning (Nassuora, 2012).

There are many conceptions of m-learning worldwide today but two primary trends were put much emphasis: the tendency to associate m-learning with the use of technological devices in consideration of m-learning as learning with support of mobile devices (Traxler, 2005); The tendency to associate m-learning with the flexibility of learners to a form of providing learning services for students in which learning can be done anytime and anywhere (Hashemi, 2011). Therefore, it shows that two inseparable factors in m-learning are the use of technology devices and the flexibility of learners.

The purpose of this study is to assess the potential in m-learning implementation in high schools in Vietnam. So as to have the most objective and accurate assessments, the research will make an effort to answer the following research questions:

1. Is information technology infrastructure at high schools ready to meet the demands of teachers and students in m-learning application into teaching process.

2. Do teachers and students have demands in teaching and learning by m-learning?

Methodology and model development

An online survey is conducted on student objects in some high schools in Vietnam. The research used the 5 point-Likert scale, ranging from "Very disagreed" (1) to "Very agreed" (5) in order to do a survey on the assessment of teachers and students about the agreement level on views to m-learning implementation in teaching and learning at high schools.

The UTAUT model is also called Unified Theory of Acceptance and Use of Technology developed by Venkatesh et al. (2003) for the purpose of testing the acceptance of technology and more unified access. It is regarded as a unified model of 8 previous models on a basis of the most common idea which is research on acceptance of users to a new information system including: Technology Acceptance Model (TAM) (Davis, 1989); Innovation Diffusion Theory (IDT) (Rogers, 1995); Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1977); Motivation Model (MM) (Davis et al.,1992); Theory of Planned Behavior (TPB) (Ajzen, 1991); Combined TAM and TPB (Taylor & Todd, 1995); Model of PC Utilization (MPCU) (Thompson et al., 1991); and Social Cognitive Theory (SCT) (Bandura, 1986).

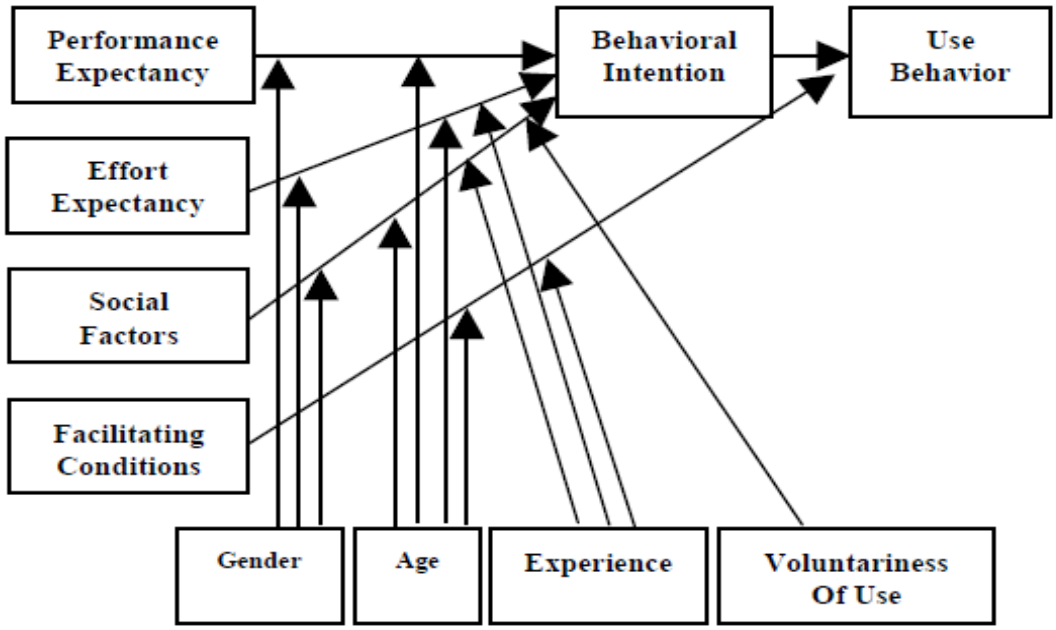

Figure 1.UTAUT model - Venkatesh et al. (2003)

In reality, in addition to the four mentioned factors, there can be other factors affecting the acceptance level of the technology users. This research used the UTAUT model which combined behavioral intention and use behavior. Moreover, we added the Trust factor. The proposed model is described in Fig. 2.

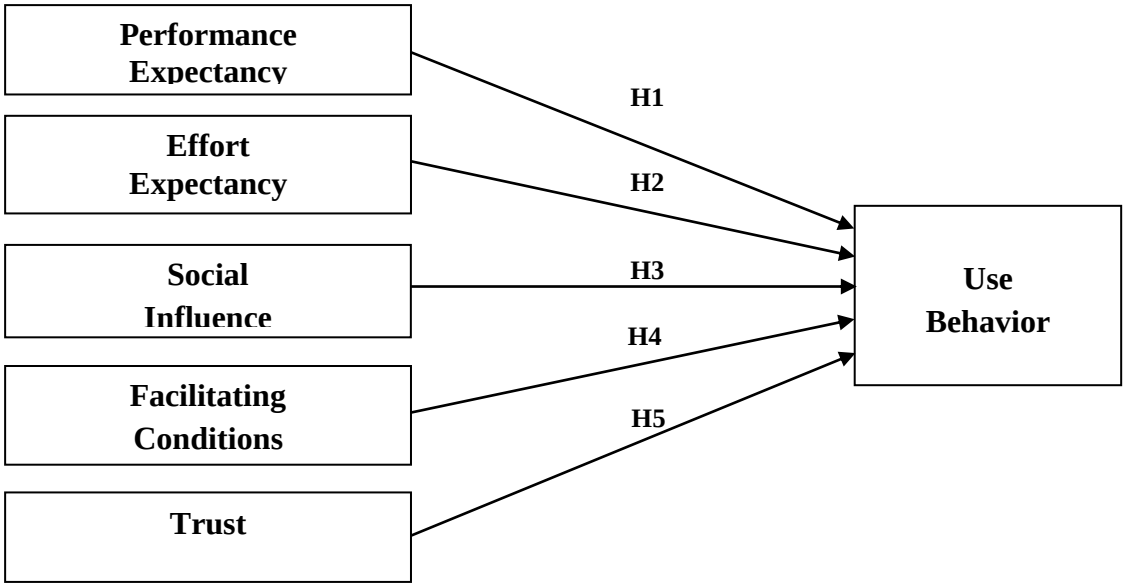

Figure 2.Research Framework

Research hypotheses

H1: Performance expectancy will have a positive influence on use behavior.
H2: Effort expectancy will have a positive influence on use behavior.
H3: Social factors will have a positive influence on use behavior.
H4: Facilitating conditions will have a positive influence on use behavior.
H5: Trust will have a positive influence on use behavior.

Results

Respondent's profile and background information

On a basis of the demographic results and other collected personal information, out of 874 surveyed students, 50.3% are female, 79.6% of students are using smartphones and 14.0% are using more than one mobile device. Students with Internet use time above two hours account for 76.6% and 63.6% of students' mobile devices have 4G internet connection. Table 1 below provides the demographic information of the students who did the survey.

Table 1.Respondents' Demographic Profile

Respondents' Profile	Classification	Frequency	%
Gender	Male	434	49.7
	Female	440	50.3
Type	Laptop	40	4.6
	Smartphone	696	79.6
	Tablet	16	1.8
	Types	122	14.0
Used time	Less than 1 hour	32	3.7
	From 1 to 2 hours	172	19.7
	From 2 to 3 hours	281	32.2

	Over 3 hours	388	44.4
Internet	Yes	556	63.6
	No	318	36.4

Test results of the factor scale

The Cronbach's Alpha coefficient indicates the correlation among variables in the questionnaire in order to estimate the changes of every variable and correlation among variables. The internal consistency reliability and construct validity using SPSS was assessed by computing the Principal Axis Factoring with Varimax rotations and Cronbach's alpha coefficients range from 0.775 to 0.915 that is shown in Table 2. The value of Bartlett's Test was 11487.566 (sig.=0.000), and the KMO = 0.910, Cumulative Variance Explained 71.993%. Therefore, the received data are suitable for factor analysis.

Table 2.Exploratory Factor Loadings & Reliability Test (α)

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
Trust 4	.893				
Trust 2	.844				
Trust 1	.806				
Trust 3	.797				
Social influence 3		.906			
Social influence 4		.888			
Social influence 1		.780			
Social influence 2		.761			
Facilitating conditions 2			.804		
Facilitating conditions 1			.776		
Facilitating conditions 3			.760		
Facilitating conditions 4			.662		
Performance expectancy 1				.792	
Performance expectancy 2				.761	
Performance expectancy 3				.733	
Performance expectancy 4				.668	
Effort expectancy 3					.750
Effort expectancy 2					.736
Effort expectancy 1					.703
Effort expectancy 4					.619
Cronbach's Alpha	.915	.904	.851	.859	.775
Cumulative Variance Explained (%) 71.993					

Extraction Method: Principal Component Analysis.
Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.910

Dependent Variable use behavior

KMO & Bartlett's Test indicates that KMO coefficient is equal to 0.724 (greater than 0.5) and Sig. less than 0.05 so that factor analysis can be conducted. Factor analysis is used to test the level of convergence of the observed variables. Table 2 shows that there is one factor drawn from 3 observed variables with an Eigenvalue of 2,290, Cumulative Variance Explained is 76.32% (greater than 50%, Gerbing& Anderson, 1988) which shows 76.32 % variation of the data explained by this factor.

Table 3.Factor analysis - Use behavior

	Component
Use behavior 1	.891
Use behavior 2	.868
Use behavior 3	.862
Eigenvalue	2.290
Cronbach's Alpha	.844
Cumulative Variance Explained(%)	76.32

Test the correlation between the independent variables

Pearson correlation coefficients (r) can range from -1 to 1 (Pallant, 2003). The sign out front indicates that if a positive correlation of one variable increases, it is followed by the other and vice versa. Information about the strength of the relationship is provided by the size of the absolute value. A perfect correlation of 1 or -1 shows that value of one variable can be perfectly determined by knowing value on the other variable (Hair et al., 2006). Also, a correlation of 0 means there is no relationship between the two variables. Knowing value of one of the variables does not assist in predicting the value of the second variable.

The Pearson test results (table 3) of the factors shows that r > 0.4 and sig.=0.00, so that the variables are accepted to continue the regression analysis.

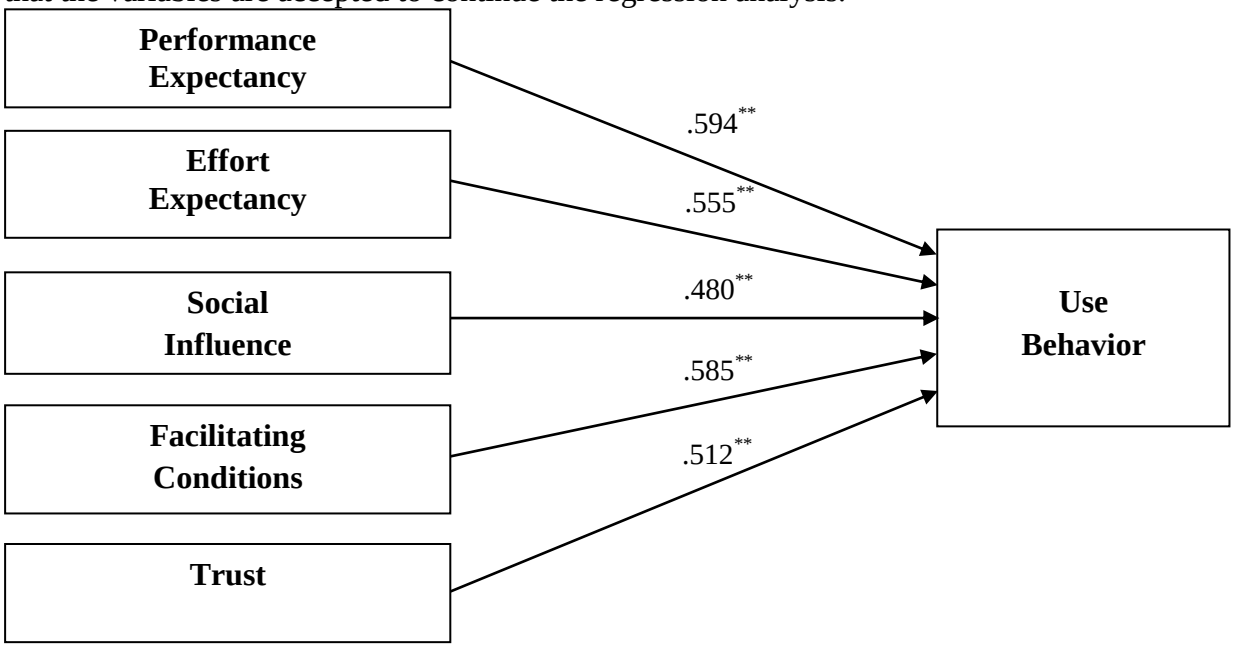

Figure 3. Research Model with Correlation Coefficients (**)

Table 3.Hypotheses Summary

Hypothesis	Pearson Correlation	Significance	Decision
Performance Expectancy → Use Behavior	0.594**	0.000	Supported
Effort Expectancy → Use Behavior	0.555**	0.000	Supported
Social Influence → Use Behavior	0.480**	0.000	Supported
Facilitating Conditions → Use Behavior	0.585**	0.000	Supported
Trust → Use Behavior	0.512**	0.000	Supported

Hypothesis test

Adjusted R^2=0.511 shows that 51,1% variation of Use behavior is explained by Trust (TR), Social influence (SI), Facilitating conditions (FC), Effort Expectancy (EE), and Performance Expectancy (PE). On the basis of the summary table of the regression model (Table 4) with the Durbin-Watson test result of 1.782, it can be concluded that there is no correlation in the model.

Table 4. Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.717[a]	.514	.511	.53324	1.782
a. Predictors: (Constant), Trust, Social influence, Facilitating conditions, Effort Expectancy, Performance Expectancy					
b. Dependent Variable: Use behavior					

The t-test with 99% significance shows that 5 independent variables are significant in the regression model. Looking at table 5, it can be seen that all the independent variables have coefficients of β>0 which proves that the variables have a positive impact on the m-learning use behavior of students. Independent variables are significant (sig.=0.00) and VIF<2 so there is no multicollinearity between the independent variables.

Table 5. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	.275	.122		2.261	.024		
	Performance Expectancy	.203	.033	.205	6.154	.000	.506	1.975
	Effort Expectancy	.200	.033	.185	6.020	.000	.596	1.677
	Social influence	.153	.027	.157	5.638	.000	.720	1.389
	Facilitating conditions	.209	.031	.220	6.840	.000	.544	1.839
	Trust	.160	.028	.167	5.780	.000	.673	1.487
a. Dependent Variable: Use behavior								

Discussion

On the basis of proposed research presented in Fig. 2 (combined from the UTAUT model) and reality of Vietnam as well as the research demand of the author, there is a possibility of assessing the effects of independent variables on the behavior use of students

during m-learning implementation. The results from practical research have provided support for 5 hypotheses of the research model and shown positive attitude leading to demand in m-learning implementation during the learning process of high school students.

The results of this research play a greatly important role in the assessment of m-learning demand among high school students. The research findings are meaningful for high schools that have not yet implemented m-learning so that they can have a comprehensive view of the feasibility of m-learning application in the teaching process at high schools. While doing a survey on the effect of m-learning on the learning process of students, there were very positive results in the expected performance of the research. In addition, students also agree to introduce and support other students when learning through m-learning. Furthermore, they are always supported with knowledge and experience as learning by m-learning. The students showed great interest in experiencing a new, interactive and convenient learning method.

The limitation of this research is the limited scale of students to some high schools in a number of provinces in Vietnam without representation for all provinces in our country. In addition, the survey is only limited to students using mobile devices or computers. Therefore, the scope of this topic is unable to thoroughly assess all of m-learning application potential at all study levels in all of the provinces in Vietnam.

Conclusion

The purpose of this study is to determine the feasibility of m-learning implementation in the teaching process at high schools. Among the surveyed students using mobile devices, the rate of mobile phone users with Internet connection is quite high (63.6%). The time for students to access the internet for entertainment and learning purposes on mobile devices above 2 hours is quite high (76.6%). Most of the students appreciated the necessity of m-learning implementation in the learning process. Most students think that when implementing m-learning in teaching, it will bring convenience in terms of learning demands anytime and anywhere; create activeness in self-assessment of their own learning results and promote their interest in learning.

The results of this research can support other research and development of m-Learning at high schools in Vietnam in the future. The research findings also show that applications of information technology marked significant changes in teaching in foreign countries as well as in Vietnam. Judging by the assessment and learning demand of students for m-learning in the research, we can conclude that the building of the m-learning model is absolutely rational and feasible.

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