

# Factors influencing the intention to continue online learning of students at Tra Vinh university in Vietnam

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## *Abstract:*

**R**esearch on factors affecting students' intention to continue studying online at Tra Vinh University. Research on applying the technology acceptance model (TAM), successful information system model (ISS), and student satisfaction. Survey data from 312 students studying at the school are used. Structural Modeling (SEM) evaluates and validates the model. The results show that the quality of information, techniques - technology, interaction in the E-learning environment, perceived usefulness, lecturers, and learners themselves indirectly affect the intention to continue learning online through satisfaction. Management implications are also suggested, creating a basis for developing an E-learning system appropriate to the school and increasing students' intention to continue learning online.

**Keywords:** *ISS, student satisfaction, TAM, intent to continue online learning.*

## 1. Introduction

The fourth industrial revolution is causing strong and significant changes in most fields, and the education sector is no exception to that trend. The transformation of education from traditional to online and mobile learning is a clear reflection of the change and progress of information technology in education. In particular, in the context of the COVID-19 pandemic spreading around the world, online learning has become a popular trend to minimize the spread of the virus. According to Pham Tat Phong (2023), "Online learning is a necessity when transforming the education and

training system. The trend of online learning is soon seen in countries such as the United States, Japan, India, England, Korea, South Africa, Malaysia, China... Now, moving classes online is a task that creates an increasingly popular training method, and that method leads to the formation of a culture of lifelong learning in a learning society". For example, in China, in February 2020, more than 220 million students had to switch to online learning (UNESCO, 2020). According to Citizen & Education Promotion newspaper (2023), in the United States, 80% of universities use online methods for training. In Japan, leading universities

such as Tokyo University, Kyoto University, Tokyo University of Technology, Osaka University... have opened many online OCW (Open Courseware) courses. These schools have their own websites dedicated to providing OCWs. In addition, they also have websites like Coursera or Udacity (online universities that help students who want to study at the world's top universities without the means). And in Malaysia and Singapore, Brunnei is also paying attention to converting face-to-face learning to online learning or combining these two forms of learning. They will format electronic lessons combined with teaching via television and radio.

The COVID-19 pandemic has also accelerated the development of E-learning in Vietnam in 2020. According to UNESCO (2020), the rate of online learners in Vietnam is 34%. At the same time, this educational model is now heavily focused on higher education through the school's website system (E-learning). The COVID-19 pandemic has created many challenges and opportunities for Vietnam's digital economy. Digital transformation has become even more urgent when the epidemic has changed the way business activities and communication in society are carried out. Therefore, the Government of Vietnam has recognized the importance of digital transformation to solve economic, social, and administrative problems in the context of the COVID-19 epidemic. Therefore, on June 26, 2020 decision number 749 was issued by the Prime Minister. In particular, it is worth noting that the content of digital transformation in the field of education should be given priority, second only to the health sector, with the goal that by 2025 "Development of a platform to support distance teaching and learning, thoroughly apply digital technology in management, teaching and learning; digitizing documents and textbooks; building a platform to share teaching and learning resources in both face-to-face and online forms. Developing technology for education, towards personalized training" Ministry of Education and Training (2020). In 2022, even though the stressful period of the pandemic has passed, Deputy Minister Nguyen Van Phuc still affirmed that digital technology is one of the three pillars of Vietnam's educational transformation.

However, there is a big challenge, Center for

Educational Communication (2022), Minister Nguyen Kim Son said that, when the COVID-19 pandemic broke out, new digital solutions became a must. Many universities in all provinces and cities across the country have promoted online teaching to meet the demand for quick and forced learning. That has made the online teaching process reveal many disadvantages such as high failure rate of online learning projects, low learning achievement of learners, and acceptance and satisfaction of students learning about online learning methods is low (Pham & Tran, 2018). In the new normal, when schools have reopened, many schools are at risk of returning to teaching and teaching traditional methods like before the pandemic. This is an inevitable consequence if efforts during the pandemic are merely to change the method of communication from face-to-face to online without the necessary conditions of infrastructure as well as a shift in thinking pedagogy and management. Therefore, this study will examine which factors influence the intention to continue studying online of students studying at the school. From there, some management implications are proposed to help improve the intention to continue studying online through the E-learning system of students at Tra Vinh University in the process of pursuing the goal of digital transformation.

## 2. Theoretical basis

### 2.1. The concept

#### 2.1.1. Online learning

From the previous definition by Selim (2007), Moore & Kearsley (2012), and Singh & Thurman (2019). E-learning can be understood in a general sense, which is a training process that uses electronic means, information technology, and communication to transfer and share knowledge among teachers and learners, removing the limitations of time and space.

#### 2.1.2. Intent to continue learning online

Combine the two definitions of satisfaction by Kotler & Keller (2009) and Hoyer & MacInnis (2001). The intention to continue learning online is that when learners feel satisfied when using online learning through the E-learning system, learners will tend to continue to choose and use this learning method in the future. Conversely, if learners feel unsatisfied with the online learning experience,

they will tend to stop using this form of learning

### 2.1.3. Learner

In the Education Law 2019 (Congressional, 2019), Article 80 stipulates the learners in the national education system, including from preschool, general education, colleges, and universities to graduate school. In this study, the focus is on a group of students who have experienced online learning or have the potential to participate in this type of learning. Choose to focus on this group because they represent a large proportion of high-quality human resources, which play an important role in bringing the country to development in all fields.

## 2.2. Theoretical research model

### 2.2.1. Technology Acceptance Model (TAM)

From the Theory of Reasoned Action (TRA), Davis (1989) formulated the Technology Acceptance Model (TAM) to specifically predict the adoption of information systems. This model aims to anticipate the likelihood of tool acceptance and identify system modifications required for enhanced user approval. TAM underscores that the acceptance of an information system hinges on two pivotal factors: perceived usefulness and perceived ease of use. Perceived usefulness denotes the system's potential to enhance work or life, while perceived ease of use reflects user expectations of system usage with minimal effort. These factors are influenced by external elements such as societal, cultural, and political factors. User attitude gauges how individuals perceive a specific application, while behavioral intention measures whether a user intends to adopt an application or not.

### 2.2.2. Information System Success (ISS)

The information system success model by DeLone & McLean (1992) examines six critical factors: system quality, information quality, use, user satisfaction, individual impact, and organizational impact. In their 2003 adjustment, DeLone and McLean emphasize quality and service quality. Quality comprises three main factors: information quality, system quality, and service quality. The model introduces 'intention to use' and removes 'individual impact' and 'organizational impact' replacing them with 'pure impact'. Additionally, they incorporate feedback loops between 'intention to use' and 'user satisfaction' into the model. In their 2016 update, DeLone and McLean identify issues with the roles of service quality and user satisfaction. They underscore that the success of an information system should be measured through the outcomes of the usage process, user perceptions, and the impact of the information system on individuals and businesses. Service quality is not a direct component of information system success, and user satisfaction is an outcome of the information system's success.

## 3. Hypotheses and research models

### 3.1. Research hypothesis

Information quality is concerned with the quality of an entity's output, Information quality usually involves the timeliness, scope, relevance, and accuracy of information generated by an information system (DeLone & McLean, 1992); Le Nam Hai & Tran Yen Nhi (2021) show that information quality is an important and interesting factor that has a significant impact on learner satisfaction, learners pay special attention to the learning system what information to provide, and

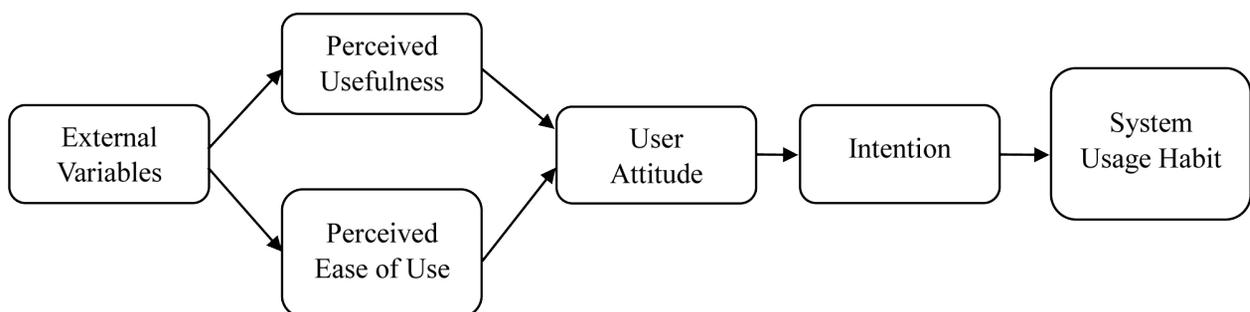


Figure 1. Technology Acceptance Model (TAM)

Source: Davis, 1989

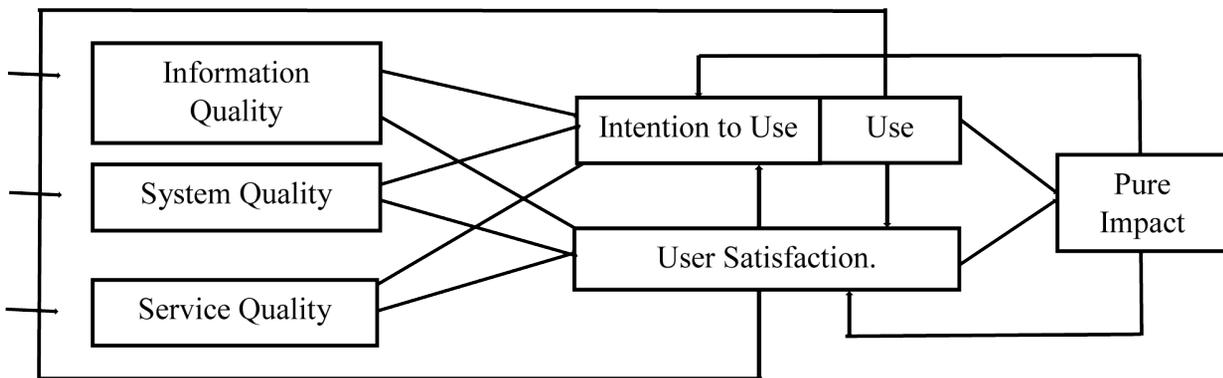


Figure 2. The Information System Success Model 2003 – Updated Version

Source: DeLone & McLean, 2016

whether that information is clear, understandable, and relevant. Therefore, the author proposes hypothesis H1.

*H1: Information quality has a positive influence on student satisfaction when using online learning through the E-learning system.*

Engineering - technology is the application of scientific discoveries to practical and specific goals or products for human life. Lack of experience or limited use of technologies will negatively affect students' perceptions and attitudes toward online learning (Forsyth et al., 2018). In other words, students expect the functions of the system to bring comfort and ease to users. In addition, page speed, transitions between websites, beautiful page design, and attractive content on the page also affect student satisfaction (Bui Tuyet Anh & Tran Hoang Cam Tu, 2021). Therefore, technology - technology is one of the most important factors affecting student satisfaction during online learning (Sharma, 2020). Hence hypothesis H2 is proposed.

*H2: Engineering - Technology has a positive influence on student satisfaction when using online learning through the E-learning system.*

Support services are activities and resources provided to assist students in participating in online learning, including academic advising, technical assistance, financial assistance, mental health, and other services to ensure a conducive and productive learning environment for students (UNESCO, 2020). According to research by Pham et al. (2019), the quality of online learning services is assessed through the aspect of support

services or administrative services and considered as a factor that has a positive influence on student satisfaction when using the service. Once students are supported quickly and timely in the process of using, it will create trust and satisfaction when the student's interests are concerned by the school (Le Nam Hai & Tran Yen Nhi, 2021). From there, the author proposes hypothesis H3.

*H3: Support services have a positive influence on student satisfaction when using online learning through the E-learning system.*

Online interaction is the process that takes place between learners and learning resources in an online environment. Online interactions occur between learners and instructors, peers, as well as learning materials, including online lectures, e-books, readings, assignments, etc. (Liu, 2010). According to Moore (1989), there are three types of interaction in learning activities: student-to-teacher, student-to-document, and student-to-student. Moore (1989), also pointed out that teaching style, especially the interaction between teachers and students, plays a decisive role in learning activities. Without a conspicuous interaction between the instructor and the student, learners are easily distracted and have difficulty concentrating on the content of the course. Therefore, hypothesis H4 is proposed.

*H4: Interaction in the E-learning environment has a positive influence on student satisfaction when using online learning through the E-learning system.*

Perceived usefulness is that users are interested in how an online learning system provides

information and the benefits or effects it provides (Roca et al., 2006; Sun et al., 2008). A study by Roca et al. (2006) has mentioned the perceived usefulness factor and the results achieved through the study are that usefulness has the greatest impact on satisfaction. When users find online learning helpful in acquiring the desired knowledge and skills, they are more likely to be satisfied and use the system for the long term. Therefore, the author proposes hypothesis H5.

*H5: Perceived usefulness has a positive influence on student satisfaction when using online learning through the E-learning system.*

A lecturer is a person who teaches, communicates with students in the classroom, manages the course and students in his class; and compiles lectures and exercises (Huynh De Thu, 2019). In addition, they are the facilitators and facilitators of students in the service learning process (Bui Kien Trung, 2016). Therefore, instructors must have both theoretical and practical knowledge, keep an eye on students' interests, and foster ongoing student interaction (Pham et al., 2019). If the lecturer knows how to organize and prepare for the class, create a comfortable learning environment, care about the class, maintain the class so that learners are not distracted, and convey communication skills that are if students agree, it will affect student satisfaction. Hypothesis H6 is proposed by the author.

*H6: Instructors have a positive influence on student satisfaction when using online learning through the E-learning system.*

According to research by Bui Tuyet Anh and Tran Hoang Cam Tu (2021), the learner's factor has a positive influence on student satisfaction. This can be explained because online learning requires students to work individually to achieve the requirements of the course. In other words, training activities now not only emphasize the role of the lecturer but also focus on the students themselves must have the ability to realize behavioral control in learning. According to Meryem Yilmaz Soylu (2014), when learners themselves have better behavioral control, they tend to score higher in exams and achieve better academic performance. At the same time, when an individual believes that he or she is capable of self-use and perceives the ease of use of computers and the internet, there will be a positive impact on

satisfaction when using e-learning (Roca et al. al., 2006). Therefore, hypothesis H7 is proposed by the author to test the impact of learners themselves on student satisfaction.

*H7: Learners themselves have a positive influence on student satisfaction when using online learning through the E-learning system.*

According to Chen et al. (2020), customer satisfaction is a state of contentment or disappointment formed by comparing the perceived performance of a product or service with the expected value. Based on Chen et al.'s (2020) definition, the author asserts that learner satisfaction plays a crucial role in the decision to continue online learning. When learners undergo a positive experience and achieve the expected outcomes from this learning modality, the resulting satisfaction not only provides immediate joy but also generates a strong motivation to sustain and develop positive behaviors. This implies that satisfaction is not merely an outcome of a positive state but also a confirmation that the decision to choose online learning is appropriate. Hoyer and MacInnis (2001) pointed out that when customers feel satisfied with the use of a product or service from a provider, they tend to continue selecting and using products and services they were satisfied with. Therefore, satisfaction can be seen as creating positive expectations for upcoming learning journeys and offering positive self-feedback. Furthermore, satisfaction diminishes concerns and psychological risks associated with continuing online learning. When learners feel satisfied and at ease, they exhibit higher motivation to continue their learning journey, establishing a positive cycle and emphasizing the intention to continue learning in the future. This comparison results in student satisfaction or dissatisfaction. From there, the author proposes the hypothesis H8.

*H8: Student satisfaction with online learning through the E-learning system has a positive impact on the intention to continue learning.*

### **3.2. Research models**

Based on previous successful models and studies of Nguyen Ngoc Hien & Nguyen Thi Hanh Uyen (2022); Le Nam Hai & Tran Yen Nhi (2021); Bui Tuyet Anh & Tran Hoang Cam Tu (2021); Darko et al. (2011); successful information systems model (ISS) by Delone & McLean (1992) and the

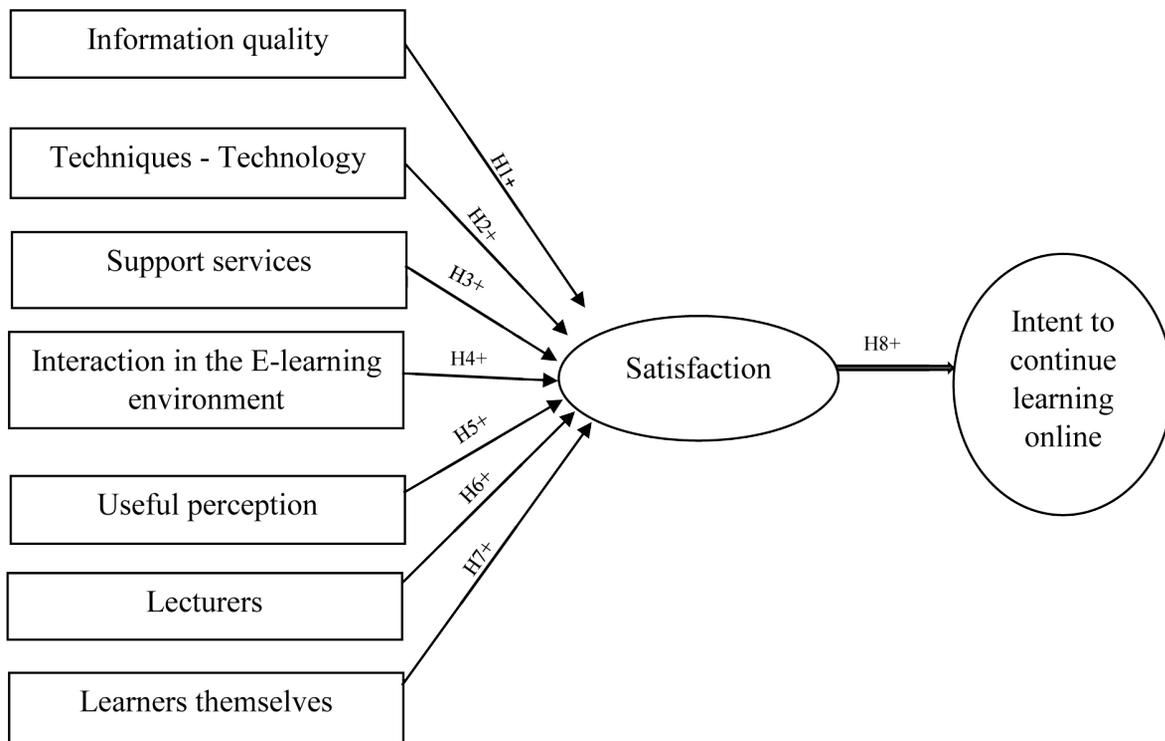


Figure 3. Proposed research model

Source: Author's proposal, 2023

Technology Acceptance Model (TAM) by Davis (1989).

The above information is a solid basis for forming the following proposed research model (Figure 3).

#### 4. Research Methods

##### 4.1. Qualitative research methods

The reviewed documents are the foundation for the proposed scale of the research model. The author builds a draft scale and interviews experts with a discussion outline including semi-structured questions to build and complete the scale of the factors in the research model. The survey questions were built with a 5-level Likert scale and tested with a sample of 100 people to check the participants' understanding of the question and detect errors in the questionnaire design. By using Cronbach's Alpha test, alpha coefficients  $< 0.6$  and total correlation less than 0.3 were eliminated (Nguyen Dinh Tho, 2011).

##### 4.2. Quantitative research methods

The survey in this study uses a sampling method based on the ratio of students between units of the school to ensure representation for the entire Tra Vinh University. Surveys were collected from 2nd and 3rd year students at the following 8 units: School of Economics, Law; School of Southern Khmer Language - Culture - Arts and Humanities; Faculty of Agriculture and Fisheries; Faculty of Medicine and Pharmacy; Faculty of Engineering and Technology; Department of Applied Chemistry; Faculty of Basic Sciences; Department of Dentistry. Different survey sampling methods can be used depending on the number of observed variables and the reliability of each study (Comrey & Lee, 2013). In this study, a sample size of 312 is considered appropriate to test the reliability of the scale (Cronbach's Alpha) and conduct exploratory factor analysis (EFA), as well as perform linear SEM (Comrey & Lee, 2013). The questionnaire consists of two parts: the first part states the general characteristics of the participants, including full

**Table 1. Summary of the scale**

No.	Code	The scale	Expected	Resources
<b>I Information quality</b>				
1	TT1	Online learning service that provides easy-to-understand information for me		
2	TT2	Information from the E-learning service is always updated for my purposes		
3	TT3	The reliability of information output from E-learning services is high		
4	TT4	Online learning service that provides the information I need in a timely manner	+	Roca et al. (2006); Pham et al. (2019); Le Nam Hai & Tran Yen Nhi (2021)
5	TT5	The E-learning service provides complete information for my purposes		
6	TT6	The website of the online course provides me with valuable information		
<b>II Techniques - Technology</b>				
7	CN1	Easy-to-use online learning app		
8	CN2	Graphics devices such as sound, quality application PPT		
9	CN3	Stable connection speed (Internet/data)		
10	CN4	I easily do what I want to do on the online learning service system	+	Sharma et al. (2020); Dinh Thi Hong Gam (2022); Roca et al. (2006); Pham et al. (2019); Le Nam Nam Hai & Tran Yen Nhi (2021); Wu et al. (2008);
11	CN5	The arrangement of information displayed on the interface of the E-learning system is very clear		
12	CN6	I feel safe providing confidential information to the site		
<b>III Support Services</b>				
13	DV1	For my online learning, my university has an online learning support service at first use		
14	DV2	For my online learning, the support service at the university will let me know exactly when my requests will be fulfilled.		
15	DV3	For my online learning, my university support service provides me quick support	+	Pham et al. (2019); Le Nam Hai & Tran Yen Nhi (2021)
16	DV4	For my online learning, my university support service always understands my specific needs		
17	DV5	For my online learning, my university support service has convenient hours of operation		
<b>IV Interaction in the E-learning environment</b>				
18	MT1	Interacting with other students and instructors using a web-based learning system became more natural as the course progressed		
19	MT2	The instructor often elicits student interaction		
20	MT3	I have a response to a classmate's statement		
21	MT4	Classmates give feedback to my comments	+	Arbauhg (2000); Darko et al. (2011); Thach et al. (2021); Ngo & Ngadiman (2021), Gray & DiLoreto (2016), Kuo et al. (2014); Dinh Thi Hong Gam (2022);
22	MT5	I often exchange (lessons, group discussions, group exercises,...) with other students in the class.		
23	MT6	I answer the teacher's questions during the study		

V		Useful perception	
24	HI1	Using an E-learning service can improve my academic performance	+ Roca et al. (2006); Tahrini et al. (2013); Mohammadi (2015); Le Nam Nam Hai & Tran Yen Nhi (2021); Padilla-Meléndez et al. (2013) Wu & Liu (2013); Nguyen Thi Minh Nghia & Tran Huu Tuan (2021);
25	HI2	Using an online learning service saves me time	
26	HI3	Using an online learning service helps me save money	
27	HI4	Many exercises can be done in an online learning environment as an alternative to traditional classrooms	
28	HI5	Study materials and activities in the E-course helped me to study effectively	
VI		Lecturers	
29	GV1	Instructors are knowledgeable and knowledgeable about the course	+ Ali & Ahmad (2011), Eom et al. (2016), Sharma et al. (2020); Dinh Thi Hong Gam (2022); Pham et al. (2019); Sun et al. (2008); Roca et al. (2006); Le Nam Hai & Tran Yen Nhi (2021); Nguyen Thi Hoa et al. (2021)
30	GV2	The teacher cares about my learning in the classroom	
31	GV3	My E-learning instructors have expert knowledge	
32	GV4	My online learning instructors are well prepared and well organized for the courses	
33	GV5	Instructors are very enthusiastic about teaching online	
34	GV6	Instructors advise me whenever needed	
VII		Learners themselves	
35	NH1	I can use the Moodle E-learning system without much assistance	+ Wu and Liu (2013); Wu et al. (2010); Nguyen Thi Minh Nghia & Tran Huu Tuan (2021); Eom et al. (2016), Sharma et al. (2020); Dinh Thi Hong Gam (2022); Roca et al. (2006); Sun et al. (2008); Wu et al. (2008); Le Nam Hai & Tran Yen Nhi (2021)
36	NH2	I have enough time to self-study, improve my self-study ability	
37	NH3	I can handle technical problems well while using the E-learning system without much assistance.	
38	NH4	I worked hard to study in online courses like face-to-face	
39	NH5	I feel confident when exchanging information with others in online learning discussion forums	
40	NH6	I feel confident downloading materials from the e-learning service	
VIII		Satisfaction	
41	HL1	Online learning has the same quality as traditional learning	+ Eom et al. (2016); Kuo et al. (2014); Dinh Thi Hong Gam (2022); Roca et al. (2006); Sun et al. (2008); Le Nam Nam Hai & Tran Yen Nhi (2021)
42	HL2	I am satisfied with the performance achieved from the E-learning service	
43	HL3	I am satisfied with the experience of using the online learning service	
44	HL4	The online class met my expectations	
IX		Intent to continue learning online	
45	YD1	If given the choice, I will continue to take the online course in the study program	+ Guo et al, (2016); Wu and Chen (2017); Nguyen Ngoc Hien & Nguyen Thi Hanh Uyen (2022); Nguyen Thi Lien Huong et al. (2022)
46	YD2	I continue to take online courses to enrich my knowledge	
47	YD3	I will recommend to my friends to use the E-learning system.	
48	YD4	I look forward to my continued use of the online system in the future	

Source: Author's compilation, 2023

**Table 2. Checking the reliability of the scale**

Factors	Observed variables	Number of observations	Cronbach's Alpha
Information quality	TT1, TT2, TT3, TT4, TT5, TT6	5	0,860
Technology	CN1, CN2, CN3, CN4, CN5, CN6	5	0,884
Support Services	DV1, DV2, DV3, DV4, DV5	5	0,842
Interaction in E-learning environment	MT1, MT2, MT3, MT4, MT5, MT6	5	0,868
Useful perception	HI1, HI2, HI3, HI4, HI5	5	0,838
Lecturers	GV1, GV2, GV3, GV4, GV5, GV6	5	0,869
Learners themselves	NH1, NH2, NH3, NH4, NH5, NH6	5	0,863
Satisfaction	HL1, HL2, HL3, HL4	5	0,837
Intent to continue learning online	YD1, YD2, YD3, YD4	5	0,861

Source: Author's survey results, 2023

name, gender and affiliated units. The second part includes 48 survey variables corresponding to seven factor groups, Hair et al. (2006) said that for linear structural regression analysis (SEM), a sample size ranging from 200-400, corresponding to 10-15 factors, is appropriate.

## 5. Results and discussion

### 5.1. Cronbach's Alpha coefficient analysis

The reliability of 48 observed variables was evaluated by Cronbach's Alpha coefficient. The results as shown in Table 2 show that all measured variables ensure the standard reliability of  $\geq 0.6$  as suggested by Nunnally and Burnstein (1978) and Peterson (1994); The correlation coefficient of the total variable of each component  $> 0.3$  (Nguyen Dinh Tho, 2013). Therefore, all 48 observed variables were kept for the next step of exploratory factor analysis (EFA).

### 5.2. Exploratory factor analysis (EFA)

Carrying out exploratory factor analysis for the scale of independent variables, the results of the final analysis show that all statistical parameters are satisfactory. Specifically, with 40 observed variables the Kaiser-Meyer-Olkin index (KMO) was found to be  $0.820 > 0,5$ , showing that the analysis is appropriate and statistically significant sig. value in Bartlett's test  $< 0.05$  is 0,000 showing that the items are related to each other. Factor loading coefficients are all greater than 0,5 and there is no case that a variable loads simultaneously on many factors. The Eigenvalue index of all factors is high, with the lowest value being  $2.239 > 1$ , so 7 extracted factors

have the best information summary meaning. At the same time, the total variance extracted was 59.087%, which is 50% higher than the satisfactory threshold, showing that these 7 factors can explain 68.967% of the variability of the data. This ensures the convergent and discriminant validity of the factors in the EFA analysis, as shown in Table 3.

### 5.3. Confirmatory factor analysis

The CFA results for the research model have  $p = 0.000$ , the value of Chi-square ( $\chi^2$ ) is 1427.361 with 874 degrees of freedom (df), CMIN/df is  $1.633 < 3$ , RMSEA =  $0.045 < 0.06$ , GFI =  $0.829 > 0.8$ , TLI =  $0.915$  and CFI =  $0.908$  all exceeded the recommended threshold of 0.9. These indicators show that the scale is discriminatory and reliable.

### 5.4. SEM - Structural Equation Model testing

After the structures are evaluated through the measurement model, the next structural model is used to test the research hypotheses. The indices satisfy the following criteria: CMIN/df =  $1.563 \leq 5$  (Bentler & Bonett, 1980), CFI =  $0.920 > 0.9$ , TLI =  $0.914 > 0.9$  and RMSEA =  $0.04$ . Furthermore, the estimated coefficients for all the parameters in the model are statistically significant at the 5% level, proving that the measurement model is consistent with the observed data. The results of the hypothetical model are illustrated in Figure 5.

To test the research hypothesis, we calculated the necessary statistical information from the Estimation spreadsheet, presented in Table 4 as follows:

The test results in Table 4 show that the rejected

**Table 3. Exploratory factor analysis**

	Factors						
	1	2	3	4	5	6	7
CN4	0.839						
CN3	0.824						
CN1	0.810						
CN2	0.793						
CN5	0.768						
CN6	0.731						
MT5		0.822					
MT3		0.808					
MT4		0.765					
MT2		0.698					
MT6		0.697					
MT1		0.677					
TT2			0.768				
TT1			0.765				
TT4			0.751				
TT3			0.747				
TT6			0.736				
TT5			0.733				
NH4				0.773			
NH3				0.761			
NH2				0.738			
NH1				0.737			
NH5				0.730			
NH6				0.633			
DV4					0.847		
DV3					0.803		
DV2					0.788		
DV5					0.750		
DV1					0.646		
HI3						0.803	
HI2						0.781	
HI4						0.779	
HI5						0.775	
HI1						0.722	
GV1							0.721
GV2							0.720
GV5							0.720
GV4							0.719
GV6							0.672
GV3							0.640

Chi-square=1427.361; df=874; P=.000  
 Chi-square/df=1.633  
 GFI=.829; CFI=.915; TLI=.908  
 RMSEA=.045  
 PCLOSE=.973

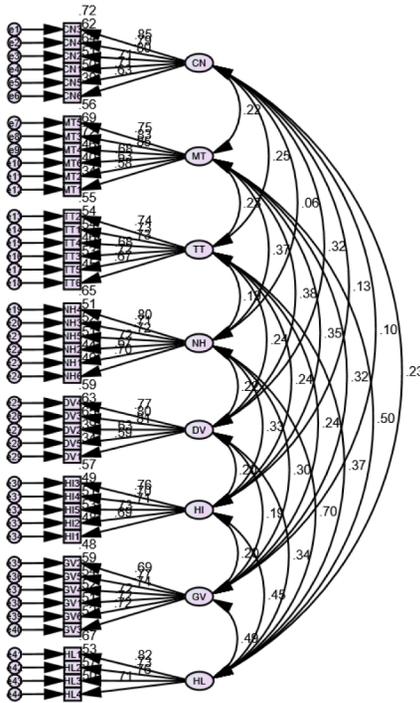


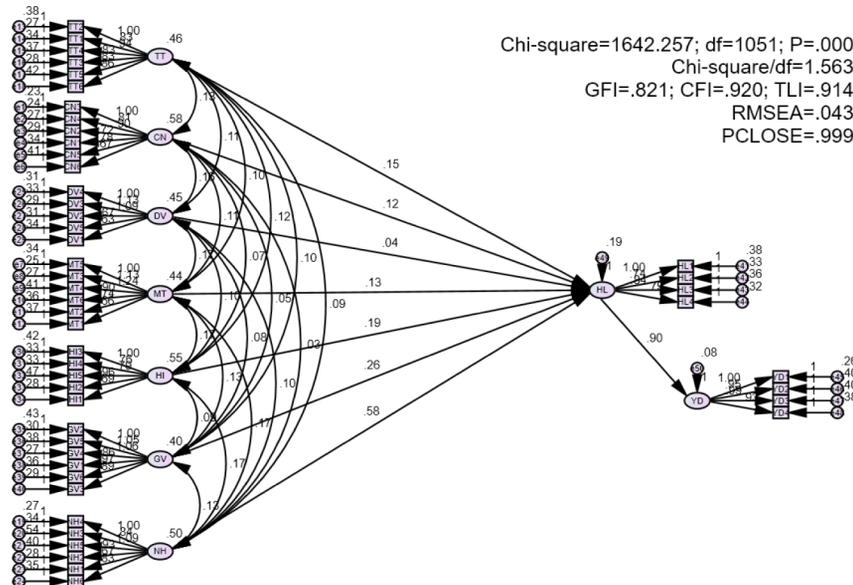
Figure 4. CFA results for the model

hypothesis is H3 ( $\beta_1 = 0,038, p = 0,516 > 0,05$ ) support services have no significant impact on student satisfaction with the image. E-learning mode. The remaining hypotheses' P-values are  $< 0,05$ , and the normalized and unnormalized coefficients are consistent with the original hypothesis, so the remaining hypotheses are accepted.

The research results are almost identical and support the results of previous studies, the factors of information quality, technique - technology, interaction in the E-learning environment, perceived usefulness, teaching students, learners themselves, and satisfaction have an influence on students' intention to continue learning online through the E-learning system. Particularly, the supporting service factor has the opposite effect, which is a remarkable difference in the results of this study.

### 5.5. Test the theoretical model estimate with Bootstrap

An experiment using the bootstrap method was performed through 780 iterations to determine the standard deviation and error of the difference between the bootstrap estimate and the maximum likelihood (ML) estimate. The results showed that



Chi-square=1642.257; df=1051; P=.000  
 Chi-square/df=1.563  
 GFI=.821; CFI=.920; TLI=.914  
 RMSEA=.043  
 PCLOSE=.999

Figure 5. SEM linear structure model

Source: Author's data processing, 2023

Table 4. Results of hypothesis testing

Hypotheses	Observed variables		Unnormalized UL ( $\beta_1$ )	Normalized UL ( $\beta_2$ )	SE	CR	p-value	Result
H1	Satisfaction	← Information quality	0,148	0,126	0,056	2,648	0,008	Accept
H2	Satisfaction	← Techniques -Technology	0,123	0,118	0,048	2,562	0,010	Accept
H3	Satisfaction	← Support Services	0,038	0,032	0,058	0,650	0,516	Rejected
H4	Satisfaction	← Interaction in the E-learning environment	0,133	0,111	0,063	2,109	0,035	Accept
H5	Satisfaction	← Useful perception	0,186	0,174	0,054	3,456	***	Accept
H6	Satisfaction	← Lecturers	0,262	0,209	0,062	4,220	***	Accept
H7	Satisfaction	← Learners themselves	0,548	0,518	0,065	8,944	***	Accept
H8	Intention to continue learning	← Satisfaction	0,901	0,929	0,061	14,658	***	Accept

Table 5. Bootstrap estimate results compared with ML estimate

Parameter			Bootstrap estimation			Disparity		CR
			SE	SE-SE	Mean	Bias	SE-Bias	
Satisfaction	←	Information quality	0.055	0.001	0.125	-0.001	0.002	- 0.5
Satisfaction	←	Techniques -Technology	0.046	0.001	0.118	0.000	0.002	0
Satisfaction	←	Interaction in the E-learning environment	0.065	0.002	0.110	-0.001	0.002	-0.5
Satisfaction	←	Useful perception	0.048	0.001	0.176	0.002	0.002	1
Satisfaction	←	Lecturers	0.067	0.002	0.206	- 0.002	0.002	-1
Satisfaction	←	Learners themselves	0.074	0.002	0.519	0.001	0.003	0.3
Intention to continue learning	←	Satisfaction	0.021	0.001	0.929	0.000	0.001	0

Source: Author's data processing, 2023

there was no statistically significant difference at the significance level below 0,05.

The results of the bootstrap test show that the CR index meets the requirements, with most of the absolute values of CR being below 2.0. This shows the reliability of the estimates in the research model.

## 6. Conclusion and managerial implications

### 6.1. Conclusion

This study has elucidated the factors contributing to the intention to continue studying online of students of Tra Vinh University through the proposed and tested research model. Through analyzing the relationship between factors to the intention to continue learning online based on the satisfaction of learners, the results show that the quality of information, techniques - technology, interaction in

the E-learning environment, perceived usefulness, lecturers, learners themselves, and satisfaction are the factors that positively and significantly affect the intention to continue learning through the E-learning system. These findings have practical implications for management, school leaders, and everyone else working to improve student satisfaction and intent to continue learning online. However, the study also noted some limitations. Research subjects focus on students, while lecturers and graduate students also participate in the E-learning course. Therefore, future research needs to supplement these groups. In addition, the discovery of factors affecting students' intention to continue learning through the E-Learning system in addition to the seven identified factors should be conducted at different universities.

## 6.2. Management implications

Based on the standardized regression coefficient in Table 4, it can be determined that the learners themselves has the most significant impact on student satisfaction in online learning ( $\beta_2 = 0.518$ ). This research result aligns with the findings of Hien & Uyen (2022), Anh & Tu (2021), and Hai & Nhi (2021). To sustain this factor, educational institutions should encourage and support students in developing responsibility and self-management skills. Enhancing the development and provision of training courses and support activities helps students cultivate time and financial management skills, from prioritizing learning to maintaining a balance between academic and extracurricular activities. Creating opportunities for students to connect and interact with each other through online forums, educational events, and study groups is essential. Encouraging collaboration among students allows them to share experiences and provide mutual support.

The factor exerting the second-largest influence, following the learners themselves, is the lecturers ( $\beta_2 = 0.209$ ). This outcome is consistent with the research conducted by Hong Gam (2022), Hai & Nhi (2021), Carmen et al. (2021), and Siti et al. (2022). Consequently, the institution should develop a strategy to equip instructors with the requisite knowledge of information technology and its applications in online education. This ensures that instructors are proficient and can provide timely support to students in addressing technical issues that may arise during the learning process. Furthermore, educators should employ a variety of teaching and assessment methods to maintain student engagement in the online learning environment.

Next, ensuring the significant impact of useful perception ( $\beta_2 = 0.174$ ) for students during online learning plays a crucial role in creating a positive learning environment. This can be achieved by developing highly applicable learning content, guiding students in applying knowledge to real-life scenarios. Moreover, ensuring that courses provide practical value will help students better perceive the applicability of knowledge in their daily lives. This approach aims to enhance students' engagement and motivation, as indicated by previous studies (Roca

et al., 2006; Sun et al., 2008; Hai & Nhi, 2021). Therefore, educational institutions should focus on constructing learning materials with high practical utility, emphasizing the application of knowledge to real-world situations. It is essential to ensure that the courses offered deliver tangible value to students, enabling them to recognize the relevance of their learning to everyday life. This strategic approach contributes to fostering a learning environment that not only imparts theoretical knowledge but also emphasizes its real-world applicability.

In terms of information quality ( $\beta_2 = 0.126$ ), educational institutions ought to bolster the oversight and management of learning content. Supporting educators in crafting high-quality materials and ensuring the accuracy of information is pivotal. Moreover, fostering diversity in information sources and materials enriches the learning experience, enabling students to access information from various outlets, thereby enhancing the richness and authenticity of knowledge. This strategy contributes to cultivating a learning environment that not only imparts theoretical knowledge but also emphasizes the practical application of information.

To improve the aspects of techniques and technology ( $\beta_2 = 0.118$ ), institutions can invest in technical infrastructure to ensure optimal information transmission speed and system interactivity. Furthermore, providing guidance on the easy and effective utilization of technical tools for students is crucial to optimize the online learning experience. This approach aims to create a seamless and user-friendly technological environment that facilitates students' engagement and interaction in the online learning process.

Concerning interaction in the E-learning environment ( $\beta_2 = 0.111$ ), institutions can promote student engagement in interactive activities like discussion forums, online classes, or group discussions. Creating an open and flexible learning environment will stimulate the exchange of ideas and build connections between students and educators, ensuring they feel supported and involved throughout the learning journey. This approach emphasizes the importance of collaborative learning and active participation in the virtual space, contributing to a more dynamic and enriching educational experience.

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