

# 베트남-한국 우호 정보기술대학 이러닝 수용성 분석

## Analysis of E-learning Acceptance in Vietnam-Korea Friendship Information Technology College

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### 요 약

베트남-한국 우호 정보기술대학의 이러닝(E-Learning) 교육 품질 향상을 위하여, 잘 알려진 기술수용모델(TAM)에 기반한 이러닝 수용성 평가를 수행하였다. 총 158명의 강사 및 직원으로부터 설문지를 통하여 데이터를 확보했으며, 통계패키지 SPSS를 이용하여 분석하였다. 설문지 작성 시는 다양한 이전 연구 결과를 고려하였으며, 그에 따라 연구 가설 및 모델을 설정하였다.

그 결과, 이러닝 시스템의 성공모델을 세웠으며, 중요 요소를 파악했다. 아울러 강사 및 직원들이 이러닝 시스템의 혜택을 잘 알고 있으며 그들의 훈련 및 교육에 이러닝 방법을 적용하고자 준비가 되었음을 파악했다.

### ABSTRACT

To improve the e-learning education quality in VietHanIT College (Vietnam-Korea Friendship Information Technology College), e-learning acceptance was evaluated based on the well-known Technology Acceptance Model (TAM). Quantitative data of the questionnaire survey were gathered from 158 lecturers and staffs of VietHanIT College and analyzed by using Statistical Package for the Social Sciences (SPSS). While designing the questionnaire various previous studies were considered and hypotheses and models of the study were set up accordingly.

As the results, success model of e-learning system was built up and important factors were identified. And most of lectures and staffs in VietHanIT College were aware of the benefits of e-learning system and they were ready to apply e-learning method for their training and teaching.

**Key Words:** E-learning, TAM, Perceived usefulness, Perceive ease of use, Behavioral intention use

## 1. Introduction

E-learning is commonly referred to the intentional use of networked information and communications technology in teaching and learning. A number of other terms are also used

to describe this mode of teaching and learning.

They include online learning, virtual learning, distributed learning, network and web-based learning. Fundamentally, they all refer to educational processes that utilize information and communications technology to mediate

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asynchronous as well as synchronous learning and teaching activities.

We can define e-learning is an instruction delivered on a computer by way use of video tape, movies, CD-ROM, internet, or intranet with the following features: It includes content relevant to the learning objectives. It uses instructional methods to support learning. It uses media items such as words, sentences and pictures to deliver the content and teaching methods. It can be designed for self-study, established new knowledge and skills linked to individual learning goals and to improve organizational performance. E-learning has some systems:

- Technology-Based Training (TBT)
- Computer-Based Training (CBT)
- Web-Based Training (WBT)
- Online Learning/Training
- Distance Learning

This paper researches how to improve the education quality by e-learning system in VietHanIT College in Da Nang, Vietnam. The main purpose is to determine the impact of technology solutions on e-learning performance with four objectives as following: (1) What are the accessibility and usability issues in e-learning system? (2) How can access and usability issues be practically resolved? (3) What are the advantages of e-learning for users? (4) How can users understand the difficulty level of using e-learning?

The organization of this paper is as follows. In section 2, methodology, factors influence e-learning acceptance, research model and research hypothesis we used in this paper are presented. Session 3 presents data analysis we did and their results. In session 4, we draw the paper's conclusions.

## II. Methodology

This section shows the research framework pointed out the factors influencing to user's satisfaction. Followings are the key assumptions

and variables measured to demonstrate and evaluate the important influences on how to user's satisfaction using e-learning. Sampling, data collection and research methods including research model and hypothesis are discussed.

### 1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis based on Theory of Reasoned Action model of Fishbein and Ajzen [1] with additional two factors includes perceived ease of use and perceived usefulness. TAM is designed to examine user's acceptance a particular technology [2]. The original TAM model includes five factors: perceived ease of use, perceived usefulness, behavior intention, attitude, and actual use as in Fig. 1.

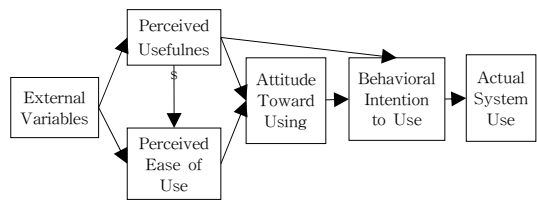


Fig. 1 Technology acceptance model

### 2. Factors Influence E-learning Acceptance in the College

#### 2.1 External Variables

External variables are as follows: instructor characteristics[3], technology characteristics[4], e-learning contents of e-learning[5], and learner e-learning self-efficacy[6]-[8].

#### 2.2 Internal Variables

Internal variables are as follows: perceived ease of use[2], perceived usefulness[2], attitude toward using e-learning[9], and behavioral intention to use e-learning[2].

### 3. Research Model

Based on the TAM model and factors influencing e-learning Acceptance in the college, we have the research model as in Fig. 2.

we have 8 Factors and 37 items as follows:  
 Factor Teaching Material (5 items)  
 Factor Internet connect quality (5 items)  
 Factor Learner e-learning self-Efficacy (5 items)  
 Factor e-learning content (8 items)  
 Factor Perceived ease of use (4 items)  
 Factor Perceived usefulness (4 items)  
 Factor Attitude toward Using e-learning (3 items)  
 Factor Intention to use e-learning (3 items)

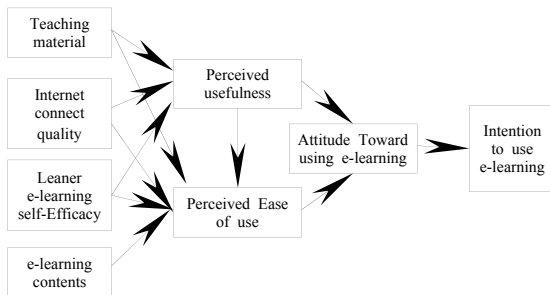


Fig. 2. Research model

#### 4. Research Hypothesis

Based on the research questions, factors influence e-learning acceptance, research model, we set the hypotheses for the research in table 1.

Table 1. Hypotheses

Research hypotheses
<b>Hypothesis 1:</b> Teaching material will have a positive effect to perceived usefulness of e-learning.
<b>Hypothesis 2:</b> Internet connect quality will have a positive effect to perceived usefulness of use of e-learning.
<b>Hypothesis 3:</b> The Learner e-learning self-Efficacy will have a positive effect to Perceived Usefulness of e-learning.
<b>Hypothesis 4:</b> Perceived ease of use will have a positive effect to Perceived Usefulness of e-learning.
<b>Hypothesis 5:</b> Teaching material will have a positive effect to Perceived Ease of use of e-learning.
<b>Hypothesis 6:</b> Internet Connect Quality will have a positive effect to Perceived Ease of use of e-learning.
<b>Hypothesis 7:</b> The Learner e-learning self-Efficacy will have positive affect to Perceived Ease of use of e-learning.
<b>Hypothesis 8:</b> e-learning contents will have a positive effect to Perceived Ease of use of e-learning.
<b>Hypothesis 9:</b> Perceived Usefulness will have a positive effect to Attitude toward Using e-learning of e-learning.
<b>Hypothesis 10:</b> Perceived Ease of Use will have a positive effect to Attitude toward Using e-learning of e-learning.
<b>Hypothesis 11:</b> Attitude toward Use will have a positive effect to Intention to use e-learning.

#### 5. Reliability Analysis

Before analyzing the relationship between factors,

it is important to ensure the reliability of the factors. Reliability of a factor can be determined based on the value of AVE or Cronbach's  $\alpha$  values. In this paper the Cronbach's  $\alpha$  value is used to measure reliability of factors including the behavior intention, attitudes, and perceived usefulness, perceived ease of use, systems quality, system complexity, and subjective norm. Factors of its Cronbach's  $\alpha$  value greater than 0.7 should be accepted and those of Cronbach's  $\alpha$  values less than 0.5 should be removed as in table 2.

Table 2. Reliability Test

Factors	Items	Cronbach's $\alpha$
Teaching Material	5	.8356
Internet connect quality	5	.8602
Learner e-learning self-Efficacy	5	.9114
e-learning content	8	.9322
Perceived ease of use	4	.9110
Perceived Usefulness	4	.8235
Attitude toward Using e-learning	3	.9257
Intention to use e-learning	3	.7886

### III. Data Analysis and Results

#### 1. Descriptive Analysis

The survey information includes: gender, age, and experience in using internet, e-learning experience.

Table 3. Characteristics of sample demographics

	Frequency	Percent
<b>Gender</b>		
Male	116	73.4
Female	42	26.6
Total	158	100.0
<b>Age</b>		
Under 30	66	41.8
From 30 to 39	64	40.5
From 40 to 49	19	12.0
Over 50	9	5.7
Total	158	100.0
<b>How many years have you been using the internet</b>		
Less than 1	0	0
1 to 3 years	0	0
3 to 5 years	28	17.7
More than 5	130	82.3
Total	158	100.0
<b>Have you ever approached e-learning in study</b>		
Never	11	7.0
First time	21	13.3
A few times	51	32.3
A lot	75	47.5
Total	158	100.0

2. T -test

T-test is used to analyze whether different segment of the samples will have different reaction on the variable. We used T-test to investigate the effect of gender on teaching materials, internet connect quality, learner e-learning self-efficacy, e-learning contents, perceived ease of use, perceived usefulness, attitude toward using e-learning, and intention to use e-learning.

Table 4. T-test results.

Variables	Gender	Mean	Std. Deviation	Sig. (2-tailed)
Teaching Material	Male	3.9017	.67785	.714
	Female	<b>3.9476</b>	.73791	.725
Internet Connect Quality	Male	<b>3.6190</b>	.72710	.885
	Female	3.6000	.73252	.886
Learner e-learning self-Efficacy	Male	<b>3.6466</b>	.73632	.830
	Female	<b>3.6762</b>	.83922	.840
e-learning Contents	Male	<b>3.2543</b>	.81376	.149
	Female	3.0298	.79362	.189
Perceived Ease of Use	Male	3.6099	.78801	.983
	Female	<b>3.6131</b>	.93411	.984
Perceived Usefulness	Male	<b>3.4375</b>	.89131	.161
	Female	3.2024	1.01998	.191
Attitude toward Using	Male	<b>3.5402</b>	.81134	.128
	Female	3.3175	.80295	.129
Intention to use e-learning	Male	3.6724	.84668	.532
	Female	<b>3.7698</b>	.91209	.548

**Teaching materials:** Female staffs are more efficiently than male staffs.  
**Internet connect quality:** Male staffs are more satisfied than female staffs.  
**Learner e-learning self-efficacy:** Female staffs are more satisfied than male staffs.  
**E-learning contents:** Male staffs are more satisfied than female staffs.  
**Perceived ease of use:** Female staffs are more satisfied than male staffs.  
**Perceived usefulness:** Male staffs are more satisfied than female staffs.  
**Attitude toward using e-learning:** Male staffs are more satisfied than female staffs.  
**Intention to use e-learning:** Female staffs are more satisfied than male staffs.

3. Correlation and Linear Regression Analysis

**Correlation Analysis:** Correlation is a leverage analysis that measures the strengths of association between two variables. As the value goes towards 0, the relationship between the two variables will be weaker. Usually, in statistics, we measure three types of correlation: Pearson correlation, Kendall rank correlation and Spearman correlation.

**Linear Regression Analysis:** Hypotheses in

this paper will be tested and analyzed by regression analysis to determine relationships between independent and dependent variables. The test is based on the R-square and adjusted R-square values to determine explanation for each factor, and p-value also is used to determine the significant level for each factor.

3.1 Correlation Analysis of Perceived Usefulness

Correlation between perceived usefulness and other factors is in table 5.

Table 5. Correlation between perceived usefulness and other factors.

Correlation		Teaching Material	Internet Connect Quality	Learner e-learning self-Efficacy	Perceived Ease of Use	Perceived Usefulness
Teaching Material	Pearson Correlation	1.000				
	Sig. (2-tailed)					
Internet Connect Quality	Pearson Correlation	.452(**)	1.000			
	Sig. (2-tailed)	.000				
Learner e-learning self-Efficacy	Pearson Correlation	.624(**)	.486(**)	1.000		
	Sig. (2-tailed)	.000	.000			
Perceived Ease of Use	Pearson Correlation	.576(**)	.547(**)	.665(**)	1.000	
	Sig. (2-tailed)	.000	.000	.000		
Perceived Usefulness	Pearson Correlation	.226(**)	.395(**)	.276(**)	.410(**)	1.000
	Sig. (2-tailed)	.004	.000	.000	.000	

\*\* Correlation is significant at the 0.01 level (2-tailed). N = 158.

3.2 Regression Analysis of Perceived Usefulness

Table 6. The statistical parameters of perceived usefulness.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Colinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.303	.427		3.049	.003		
Teaching Material	-.080	.129	-.060	-.620	.536	.554	1.805
Internet Connect Quality	.333	.113	.260	2.951	.004	.661	1.513
Learner e-learning self-Efficacy	-.032	.128	-.026	-.250	.803	.463	2.158
Perceived Ease of Use	.360	.118	.320	3.055	.003	.469	2.134

a Dependent Variable: Perceived Usefulness.

The correlation coefficients between factors are greater than 0.2. It shows that independent factors can be used to explain for perceived usefulness, with P-values < 0.004.

In the tables 5 and 6, the factors teaching material and learner e-learning self-efficacy are rejected with P-value greater than 0.05. The factors internet connect quality and perceived ease of use are supported with P-value < 0.05.

The variance inflation factor (VIF) < 3. It means that the collinear phenomenon will not happen.

### 3.3 Correlation Analysis of Perceived Ease of Use

Table 7. Correlation between perceived ease of use and other factors.

Correlation		Teaching Material	Internet Connect Quality	Learner e-learning self-Efficacy	e-learning Content	Perceived Ease of Use
Teaching Material	Pearson Correlation	1.000				
	Sig. (2-tailed)	.				
Internet Connect Quality	Pearson Correlation	.452(**)	1.000			
	Sig. (2-tailed)	.000	.			
Learner e-learning self-Efficacy	Pearson Correlation	.624(**)	.486(**)	1.000		
	Sig. (2-tailed)	.000	.000	.		
e-learning Content	Pearson Correlation	.368(**)	.397(**)	.468(**)	1.000	
	Sig. (2-tailed)	.000	.000	.000	.	
Perceived Ease of Use	Pearson Correlation	.576(**)	.547(**)	.665(**)	.598(**)	1.000
	Sig. (2-tailed)	.004	.000	.000	.000	.

\*\* Correlation is significant at the 0.01 level (2-tailed). N = 158.

### 3.4 Regression Analysis of Perceived Ease of Use

Table 8. The statistical parameters of perceived ease of use.

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Colinearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	-.204	.272		-.748	.456		
Teaching Material	.214	.080	.179	2.678	.008	.580	1.725
Internet Connect Quality	.216	.069	.190	3.108	.002	.698	1.433
Learner e-learning self-Efficacy	.342	.077	.316	4.459	.800	.518	1.930
e-learning Content	.296	.057	.309	5.215	.000	.740	1.351

a Dependent Variable: Perceived Ease of Use.

The correlation coefficients between factors are greater than 0.3. It shows that independent factors

can be used to explain for perceived ease of use, with P-values = 0.004.

In the tables 7 and 8, the factors teaching material, internet connect quality, learner e-learning self-efficacy and e-learning content are supported with P-value < 0.05.

The variance inflation factor (VIF) < 3. It means that the collinear phenomenon will not happen.

### 3.5 Correlation Analysis of Attitude toward Using E-learning

Table 9. Correlation between attitude toward using e-learning and other factors

Correlation		Perceived Ease of Use	Perceived Usefulness	Attitude toward Using e-learning
Perceived Ease of Use	Pearson Correlation	1.000		
	Sig. (2-tailed)	.		
Perceived Usefulness	Pearson Correlation	.410(**)	1.000	.407(**)
	Sig. (2-tailed)	.000	.	.000
Attitude toward Using e-learning	Pearson Correlation	.735(**)	.407(**)	1.000
	Sig. (2-tailed)	.000	.000	.

\*\* Correlation is significant at the 0.01 level (2-tailed). N = 158.

### 3.6 Regression Analysis of Attitude toward Using E-learning

The correlation coefficients between factors are greater than 0.4. It shows that independent factors can be used to explain for attitude toward using e-learning, with P-values = 0.000.

In the tables 9 and 10, the factors perceived ease of use, perceived usefulness are supported with P-value less than 0.05.

The variance inflation factor (VIF) < 3. It means that the collinear phenomenon will not happen.

Table 10. The statistical parameters of attitude toward using e-learning.

Model	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.	Colinearity Statistics	
	B	Std. Error				Tolerance	VIF
(Constant)	.725	.227		3.190	.002		
Perceived Ease of Use	.713	.061	.683	11.613	.000	.832	1.203
Perceived Usefulness	.118	.055	.127	2.158	.032	.832	1.203

a Dependent Variable: Attitude toward Using e-learning.

### 3.7 Correlation Analysis of Intention to Use E-learning

Table 11. Correlation between Intention to use e-learning and attitude toward using e-learning factor.

Correlation		Attitude toward Using e-learning	Intention to use e-learning
Attitude toward Using e-learning	Pearson Correlation	1.000	
	Sig. (2-tailed)	.	
Intention to use e-learning	Pearson Correlation	.603(**)	1.000
	Sig. (2-tailed)	.000	.

\*\* Correlation is significant at the 0.01 level (2-tailed). N = 158.

### 3.8 Regression Analysis of Intention to Use E-learning

Table 12. The statistical parameters of intention to use e-learning.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Colinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	1.380	.228		6.042	.000		
Attitude toward Using e-learning	.568	.060	.603	9.443	.000	1.000	1.000

a Dependent Variable: Intention to use e-learning.

The correlation coefficients between factors are greater than 0.6. It shows that independent factors can be used to explain for intention to use e-learning, with P-values = 0.000.

In the tables 11 and 12, the factor attitude toward using e-learning is supported with P-value less than 0.05.

The variance inflation factor (VIF) < 3. It means that the collinear phenomenon will not happen.

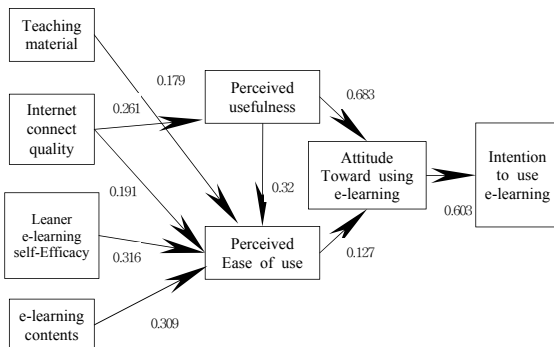


Fig. 3. Success research model.

### 4. Path Analysis

After analyzing relationship between factors, the resulting relationship is in Fig. 3. Compared with research model in Fig. 2 and hypotheses in table 1, two paths are omitted in the success research model with weak relationships (Hypothesis 1 and 3).

## IV. Conclusion

In this paper, success model of e-learning system is evaluated for VietHanIT College and important factors are identified, which have positive affect to success of research model. Data collection and analysis work are performed on real participants at VietHanIT College. They are education managers, lecturers, and staffs who take part in e-learning process.

The research results indicate that most of the staffs and lecturers of VietHanIT College have been aware of the benefits of e-learning system for VietHanIT College. These staffs and lecturers showed that they are ready to approach e-learning method for their training and teaching. Moreover, the result shows that factors in research model are relevant and positive impact significantly on the implementation of e-learning systems in VietHanIT College in accordance with the conditions and circumstances existing to improve the quality of higher education by applying e-learning system in Vietnam universities.

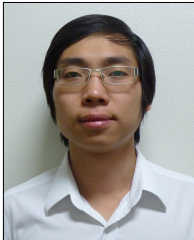
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