Students' Acceptance of E-learning Adoption in Higher Education: An Empirical Study in Vietnam

NGUYEN VAN DUC, LUU VAN HIEU*
Hanoi Industrial Textile Garment University,
Hanoi,
VIETNAM
*Corresponding author

Abstract: - E-learning models have been dramatically spreading during the COVID-19 outbreak. The study's objective is to investigate students' acceptance of E-learning in the context of Vietnam's higher education. UTAUT model was adopted to evaluate the acceptance and use of the E-learning method. The analyzed data were collected from 531 undergraduate students in Vietnam, who currently use E-learning environments. The findings indicated that social influence had a significant impact on behavioral intention. The behavioral intention and facilitating conditions were two factors affecting the acceptability of E-learning for university students. Also, those findings have enriched students' understanding of adopting E-learning. They provide suggestions and implications for educators and institutions in the continuing implementation of e-learning at Vietnamese higher education institutions.

Key- Words: Students' acceptance; E-learning; higher education; UTAUT model; Vietnam.

Received: April 19, 2022. Revised: November 23, 2022. Accepted: December 22, 2022. Published: January 31, 2023.

1 Introduction

In the early 1990s, the two open universities in Hanoi and Ho Chi Minh City, which delivered E-learning, were opened. However, Vietnam has adopted the e-learning mode, [1]. Educational technology, in general, in regular university courses in Vietnam was still limited at that time. Intrinsic motivation did not commonly exist in Universities to utilize the new educational technology in their daily practices. In addition, the government did not have sufficient policies and guidelines to support and encourage universities to integrate new educational technology into their regular courses, [2]. In 2020, the COVID-19 pandemic had a considerable impact on higher education. There was no exception in Vietnam. The Covid-19 pandemic forced higher education institutions (HEIs) to halt traditional in-person and face-to-face learning, [3]. In response to an unexpectedly long period of school closures, Vietnamese higher education institutions have taken to e-learning, as it is considered a promising approach to continuing education activities during school closures.

Electronic learning (E-learning) enables students to take part in the educational process through a virtual environment instead of face-to-face communication. Several benefits of e-learning systems include ease of access to materials content, effortless team collaboration, and on-time mutual discussions without the concern of time and space limitations for interactions between student and professor. Despite many advantages of e-learning systems, the transformation of the educational style arises various challenges that may significantly affect the culture and continuing needs for the development of technical skills of both students and educators. More specifically, the success of e-learning depends on users' perceptions, knowledge, and skills in exploiting information and communication technology (ICT) tools. Therefore, understanding the factors affecting E-learning adoption is essential to successfully apply the learning process in an E-learning strategy.

Numerous previous studies focused on studying the factors affecting e-learning applications and their impacts. However, these factors frequently vary because they rely on the individuals and particular contexts. It is believed that having a specific theoretical model is necessary. Therefore, each student can fully understand the factors affecting context-specific e-learning adoption. The study's primary purpose is twofold. First, to analyze the e-learning research which utilized the Technology Acceptance Model (TAM) and the Unified Theory of

Acceptance and Use of Technology (UTAUT), then identify the factors that affect student's acceptance into E-learning adoption in higher education in Vietnam. Second, to empirically explore the impacts of the factors which influence students in adopting E-learning.

2 Literature Review

Several studies have been conducted to examine which factors influence the acceptability of students toward E-learning. The Technology Acceptance Model (TAM) [4], derived from the Theory of Reasoned Action [5], has been the most widely used conceptual model in the field of research. The core elements of TAM are perceived usefulness and perceived ease of use. Perceived usefulness can be defined as "the degree to which a person believes that using a particular system would enhance his or her job performance". Whereas, perceived ease of use is "the degree to which a person believes that using a particular system would be free of effort". The TAM model indicates that perceived usefulness and perceived ease of use are predictors of the behavioral intention to use an information system. The original Technology Acceptance Model (TAM) has been extended and modified to identify the most widely used external factors concerning e-learning acceptance [6]. The research findings show that system quality, computer self-efficacy, and computer playfulness have a significant impact on the perceived ease of use of e-learning systems. Moreover, information quality, perceived enjoyment, and accessibility were proved to have a positive influence on the perceived ease of use and perceived usefulness of the e-learning systems. [7] also used the TAM model to predict the acceptance of e-learning by Jordanian students. The study indicated that in order to motivate students' intentions to use technology in their learning environment, it is necessary to deliver a positive perception of technology advantages. An extended Technology Acceptance Model (TAM) was used to investigate the importance of factors in technology adoption and use in the Lebanese context. The findings showed that perceived usefulness, perceived ease of use, social norms, and quality of work life are significant determinants of students' behavioral intention, [8].

Based on the TAM model, [9] developed the UTAUT model to focus on the intent to use and the use behavior of users towards information technologies, placing emphasis on four main determinants of the intention to use and use behavior. A study by [10] evaluated the acceptance and use of a virtual learning environment in higher education by using the UTAUT model. The study finding indicated that the behavioral intention and use behavior regarding the utilization of a virtual learning environment in higher education differed between Turkey and UK, and that the level of impact of the factors that form behavioral intention and use behavior also differed from one factor to another. Another study, using the UTAUT model, by [11] explored student readiness for online learning in the Northeast of Thailand. The study explored students' self-regulation, computing devices ownership, and level of familiarity with education-related technologies. The findings indicate that students have a slightly positive perception of e-learning. The study also shows that students use mobile technologies extensively, and have experience using social media, but are unfamiliar with other collaborative e-learning tools. The study by [3] used the adjusted TAM to investigate the relationships of the elements in the model. The results show that computer self-efficacy has a positive impact on perceived ease of use. It is also indicated that the social factor has a direct effect on the student's attitudes.

Based on the above discussions, the proposed hypotheses are as follows:

H1: Performance expectancy has a significant effect on behavioral intention.

H2: Effort expectancy has a significant effect on behavioral intention.

H3: Social influence has a significant effect on behavioral intention.

H4: Facilitating conditions have a significant effect on e-learning acceptance.

H5: The users' behavioral intention has a significant effect on e-learning acceptance.

The research framework (as in Figure 1) captures both practical and psychological implications in regard of the acceptance of E-learning.

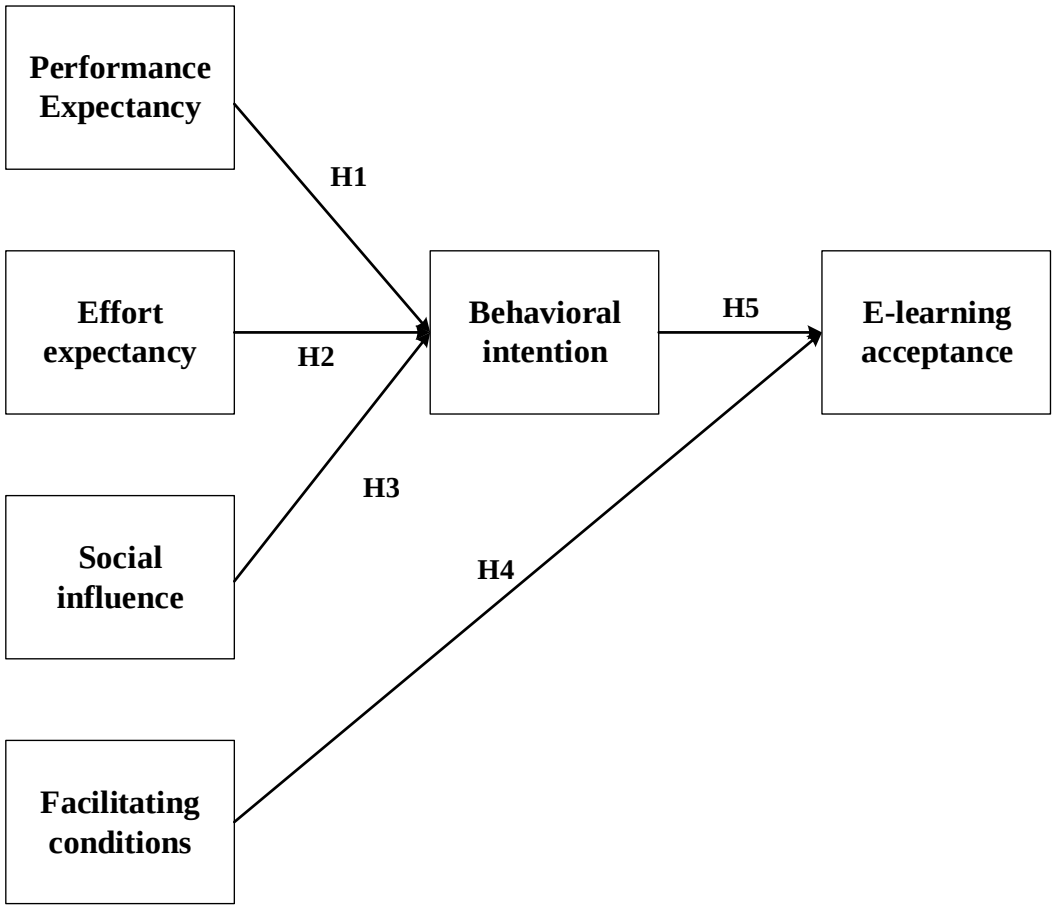

Fig. 1: The research framework [9]

3 Methodology

An online questionnaire survey was utilized in this study and distributed among undergraduate students. It mainly consisted of closed-form questions. The first part included questions aimed at collecting data on the demographic characteristics of the respondents, such as age, gender, and education. In the second part, to identify the factors affecting students' acceptance of E-learning adoption in higher education, a sample questionnaire was listed in the sheet. This survey was conducted online between 28 May and 10 June 2021, when the COVID-19 pandemic struck Vietnam and the world. The survey questionnaire was distributed using social networks to reach as many students in Vietnam as possible. The survey link was delivered to all the targeted students via email and other social networks (Zalo and Facebook). The data collection was supervised and monitored by the research group.

Overall, the survey had 531 valid responses, and thus, it was included in the data analysis. The collected sample size (N=531) is greater than the minimum sample size requirement. Therefore, the sample size is regarded to be acceptable. These 531 respondents were from various universities across Vietnam. Among respondents, there were more males (78.8%) than females (21.2%). Most of the respondents (77.9%) were third-year students. Regarding the ease of Internet access, most students (95.2%) had no difficulty accessing the Internet and using the network devices.

4 Results and Discussions

Main devices and platforms in E-learning adoption

The study shows that most students own notebook computers and smartphones, with only 20.9% of those who own desktop computers. Moreover, the smartphone is the top device students use to connect to the Internet. The consistency of the findings consolidates the high ownership rate of smartphone devices in Vietnam. It seems that Vietnamese

students tend to only use the computer at school and do not have desktop computers at home.

Providing effective tools within blended and online learning environments is necessary. Highly regarded tools like Course Management Systems (CMS) and Learning Management Systems (LMS) are not commonly used in schools. Systems (LMS) are not frequently used in schools. The survey indicates that Zoom (71.56%), Microsoft Team (10.55%), and Google Meet (17.89%) are the three main streaming platforms that universities are using. With regard to using social networks and online application software platforms, the study shows that the students are very familiar with Facebook, search engines (Google Search), video sharing platforms (YouTube and Tiktok), and text chat. It can be concluded that almost students can use basic software tools and utilize the Internet, mostly for web browsing, connecting with friends via chatting or Facebook, and watching YouTube and Tiktok videos. Students who are familiar with computers and technology are expected to easily accept e-learning.

Testing the validity and reliability of the scales

Table 1 summarizes the factor analysis performed on the dataset and also shows the factor loads of the questionnaire items and Cronbach's alpha coefficients of the variables. As can be seen, Cronbach's alpha coefficients are in the range of 0.881 and 0.932, confirming that the factor can be acceptable. Table 2 shows the correlation coefficients between the variables in the data sample. As shown in Table 2, strong positive correlations were found among constructs within the acceptance scale. Within the acceptance scale, the relationship between performance expectancy and effort expectancy was the strongest ($r = .860, p < .01$). The weakest relationship was between facilitating conditions and performance expectancy ($r = .685, p < .01$).

Table 1. Factor analysis results and Cronbach's alpha coefficients

Measurement Items	Factor loads	Cronbach's alpha
Performance Expectancy (PE)		.932
E-learning would help me improve my academic performance (PE1).	.699	
E-learning would allow me to do more work in less time (PE2).	.728	
E-learning would make it easier to do my schoolwork (PE3).	.743	
E-learning will be useful for my career (PE4).	.771	
Effort expectancy (EE)		.883
Learning to use e-learning would be easy for me (EE1).	.791	
I need support when using e-learning (EE2).	.692	
It would be easy for me to become skillful at using e-learning (EE3).	.763	
Social influence (SI)		.881
My parents will agree on it if I choose to enroll in an online class (SI1).	.613	
My classmates are willing to use e-learning (SI2).	.739	
My lecturers have been helpful in the use of e-learning (SI3).	.586	
In general, my university has supported the use of e-learning (SI4).	.688	
Facilitating conditions (FC)		**.900**
I have the necessary resources (the Internet and access devices) to use e-learning (FC1).	.651	
I have the knowledge necessary to use e-learning (FC2).	.625	
Behavioral intention		
I intend to use e-learning in future modules.	.650	

Table 2. Pearson correlations between key variables

	PE	EE	SI	FC
PE	1			
EE	.860**	1		
SI	.828**	.786**	1	
FC	.685**	.718**	.755**	1

***. Significant at p<.01, two-tailed*

Testing the hypotheses

The regression analysis was made to identify the effects of Performance Expectancy (PE), Effort Expectancy (EE), and Social Influence (SI) on Behavioral intention. The obtained F value of 51.489 with $p < 0.01$ indicates that the regression model was statistically significant. An evaluation of the adjusted R^2 value showed that the regression model 60.7% of the variance in the sample. Table 3, and Table 4 present the beta coefficient and significance levels concerning the effect of the variables. The effects of social influence on behavioral intention were significant. This finding revealed that the H3 hypothesis is supported. Also, according to the analysis result, the evaluation of the coefficients

related to the effects of performance expectancy and effort expectancy on behavioral intention was not significant ($p > 0.5$). For this reason, the H1 and H2 hypotheses are not supported.

Table 3. Regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.064	.307		-.209	.835
PE	.040	.181	.031	.223	.824
EE	.154	.175	.112	.878	.382
SI	.840	.147	.661	5.710	.000

Dependent variable: Behavioral intention
R=.779; Adjusted R^2=.607; F=51.489; p=.000

In the following step, a multi-linear regression was also used to test the H4 and H5 hypotheses. In the model, facilitating conditions and the users' behavioral intention were included as independent variables, and the dependent variable is E-learning acceptance. The data set had an F value of 106.454 and a p value < 0.01. This showed that the model was statistically significant. An evaluation of the adjusted R^2 value demonstrated that the regression model made up 67.2% of the variance in the sample. As a result, the coefficients' assessment related to the effects of Behavioral intention and Facilitating conditions on E-learning acceptance was significant. For this reason, the H4 and H5 hypotheses are supported.

Table 4. Regression analysis results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.514	.232		2.213	.029
BI	.641	.074	.700	8.625	.000
FC	.168	.085	.161	1.985	.050

Dependent variable: E-learning acceptance
R=.824; Adjusted R^2=.672; F=106.454; p=.000

According to obtained analysis results, three out of five hypotheses were supported. As in the previous studies [10], [11], social influence has had the most positive effect on behavioral intention. Social influence can be defined as "the degree to which an individual perceives that he or she should use the new system." As in the aforementioned studies, social influence is the variable that has had the most significant influence on the intention to use a new system. Additionally, it can be known as the approval from parents. It was reported that student's

parents would be pleased when they enrolled in an online course. Also, being closely aligned with the earlier studies, it was found that the effects of the facilitating conditions and behavioral intention variables on the E-learning acceptance were significant. It was identified that behavioral intention and facilitating conditions were two direct determinants of adopting behavior [9]. Students with good facilitating conditions, such as computers and Internet access, tend to think that e-learning brings advantages and is easy to accept.

Contrary to some previous studies, performance expectancy and effort expectancy were found to have no effect on behavioral intention. The difference may come from the fact that COVID-19 was an unexpected intermission for students in Vietnam, and since then, schools and universities have been asked to roll out their teaching to online mode, [12]. This no-impact result is reasonable given the fact that students had little choice at that time.

5 Conclusions

In light of the global trend towards e-learning, higher education institutions in Vietnam have experienced radical changes. The transition from traditional learning to an online learning model in late 2020 due to the COVID-19 pandemic was unprecedented in Vietnamese history. The COVID-19 outbreak was crucial in bringing online learning to the mainstream in Vietnam. E-learning adoption is an essential subject for the education sector. Various studies have been conducted on this subject, and several models that mainly attempt to describe e-learning adoption on an individual basis have been proposed.

Some results of the current studies are different from the prior research. It might be due to a lack of information about online education. With the shift to exclusive online learning during the COVID-19 pandemic, many universities had to provide online courses to adapt social distancing guidelines. Institutions, lecturers, and students needed to be well-prepared to participate in this kind of learning mode through training and other support. This includes developing good curriculums and facilities for solving technical problems and difficulties both lecturers and students might face during e-learning classes.

According to the study findings, there was a positive impact of social influence on students' behavioral intention of e-learning systems. In addition, behavioral intention and facilitating conditions have positively influenced the acceptability of e-learning in higher education

The findings of this research are based on empirical evidence, which examines factors that influence the acceptance of e-learning systems among university students. Policymakers, designers, and developers can be benefited from the study's results. Thus, they have made a remarkable contribution to reviewing and utilizing the successful usage of e-learning systems in higher education. Fundamentally, this study has shed light on the importance of e-learning adoption in higher education institutions, especially for the younger generation.

References:

[1] M. Kang and A. Duong, "Student Perceptions of First-time Online Learning During the COVID-19 Pandemic in Vietnam," *ie Inq. Educ.*, vol. 13, no. 1, p. 8, 2021.

[2] H.-H. Pham and, T. T. H. Ho, "Toward a 'new normal' with e-learning in Vietnamese higher education during the post COVID-19 pandemic," *High. Educ. Res. Dev.*, vol. 39, no. 7, pp. 1327–1331, 2020.

[3] N. T. T. Ho, S. Sivapalan, H. H. Pham, L. T. M. Nguyen, A. T. Van Pham, and H. V. Dinh, "Students' adoption of e-learning in emergency situation: the case of a Vietnamese university during COVID-19," *Interact. Technol. Smart Educ.*, 2020.

[4] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Q.*, pp. 319–340, 1989.

[5] M. Fishbein, and I. Ajzen, "Belief, attitude, intention, and behavior: An introduction to theory and research," 1977.

[6] S. A. Salloum, A. Q. M. Alhamad, M. Al-Emran, A. A. Monem, and K. Shaalan, "Exploring students' acceptance of e-learning through the development of a comprehensive technology acceptance model," *IEEE Access*, vol. 7, pp. 128445–128462, 2019.

[7] A. Al-Adwan, A. Al-Adwan, and J. Smedley, "Exploring students acceptance of e-learning using Technology Acceptance Model in Jordanian universities," *Int. J. Educ. Dev. using ICT*, vol. 9, no. 2, 2013.

[8] A. Tarhini, K. S. Hone, and X. Liu, "Factors affecting students' acceptance of e-learning environments in developing countries: a structural equation modeling approach," 2013.

[9] V. Venkatesh, M. G. Morris, G. B. Davis, and F. D. Davis, "User acceptance of information technology: Toward a unified view," *MIS Q.*, pp. 425–478, 2003.

[10] Ö. E. Kurt, and Ö. Tingöy, "The acceptance and use of a virtual learning environment in higher education: an empirical study in Turkey, and the UK," *Int. J. Educ. Technol. High. Educ.*, vol. 14, no. 1, pp. 1–15, 2017.

[11] A. Ngampornchai, and J. Adams, "Students' acceptance and readiness for E-learning in Northeastern Thailand," *Int. J. Educ. Technol. High. Educ.*, vol. 13, no. 1, pp. 1–13, 2016.

[12] G. Maheshwari, "Factors affecting students' intentions to undertake online learning: An empirical study in Vietnam," *Educ. Inf. Technol.*, pp. 1–21, 2021.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

The authors equally contributed in the present research, at all stages from the formulation of the problem to the final findings and solution.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

No funding was received for conducting this study.

Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.