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ORIGINAL ARTICLE

Determinants of Online Education Technology Acceptance Among Vietnamese Undergraduates: A UTAUT-Typed Model Analysis

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ABSTRACT
The COVID-19 pandemic and information technology development have boosted online education, especially at higher education institutions. However, what makes online education exciting and valuable and influences student acceptance is not always understood. Using the modified unified theory of acceptance and use of technology (UTAUT) model, stratified probability sampling method, the survey technique, 232 valid Vietnamese undergraduates as respondents, reliability and Pearson correlation tests, confirmatory factor analysis, and SEM, this study shows that the performance expectancy is not statistically significant in affecting the Vietnamese undergraduates' behavioral intentions related to online education technology acceptance. Also, the facilitating conditions are not statistically significant in affecting usage behavior. However, effort expectancy and social influence are statistically significant and positively affect Vietnamese undergraduates' behavioral intentions related to online education technology acceptance. Furthermore, the empirical results support behavioral intention's positive and significant impact on usage behavior. These findings help educators gain further knowledge of students' needs and then invest more in education technology for the success of their students and institutions. Also, higher education institutions are encouraged to spend more time and resources to train their students using technology to boost their online education acceptance.

1. INTRODUCTION

In the literature, many studies show the benefits of online compared with traditional classroom education. Recent studies (Bradley, 2020; Dinh et al., 2022; Song et al., 2019; Tuckel & Pok-Carabalona, 2023; Watson et al., 2023) point out that online education offers students many advantages, such as efficiency, flexibility, safety, affordability, and accessibility over traditional education. Similarly, another study shows that most students can maintain their learning progress with online education (Dinh & Nguyen, 2020). Also, fully engaged students with learning management systems (LMS) such as Google Classroom and Moodle are more likely to succeed in their classes in an open distance learning environment (Swart, 2015).

In the Internet of Things (IoT) era, online education using LMS has become popular, especially in developed countries (Smalley, 2021; Song et al., 2019; Pham & Ho, 2020), with the number of users estimated at 73.8 million worldwide (Bouchrika, 2023). To adapt and respond to the social distancing call due to the COVID-19 pandemic,

with 94% of students worldwide negatively affected (Pokhrel & Chhetri, 2021), nearly all universities around the world have turned to online classes via television or internet (Ho et al., 2021; Mukuka et al., 2021), including Vietnamese universities (Pham & Ho, 2020; Pham et al., 2021). The reasons are that the LMS provides the tools for all parts of the learning process, e.g., a virtual place for lecturers to upload their teaching materials and notify and grade the students' works (Watson & Watson, 2007). However, what makes online education exciting and valuable and influences student acceptance is not always understood.

This study is one of the very first empirical research examining the determinants of online education acceptance in Vietnam higher education using a unified theory of acceptance and use of technology (UTAUT)-typed model. Specifically, this study will address five hypotheses (H1 - H5) as follows:

H1: Does performance expectancy affect the Vietnamese undergraduates' behavioral intention related to online education technology acceptance?

H2: Does effort expectancy affect the Vietnamese undergraduates' behavioral intention related to online education technology acceptance?

H3: Does social influence affect the Vietnamese undergraduates' behavioral intention related to online education technology acceptance?

H4: Does the Vietnamese undergraduates' behavioral intention affect usage behavior related to online education technology acceptance?

H5: Do the facilitating conditions affect the Vietnamese undergraduates' usage behavior related to online education technology acceptance?

2. LITERATURE REVIEW

2.1. Technology acceptance models

Theoretical and empirical studies existed to discover the gap in knowledge on people's technological acceptance, such as the Technological Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), and Innovation Diffusion Theory (IDT). The TRA model predicted human behaviors in technological acceptance through attitude and subjective norms (Davis et al., 1989). The TPB model contains a new term for perceived behavioral control. Empirical results showed that self-efficacy and facilitating conditions strongly impacted perceived behavioral control, which are determinants of behavioral intention and usage behavior (Taylor & Todd, 1995). The IDT model pointed out that innovation characteristics can impact behavioral intention in the stage of the innovation process. There is a significant difference between pre-adoption and post-adoption of users on behavioral intention (Karahanna et al., 1999).

To explain the intention and behavior of using technology, a well-known study (Venkatesh et al., 2003) introduced the UTAUT using classical theories such as TRA, TPB, TAM, Motivation Model (MM), Model of PC Utilization (PCUM), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). This UTAUT model included four factors: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). This study argued that PE, EE, and SI influenced behavioral intention (BI) while FC affected usage behavior (UB). Also, the BI directly affected the UB. So, this model is considered optimal in explaining behavioral intention to use technology. It is worth noting that this UTAUT has some advantages but is complex compared to other models (Yu, 2012).

2.2. Applications of UTAUT in education

Some studies used the UTAUT to explain the use of the LMS in literature. A recent study (Abbad, 2021) examined the undergraduates' intentions to use and their actual usage of the LMS – Moodle in a public university in Jordan. The results showed that the PE and EE affected BI to use Moodle whereas SI did not. Also, the BI and FC directly affected the students' UB of Moodle. Another study (Garone et al., 2019) examined the lecturers' technology acceptance and use of a new LMS at a Belgian university using the predictor variables of UTAUT. The results showed three groups of technology acceptance in university lecturers: high, moderate, and low. The lecturers in the high group are most likely to innovate and use a new LMS. However, the lecturers in the moderate and low groups most likely need additional support and social influence from policy and decision-makers to use a new LMS. One study (Alshehri et al., 2019) applied the UTAUT model and structural equation modeling techniques to investigate

the Saudi Arabian students' BI and UB of a new LMS - Blackboard. This study showed that technical support is fundamental in determining students' acceptance and use of a new LMS. Another study (Raman et al., 2014) examined the level of acceptance of a new LMS – Moodle of a Malaysian university using the UTAUT. This study claimed that PE, SI, and FC positively influenced BI. However, under the moderate influence of gender, PE, EE, SI, and FC did not significantly and positively influence BI. Another study (Sumak et al., 2010) investigated the undergraduates' perceptions about using Moodle using the UTAUT and the structural equation modeling (SEM) approach. This study claimed that PE and SI significantly impacted students' attitudes toward using Moodle. The social influence and attitudes toward using were significant determinants of students' BI. Also, students' BI was a significant determinant of the actual use of Moodle.

Other studies in literature also studied the relationship between the factors of UTAUT and BI in education. Using the UTAUT and intrinsic values of enjoyment and interest, one study (Khechine et al., 2020) examined the determinants of LMS acceptance in which a social media tool is embedded. This study showed that the FC and intrinsic value variables explained the BI to use the LMS that integrates social media technology. Also, the FC could be used to predict the UB. Another study (Fathema et al., 2015) investigated how university lecturers' beliefs and attitudes influence their intention and actual use of the LMS. The results showed that the three proposed external variables, system quality, perceived self-efficacy, and facilitations conditions, were significant predictors of faculty attitude towards the LMS. Another study (Sung et al., 2015) examined the structural relationship among self-efficacy, social influence, effort expectancy, performance expectancy, and behavioral intention of online education acceptance in Korea. The results claimed that self-efficacy positively affected SI, EE, PE, and BI. The SI positively affected EE, PE, and BI. The EE yielded positive effects on PE and BI. Also, the PE yielded a positive effect on BI.

3. MATERIALS AND METHODS

3.1. Hypotheses and model

This study employed five hypotheses to examine the determinants of online education acceptance in Vietnam's higher education (as stated in the Introduction). Also, to determine the nexus between independent variables PE, EE, SI, and FC, intermediate variable BI, and dependent variable UB, this study employed a UTAUT-typed model as in Figure 1.

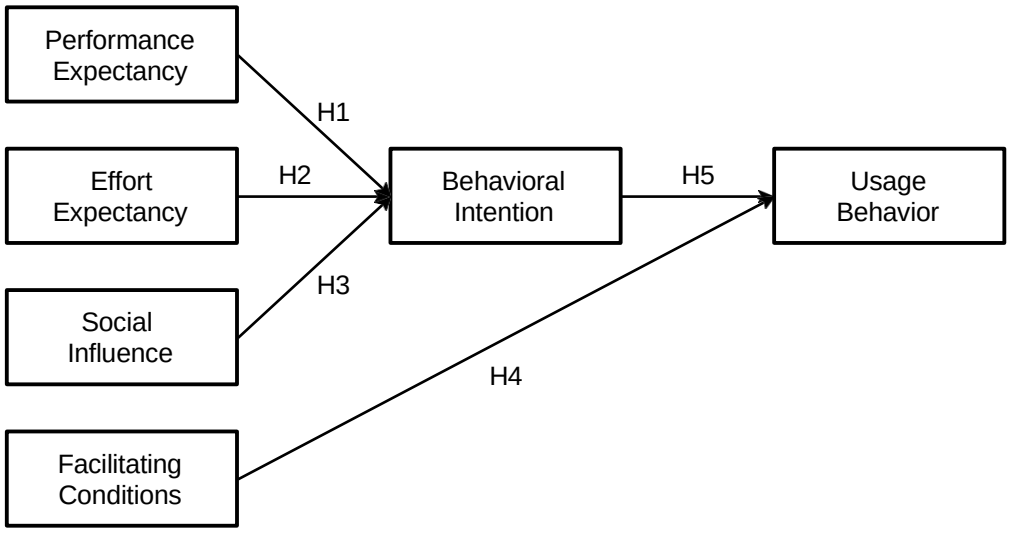

Figure 1. The UTAUT-typed model

3.2. Variables

This study adapted the used and proven items from other studies to measure PE, EE, SI, and FC (Attuquayefio & Addo, 2014; Venkatesh et al., 2011). Similarly, to measure BI, this study adapted the used and proven items from other papers (Agudo-Peregrina et al., 2014; Davis, 1986; Venkatesh et al., 2011). Last, to measure UB, this study adapted the used and proven items from other studies (Agudo-Peregrina et al., 2014; Attuquayefio & Addo, 2014) as in Table 1.

Table 1. The variables and questionnaire items of this study

No	Code	Measurement	Source
		Performance Expectancy (PE)	
1	PE1	LMS is useful to my study.	(Attuquayefio & Addo, 2014; Venkatesh et al., 2011)
2	PE2	I can accomplish the learning activities faster using LMS.	
3	PE3	My learning productivity will increase when I use LMS.	
4	PE4	I can have more opportunities to get higher grades if I use LMS.	
		Effort Expectancy (EE)	
1	EE1	It is clear and understandable, so I can learn and use LMS.	(Attuquayefio & Addo, 2014; Venkatesh et al., 2011)
2	EE2	I am very good at using LMS.	
3	EE3	It is easy for me to learn and use LMS.	
4	EE4	It is easy for me to use LMS to do what I want .	
		Social Influence (SI)	
1	SI1	My important people think that I should use LMS.	(Attuquayefio & Addo, 2014; Venkatesh et al., 2011)
2	SI2	People who influence my behavior think that I should use LMS.	
3	SI3	The final year at university is helpful to me in using LMS.	
4	SI4	Generally, my university supports the use of LMS.	
		Facilitating Conditions (FC)	
1	FC1	I have the necessary resources to use the LMS.	(Attuquayefio & Addo, 2014; Venkatesh et al., 2011)
2	FC2	I have the necessary knowledge to use the LMS.	
3	FC3	I feel that the LMS is incompatible with other systems that I have used before.	
4	FC4	I think I should have a technician to help me handle the difficulties of using LMS.	
		Behavioral Intention (BI)	
1	BI1	I have the intention to use LMS in the future.	(Agudo-Peregrina et al., 2014; Davis, 1986; Venkatesh et al., 2011)
2	BI2	I guess I will use the LMS in the future.	
3	BI3	I have a plan to use the LMS in the future.	
4	BI4	I will recommend LMS to my colleagues.	
		Usage Behavior (UB)	
1	UB1	I believe that I am a regular LMS user.	(Agudo-Peregrina et al., 2014; Attuquayefio & Addo, 2014)
2	UB2	I like using LMS more when available.	
3	UB3	I do most of my learning assignments using LMS.	
4	UB4	I tend to use LMS as much as possible.	

3.3. Statistical analysis methods

This study used descriptive and inference statistics to analyze the data and test the hypotheses. In the beginning, the demographics and descriptive statistics were analyzed. Then, this study employed the reliability test using the prevalent technique - Cronbach's alpha and corrected item-total correlation to analyze the reliability of the used variables. Next, the Pearson correlation test was used to examine the correlation between independent, intermediate, and dependent variables. Then, the confirmatory factor analysis (CFA) was applied to examine the variable structure and the relationship between variables. Last, this study employed structural equation modeling (SEM) using the analysis of moment structures (AMOS) software to examine the structural relationship between variables. It is worth noting that the variables and questionnaire items used in this study are from well-established studies, as in Table 1. So, the exploratory factor analysis (EFA), such as the Kaiser - Meyer - Olkin and Bartlett's tests on this same data, will not provide much more helpful information. Thus, it was ignored.

3.4. Data

This study employed the survey technique to minimize physical contact during and after the COVID-19 outbreaks in Vietnam. At first, all items in the questionnaire were translated into Vietnamese to ensure understanding among the Vietnamese undergraduates. Next, the survey was mailed to three researchers in this field at two universities for comments and validation. Then, the revised survey was tested on a small group of 30 undergraduates from three universities in Hochiminh and Thudaumot in a pilot study as guided (Krueger et al., 2001). As a common practice, this study also applied the 5-point Likert scale (1 - strongly disagree, 2 - disagree, 3 - neutral, 4 - agree, 5 - strongly agree) to ask for responses for each item in Table 1. The gender and age of respondents were also collected to gain more knowledge and control the sampling bias, as in Table 2

Table 2. The demographics of respondents

No	Demographics	Item	Scale
1	Gender	What is your gender?	Male Female
2	Ages	How old are you?	18-25 26-32 > 32

3.5. Sampling method and sample size

Most Vietnamese universities and high-ranked ones are located in major metropolitan areas, such as Hanoi, Ho Chi Minh city, Da Nang city, Can Tho city, Bien Hoa city, Nha Trang city, and Thu Dau Mot city. These universities have more resources and are more likely to invest in new technology and LMSs than other universities in rural areas. So, this study focused on and treated those metropolitan areas as strata and used the stratified probability sampling technique to collect the data and minimize sampling errors and bias. With 1,672,000 Vietnamese undergraduates in Vietnam (Vietnam Ministry of Education and Training, 2021), we sent out a total of 433 surveys to prospective respondents. However, there were only 232 respondents who answered all the items in the survey. So, the final and valid sample size 232 attained a sampling error of 4.8% (excluding the 30 respondents from the pilot study). This sample size of 232 met the threshold that other studies suggested (Comrey & Lee, 1992; Gorsuch, 1983; Guilford, 1954; Hair et al., 2019; MacCallum et al., 1999). Also, the sample size 232 to 6 variables ratio is more than 38, which is more than adequate for this type of study (Everitt, 1975; Gorsuch, 1983; Hair et al., 2019).

4. RESULTS AND DISCUSSION

4.1. Demographics of respondents

Table 3 shows the gender and age of respondents in this study, with 54.3% male and 45.7% female. Also, most respondents (85.3%) were 18-25. These results align with gender equality and age among Vietnamese undergraduates and statistics of Vietnam higher education (Vietnam Ministry of Education and Training, 2021).

Hence, the respondents in the sample and their opinions well represented the population of Vietnamese undergraduates in terms of gender and age.

Table 3. Demographics of respondents

Gender			Age		
Male/Female	**Frequency**	**Percent**	**Years of age**	**Frequency**	**Percent**
Male	126	54.3	18 - 25	198	85.3
Female	106	45.7	26 - 32	29	12.5
Total	232	100.0	Over 32	5	2.2
			Total	232	100.0

4.2. Descriptive statistics of variables

Table 4 shows the descriptive statistics of each item of independent variables PE, EE, SI, and FC, intermediate variable BI, and dependent variable UB, as in Figure 1. The results showed that the means exceeded the cut-off point 3 (3.69 - 4.23). Among items of independent variables, EE4 (It is easy for me to use LMS to do what I want) got the highest mean of 4.23. In contrast, PE2 (I can accomplish the learning activities faster using LMS) got the lowest mean of 3.87. Among items of the dependent variable, UB4 (I tend to use LMS as much as possible) got the highest mean of 3.79, while UB2 (I like using LMS more when available) scored the lowest mean of 3.69. Hence, these descriptive statistics mean that the undergraduates liked to use a LMS for their study, at least in this sample.

Table 4. Descriptive statistics of each item from all variables

	N	Minimum	Maximum	Mean	Std. Deviation
PE1	232	1	5	4.22	1.139
PE2	232	1	5	3.87	1.095
PE3	232	1	5	3.94	1.101
PE4	232	1	5	3.89	1.174
EE1	232	1	5	4.09	1.041
EE2	232	1	5	4.09	1.061
EE3	232	1	5	4.22	1.018
EE4	232	1	5	4.23	.991
SI1	232	1	5	4.08	1.062
SI2	232	1	5	4.15	1.036
SI3	232	1	5	4.16	1.036
SI4	232	1	5	4.12	1.023
FC1	232	1	5	4.12	.952
FC2	232	1	5	4.06	1.000
FC3	232	1	5	4.06	1.009
FC4	232	1	5	4.07	.995
BI1	232	1	5	3.91	1.119
BI2	232	1	5	3.94	1.037

BI3	232	1	5	4.08	.966
BI4	232	1	5	3.99	.987
UB1	232	1	5	3.73	1.142
UB2	232	1	5	3.69	1.100
UB3	232	1	5	3.73	1.093
UB4	232	1	5	3.79	1.049

4.3. Reliability test using Cronbach's alpha and corrected item-total correlation

Table 5 shows the Cronbach's alpha and corrected item-total correlation of independent, intermediate, and dependent variables. The results showed that the alphas were 0.81 - 0.90, exceeding the threshold of 0.7 (Bonett & Wright, 2014; Chung & Shin, 2010; Hair et al., 2019). This finding means that the variables used in this study are very reliable. Also, the corrected item-total correlation coefficients of items were from 0.58 to 0.80, exceeding the threshold of 0.5 (Kim & Stoel, 2004). This result means that the questionnaire items are strongly correlated. Hence, this finding is another evidence of the reliability of the variables used in this study.

Table 5. Cronbach's alpha and corrected item-total correlation of variables

	Variables											
	Performance expectancy (PE)		**Effort expectancy (EE)**		**Social influence (SI)**		**Facilitating conditions (FC)**		**Behavioral intention (BI)**		**Usage behavior (UB)**	
Cronbach's alpha	0.89		0.88		0.83		0.84		0.83		0.81	
Is Cronbach's alpha exceeded the cut-off point of 0.7?	Yes		Yes		Yes		Yes		Yes		Yes	
Corrected item-total correlation	PE1	.80	EE1	.74	SI1	.60	FC1	.60	BI1	.64	UB1	.62
	PE2	.75	EE2	.73	SI2	.66	FC2	.70	BI2	.69	UB2	.65
	PE3	.79	EE3	.76	SI3	.72	FC3	.73	BI3	.68	UB3	.58
	PE4	.74	EE4	.71	SI4	.68	FC4	.66	BI4	.64	UB4	.64

4.4. Pearson correlation test

Using the model in Figure 1, Table 6 shows Pearson correlation coefficients between independent, intermediate, and dependent variables. The results showed that the correlation coefficients were 0.14 - 0.47. However, the Pearson correlation tests between variables PE and BI, EE and BI, and SI and BI yielded *p*-values of 0.03, 0.002, and 0.005, respectively. Similarly, the Pearson correlation test between variables FC and UB and BI and UB yielded *p*-values of 0.000. These *p*-values are less than the critical significant level of 5%. Therefore, these findings mean that correlations between variables exist.

Table 6. Pearson correlation coefficient between variables and corresponding p-value of correlation test

		BI	**UB**
PE	Correlation coefficient	0.14	
	p-value	0.03	
EE	Correlation coefficient	0.20	
	p-value	0.002	

SI	Correlation coefficient	.18	
	p-value	0.005	
FC	Correlation coefficient		.27
	p-value		.000
BI	Correlation coefficient		.47
	p-value		.000

4.5. Confirmatory factor analysis (CFA)

This study employed the CFA (DiStefano & Hess, 2005) using model fit and construct validity tests to examine the variable structure and relationship between variables in the model, as in Figure 1.

4.5.1. Model fit test

Table 7 shows four model fit test criteria (Byrne, 2001; Carmines & McIver, 1981; Hair et al., 2019; Hu & Bentler, 1999; Sun, 2005), including the ratio of chi-square to degrees of freedom (chi-square/d.f.), goodness of fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The results showed that the chi-square/df was 1.256, less than the cut-off point 2. Similarly, GFI and CFI were 0.956 and 0.977, respectively, greater than the cut-off point 0.95. Lastly, RMSEA was 0.033, less than the cut-off point of 0.08. Hence, these findings mean that the model, as in Figure 1, fits the observed data well

Table 7. The model fit test statistic and cut-off point

Criteria	Statistic	Cut-off point	Is the statistic less than the corresponding cut-off point?
Chi-square/d.f.	1.256	Less than 2 or 3	Yes
GFI	0.906	Greater than or equal to 0.9	Yes
CFI	0.977	Greater than or equal to 0.95	Yes
RMSEA	0.033	Less than 0.06	Yes

4.5.2. Validity test

To assess variable validity, we examined convergent validity using composite reliability (CR) and average variance extracted (AVE) (Fornell & Larcker, 1981; Hair et al., 2019; Henseler et al., 2015; Netemeyer et al., 2003). Table 8 shows the CR and AVE. The results showed that the CRs of variables were 0.807 – 0.897, exceeding the threshold of 0.8. Also, the AVE ranged from 0.511 – 0.686, exceeding the threshold of 0.5. So, these findings support the convergent validity of the measurement model.

Table 8. Convergent test statistic and cut-off point

Variables	CR	Threshold of 0.8	Is CR greater than the corresponding threshold of 0.8?	AVE	Threshold of 0.5	Is AVE greater than the corresponding threshold of 0.5?
PE	0.897	0.8	Yes	0.686	0.5	Yes
EE	0.876	0.8	Yes	0.639	0.5	Yes
SI	0.836	0.8	Yes	0.562	0.5	Yes
FC	0.841	0.8	Yes	0.571	0.5	Yes
BI	0.834	0.8	Yes	0.557	0.5	Yes
UB	0.807	0.8	Yes	0.511	0.5	Yes

This study also examined the construct validity using discriminant validity of items of variables using AVE and maximum shared variance (MSV); the AVE and inter-variable squared correlations (Hair et al., 2019; Henseler et al., 2015; Netemeyer et al., 2003). Table 9 shows the AVE and MSV of each variable. The results showed that the MSV was less than the corresponding AVE for each variable. Specifically, the variable PE's MSV of 0.17 was less than the corresponding AVE of 0.586. Variable EE's MSV of 0.17 was less than the corresponding AVE of 0.639. Variable FC's MSV of 0.317 was less than the corresponding AVE of 0.571. Variable SI's MSV of 0.317 was less than the corresponding AVE of 0.562. Variable BI's MSV of 0.319 was less than the corresponding AVE of 0.557. Similarly, variable UB's MSV of 0.319 was less than the corresponding AVE of 0.511. In addition, Table 10 shows the AVE and the correlation matrix. These results showed that variable PE's AVE of 0.686 exceeded 0.412^2, 0.140^2, 0.256^2, 0.158^2, and 0.031^2, the squared correlation coefficient between PE and EE, PE and FC, PE and SI, PE and BI, and PE and UB, respectively. Similarly, variable EE's AVE of 0.639 was greater than 0.412^2, 0.263^2, 0.330^2, 0.227^2, and 0.110^2, the squared correlation coefficient between EE and PE, EE and FC, EE and SI, EE and BI, and EE and UB, respectively. Similar results held for variables FC, SI, BI, and UB. Hence, these findings support the discriminant validity of the measurement model.

Table 9. Discriminant Validity Coefficients

Variable	AVE	MSV	Is MSV less than the corresponding AVE
PE	0.686	0.17	Yes
EE	0.639	0.17	Yes
FC	0.571	0.317	Yes
SI	0.562	0.317	Yes
BI	0.557	0.319	Yes
UB	0.511	0.319	Yes

Table 10. AVE and correlation matrix

Variable	AVE	PE	EE	FC	SI	BI	UB
PE	0.686	1.00					
EE	0.639	0.412	1.00				
FC	0.571	0.140	0.263	1.00			
SI	0.562	0.256	0.330	0.563	1.00		
BI	0.557	0.158	0.227	0.506	0.211	1.00	
UB	0.511	0.031	0.110	0.328	0.101	0.565	1.00

4.5.3. Structural equation modeling

Next, this study employed structural equation modeling (SEM) (Hair et al., 2019; Fan et al., 2016), as shown in Figure 2, to analyze the structural relationship between measured variables and latent constructs of the model, as in Figure 1.

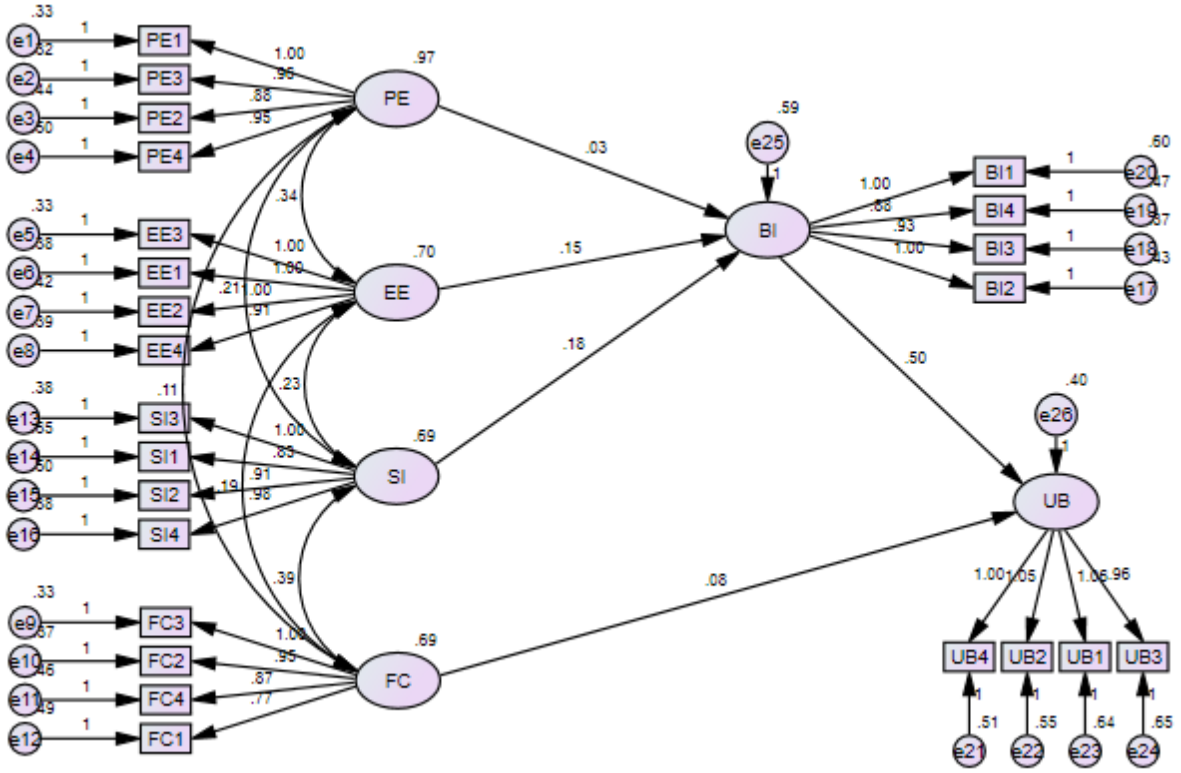

Figure 2. The structural relationship of the model

Table 11 shows the hypothesis testing of the model, as in Figure 1, using the SEM technique. The results showed that for hypothesis H1: PE → BI, the weight was 0.03, and the corresponding p-value of 0.632 (63.2%). This finding means that the H1 is not significant at the level of 10%. So, the causal relationship in H1 does not exist. This conclusion is not consistent with other studies (Abbad, 2021; Chao, 2019; Sumak et al., 2010; Sung et al., 2015). Similarly, for hypothesis H4: FC → UB, the weight was 0.08, and the corresponding *p*-value of 0.213 (21.3%). This finding means that the H4 is insignificant at 10%. So, the causal relationship does not exist in H4. This conclusion is not consistent with other studies (Fathema et al., 2015; Khechine et al., 2020; Taylor & Todd, 1995). The possible reason for the difference in conclusions from H1 and H4 between this study and others is that online education is not a preferred format compared to traditional classroom education in the Vietnamese higher education system. So, Vietnamese higher institutions do not make a good investment in online education infrastructure and training. Also, most Vietnamese undergraduates were not used to online education until the COVID-19 pandemic spread. Another possible reason is that other studies were conducted in more developed countries such as Korea, Taiwan, and European countries where higher education environments are not the same as in Vietnam.

For hypothesis H2: EE → BI, the weight was 0.15, and the corresponding *p*-value was 0.081 (8.1%). This finding means that the H2 is significant at the level of 10%. So, the causal relationship exists in H2. This conclusion aligns with another study (Abbad, 2021). For hypothesis H3: SI → BI, the weight was 0.18, and the corresponding *p*-value was 0.025 (2.5%). This finding means that the H3 is significant at the level of 5%. So, the causal relationship exists in H3. This conclusion aligns with other studies (Raman et al., 2014; Sumak et al., 2010; Sung et al., 2015). Similarly, for hypothesis H5: BI → UB, the weight was 0.50, and the corresponding *p*-value was 0.000 (0%). This finding means that the H5 is significant at the level of 1%. So, the causal relationship exists in H5. This conclusion aligns with another study (Sumak et al., 2010).

Table 11. The hypothesis testing using SEM

Hypothesis	Weight	*p*-value	Conclusion
H1: PE → BI	0.03	0.632	No causal relationship
H2: EE → BI	0.15	**0.081 (*)**	Causal relationship exists
H3: SI → BI	0.18	**0.025 (**)**	Causal relationship exists
H4: FC → UB	0.08	0.213	No causal relationship
H5: BI → UB	0.50	**0.000 (***)**	Causal relationship exists

Notes: *: significant al the level of 10%
**: significant at the level of 5%
***: significant at the level of 1%

5. CONCLUSIONS

With the development of technology today, online education is proliferating, especially during the pandemic period such as COVID-19. Many studies show the benefits of online compared with traditional classroom education. These benefits include efficiency, flexibility, safety, affordability, and accessibility. However, what makes online education exciting and valuable and influences student acceptance is only sometimes clear. In addition, as the COVID-19 pandemic is over, most higher education institutions worldwide have reverted to the traditional classroom education mode.

This study examines the determinants of online education technology acceptance among Vietnamese undergraduates. Using the UTAUT-typed model, stratified probability sampling method, the survey technique, 232 valid Vietnamese undergraduates as respondents, reliability and Pearson correlation tests, confirmatory factor analysis, and SEM, this study shows that the performance expectancy is not statistically significant in affecting the Vietnamese undergraduates' behavioral intentions related to online education technology acceptance. Also, the facilitating conditions are not statistically significant in affecting usage behavior. However, effort expectancy and social influence are statistically significant and positively affect Vietnamese undergraduates' behavioral intentions. Further, the empirical result also supports behavioral intention's positive and significant impact on usage behavior.

All these findings provide insights into Vietnamese undergraduates' behavioral intentions related to online education technology acceptance in higher education. They can help educators gain further knowledge of students' needs and then invest more in education technology for the success of their students and institutions. Also, higher education institutions are encouraged to spend more time and resources to train their students using technology to boost their online education acceptance.

This study focuses on Vietnamese undergraduates. However, there are significant differences between Vietnam's and other developed countries' higher education systems in terms of infrastructure, technology investment, curriculums, and human resources. These differences may lead to different findings between this study and others in the Literature Review. Also, this study only uses the data size of 232 respondents who go to universities in metropolitan areas. Therefore, we will include the students who go to universities in rural areas and enlarge the sample size in our subsequent study.

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