

DOES INNOVATION ATTITUDE AND TECHNOLOGY QUALITY EFFECT STUDENT SATISFACTION THROUGH PERCEIVED EASE OF USE AND PERCEIVED USEFULNESS? A STUDY OF UNIVERSITIES IN EMERGING COUNTRY'S PERSPECTIVE

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ABSTRACT

Education must be prioritized in the post Covid-19 recovery since it is one of the most effective anti-inequity strategies and promotes responsible citizenship and creativity. It's the thing that our world need attention more than ever. Although distance learning in the digital form has been present in higher education for a long time, it never had such a huge auditorium as recently due to the pandemics. The pandemic has revealed the prominence of technology and its impact on learning and teaching in education. Covid-19 has put an impulsion on educators to consider the instruments that will best supply their students and reflect pedagogical practice, digital technology has played an important role in this process. The implementation of information quality, systems quality and innovation attitude can be considered as important step in students's perceived use of ease and usefulness of higher education in Vietnam. As a result, the study seeks to identify the primary determinants influencing satisfaction in higher education in Vietnam. The combination of the Technology Acceptance Model (TAM) and Information systems success model were used as theoretical foundations for this investigation. Partial Least Squares SEM was used to evaluate the primary empirical data from 1218 respondents. Perceived ease of use and perceived usefulness have positive and significant effects on satisfaction, system quality affect positively on perceived usefulness but not perceived ease of use. As a result of his finding, the authors provided management implications for increasing student satisfaction in higher education in Vietnam.

Keywords: Covid-19, Digital Technology, Higher Education, Satisfaction.

INTRODUCTION

The COVID-19 epidemic has occurred led to maintaining and ensuring learning continuity. Digital transformation is confirmed as an inevitable trend in the context of the society in general, and education in specific. It has brought many opportunities to change in teaching, especially in models and methods via the application of new technology, which is not only appropriate in the actual situation but also creates an innovative driving force for education in the future.

In Vietnam, it has been statisticized that about 1,672,881 students studying at 172 public universities and 65 private universities across the country were forced to change from traditional learning methods to online learning to ensure the learning process by the end of 2020 (Ministry of Education and Training, 2020). Online teaching-learning is organized and implemented by universities via various applications (such as Microsoft Teams, Google

Meet, Zoom) combine of many teaching methods has brought an effect on the education sector.

E-Learning was and is a new learning trend so assessing teaching effectiveness through student satisfaction is one of the activities with high practical significance. It is true that using online learning applications, Information Quality, and System Quality are the main factors affecting students' satisfaction. When taking online courses, students expect to access supportive source documents and precision learning content. If students receive sufficient logical information, students can easily absorb and remember effectively. Therefore, students have innovative attitudes can easily adapt to any circumstances. The development of quality information resources and the modernity of online learning systems have affection on perceived ease of use. The result is that students are easily satisfied with the E-Learning method in the new context.

LITERATURE REVIEW

System quality: The concern for an entity's output quality is defined as system quality evaluated by accuracy and timeliness. Specifically, the relevance and accuracy of the information generated by an information system (DeLone & McLean, 2003). A successful online learning system should be evaluated based on the following characteristics, which include user-friendliness and effectiveness in providing useful feedback to learners. The system quality is such that learners can easily access each function of the lecture content at anytime and anywhere during the learning process (Nhi, 2021).

Information quality: A quality information system is evaluated by the output quality of the information source, so the quality aspects of the information content received from the system should be considered (DeLone & McLean, 2003). According to the IS Success Model proposed by (DeLone & McLean, 2003), using an information system helps users perceive information quality, system quality, and service quality. Furthermore, user satisfaction will have a positive impact on the system's perceived quality. The provision of desired information and services to users via a variety of information processing capabilities and processes, such as other IS or Internet/Web services, has resulted in many positive user perceptions. As a result, system quality can be regarded as a predictor of perceived usefulness and satisfaction (Kim & Lee, 2014).

Perceived ease of use: In the evolving online shopping landscape, directing consumers to "*easiness*" is an effective way to attract target customers, including both new and experienced shoppers. System quality and ease of use are two strongly related factors in information systems, with perceived ease of use seen as a result of system quality (Kumar & Lata, 2021). There is a direct and indirect relationship between system quality and ease of use (Wixom & Todd, 2005). The ease of use of information systems has a positive impact on customers. Previous research has found a significant positive relationship between system quality and ease of use in online marketplaces (Kumar & Lata, 2021).

Perceived ease of use reflects the amount of effort required from a potential user. Perceived ease of use was related to the ease with which students could use Web-based materials in this study. Perceived ease of use is significantly related to online acceptance and student satisfaction with online classes (Lee, 2010). Thus, the following hypotheses were proposed:

- H2: *System quality has a positive effect on perceived usefulness*
- H3: *Information quality has a positive effect on perceived ease of use*
- H4: *Information quality has a positive effect on perceived usefulness*

Perceived usefulness: According to (Davis, 1989), perceived usefulness is the degree to which a person believes that using a particular system will improve their job performance. As a result, Davis seems to emphasize that people's willingness to utilize an application is based on their idea that it will improve their job performance (Bansah & Agyei, 2022). The TAM model shows that the acceptability of an information system is determined by two main factors: perceived usefulness and perceived ease of use (Davis, 1989). Meanwhile, research into the adoption of information technology based on TAM has indicated that when users perceive the utility of an IS or Internet/Web system, service quality is significantly more crucial (Kim & Lee, 2014).

Kim et al. (2019) demonstrated information quality was statistically positively influenced by users' perceived usefulness, while system quality was statistically negatively influenced by users' perceived usefulness in connection with the Rural Development Administration, the Forest Service, and Korea Seed & Variety Service, Agricultural Resources, and Agricultural and Livestock Quarantine Headquarters. In the process of approaching online learning methods, the innovative attitude is directly related to the perception of flexibility in learning flexible learning. Students willing to try new methods, approaches, and risk-taking are more likely to discover technology and experience greater usefulness. The perception of the usefulness of online learning tools will affect the adoption of new learning methods, thereby leading to student satisfaction. From a practical perspective related to online learning, the easy access, easy to use, and easy to find information for students will stimulate and bring positive emotions, thereby encouraging learners to be proud. more interested in participating in the course (Nhi, 2021).

Innovation attitude: Attitude is an emotional state based on a set of beliefs about the subject of behavior (Davis, 1989). Using the background theory of the TAM technology acceptance model (Ibrahim et al., 2017) proved that learners' attitudes about computers or information technology are an important component of online learning. Researchers discovered a connection between inventive mindsets and computer use (as well as early adoption of IT advances). Researchers discovered a connection between inventive mindsets and computer use (as well as early adoption of IT advances). An inventive attitude is directly related to the perceived efficacy of flexible learning. According to the findings of this study, students who are ready to try new things and take chances are more likely to think positively about technology and perceive usefulness greater. In other words, when using Edmodo e-learning, students' attitudes prioritize usefulness. As a result, this study proposed a hypothesis:

H5: Innovation attitude positively affects perceived ease of use

Satisfaction: According to Kotler et al., satisfaction is the level of a person's sensory state resulting from comparing the results obtained from a product/service with that person's expectations. In the learning process, students have interesting experiences with communication tools, the higher the satisfaction and convenience, the higher the satisfaction. When satisfied, students will tend to accept online learning method and continue learning according to this method (Dung & Thù, 2020). Therefore, it is hypothesized that:

H6: Perceived usefulness has a positive effect on satisfaction

H7: Perceived ease of use has a positive effect on satisfaction

So that, there are two dependent variables and four independent variables which propose in this research model Figure 1.

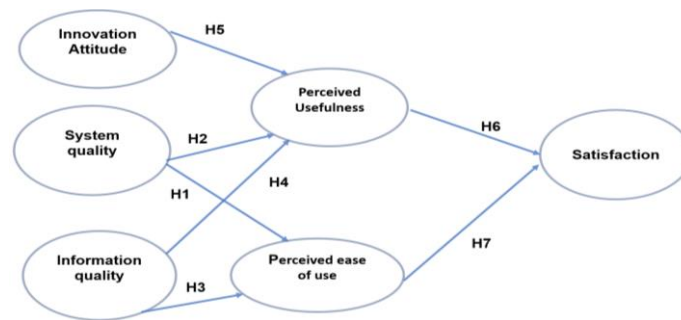


FIGURE 1
DEPENDENT AND INDEPENDENT VARIABLES

METHODS OF THE RESEARCH

The review applied a blended strategy for subjective and amount techniques and was led into two stages: the pilot study and the fundamental overview. The primary stage utilized subjective strategies, which was led through top to bottom meetings with five schooling specialists coming from Vietnam and gathering conversations of 16 studies to survey the substance legitimacy and fittingness of inquiries. Both inside and out meetings and gathering conversations were led through a Microsoft Team application. This stage pointed toward checking on regardless of whether the examination questions were proper prior to executing the principle overview. The subsequent stage, the quantitative technique, was attempted to survey the estimation model and design model. The review was executed by utilizing on the web overviews through email and Facebook.

To gauge the above builds, we utilized 19 scale things adjusted from past related examinations and 2 scale things. The things were estimated on 5-point Likert scales, going from "*emphatically clash*" to "*firmly concur*". Information was gathered through an internet based review. An aggregate of 1248 polls were submitted, however just 1218 satisfactory reactions were utilized for information investigation after cautious screening to kill bad quality overviews. We utilized a web-based deduced test size mini-computer for underlying condition models Soper to decide a productive and sufficient example size. Through analyzing the factual power levels (0.95), wanted likelihood (0.05), expected impact size (0.3), the quantity of idle builds (6), and the quantity of noticed (23 things), the outcomes show that 236 reactions are required as the least example size to identify the impact, 138 reactions are required as the most minimal example size for model construction. Subsequently, our example of 1218 is viewed as sufficient for underlying condition models and genuinely amazing to distinguish any massive impacts. Following (Anderson, 1988) we present a two-venture demonstrating approach: First, we inspected the estimation model to test dependability and legitimacy. Second, we analyzed the underlying model to examine connections among the hypothetical develops.

RESEARCH RESULTS

Of the total 1218 samples collected, 602 are public schools and 616 are private schools in Vietnam. The number of students participating in the survey in year 1 was 262 (21.5%), year 2 was 290 (23.9%), year 3 was 406 (33.3%) and year 4 was 260 (21.3) %. The majors that the students are studying are economics, design, engineering, information technology, law, English language, marketing and a few others. In addition, the software commonly used when learning online are Ms.Team, Google Meet, Zoom, BigBlueButton, Elearning, VooV and Blackboard, respectively.

Instead of concurrent testing, this PLS-SEM method examines structural measurements and models separately, and PLS-SEM has also been proved to be scientifically accurate (Ringle & Sarstedt, 2016). The verification procedure is divided into two steps (Henseler et al., 2016):

1. measurement model evaluation
2. structural model evaluation

The result showed that most of constructs meet reliability, convergent validity. In general, the show the existence of reliability, convergent validity and discriminant validity in our study. In addition, regarding discriminant validity, (Henseler et al. (2016) suggest use a value of 0.85 as a minimum and presents discriminant validity.

In summary, the measurement model results demonstrate that the constructs' reliability and validity are adequate, and we will continue to evaluate the structural model as proposed above. To test structural relationships, the conceptualized causal paths were estimated. displays the results. Six hypotheses were accepted, while one was rejected. The results support the proposed model. The specified relationship between perceived ease of use and satisfaction was shown to be valid (=0.383, P-value 0.01). This discovery is consistent with prior technological advancements and the trend toward flexible learning in education in Australia, China, assessing students' experiences of a Learning Management System in Gana, ubiquitous personal robot services in Korea, and so forth (Shao, 2020; Kim & Lee, 2014; Lee, 2010; Bansah & Agyei, 2022). They underline the importance of perceived usefulness as a motivator for student Table 1 to 3, Figure 2.

Constructs	Scale items	Factor loadings	Cronbach's Alpha	rho_A	CR	AVE
AT			0.746	0.751	0.855	0.662
Qualitative	AT1	I find online learning a new and highly effective learning method	0.814			
Drennan & Kennedy	AT3	I think that online learning has a positive impact on students' learning experience	0.807			
	AT4	I think the improvement of the new approach helps to see the usefulness better	0.82			
IQ			0.77	0.772	0.853	0.592
(Gallego et al., 2016)	IQ1	I use e-learning because is a new way to do learning	0.771			
	IQ2	I use e-learning because it is easy to retrieve information when I need at any time	0.749			
	IQ3	I use e-learning to access educational	0.755			
	IQ4	I find that the content of the information meets my learning needs	0.802			

PEU				0.626	0.624	0.801	0.573
Qualitative	PEU1	I can quickly submit my work on the system when I take the test	0.771				
(Mahande et al.)	PEU2	I can easily operate the functions on the e-learning system	0.708				
	PEU3	It is easy for me to use the learning system that does not require much IT knowledge	0.789				
PU				0.773	0.776	0.869	0.689
(Bansah & Agyei, 2022)	PU2	I think using the online learning system is an appropriate choice during the time of the Covid-19 epidemic	0.881				
	PU3	I think that online learning has a positive impact on students' learning experience	0.817				
	PU4	I think the improvement of the new approach helps to see the usefulness better	0.79				
SA				0.772	0.779	0.854	0.594
(Y. Kim & Lee, 2014)	SA1	I am generally satisfied with the online learning system	0.769				
	SA2	I think online learning has a positive impact on my learning outcomes	0.8				
	SA3	I am satisfied with the performance achieved when learning online	0.783				
(Dung & Thùy, 2020)	SA4	I feel satisfied with the quality of the school's online training	0.728				
SQ				0.745	0.745	0.855	0.662
(Mahande et al.)	SQ1	Page loading speed, transitions between websites, beautiful page design, attractive content on the page affect my satisfaction	0.818				
	SQ2	I find the online learning system highly secure	0.797				
Qualitative	SQ3	I find the good quality of the system helps to make online learning activities stable and continuous	0.826				

	AT	IQ	PEU	PU	SA	SQ
AT						
IQ	0.783					
PEU	0.881	0.866				

PU	0.805	0.824	0.822			
SA	0.852	0.811	0.855	0.761		
SQ	0.711	0.839	0.748	0.862	0.76	

Hypothesis	Estimate	T Value	P Values	Support
H1: SQ -> PEU	0.129	2.467	0.014	Rejected
H2: SQ -> PU	0.419	9.702	0	Accepted
H3: IQ -> PEU	0.309	5.453	0	Accepted
H4: IQ -> PU	0.371	8.307	0	Accepted
H5: AT -> PEU	0.354	7.27	0	Accepted
H6: PU -> SA	0.373	8.987	0	Accepted
H7: PEU -> SA	0.383	9.154	0	Accepted

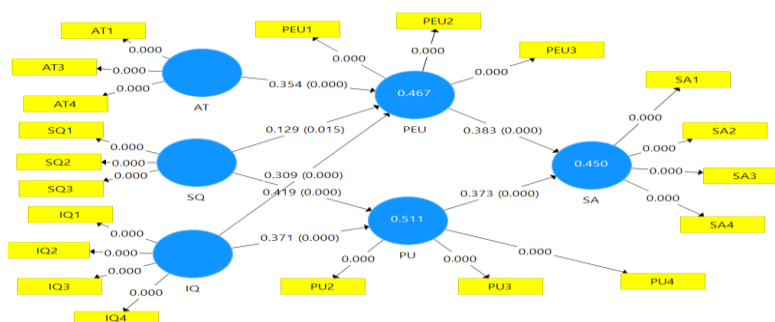


Figure 2
Testing PLS-SEM for factors affecting student’s satisfaction of higher education

According to Henseler et al (2016), the SRMR (standardized root mean square residual) index was used to verify the model's fit, and the research results with the SRMR coefficient value = 0.047 (0.082) suggest that the model fits. Other indicators, such as coefficient d ULS = 45.6 percent 95 percent and coefficient d G = 19.3 percent 95 percent, must also meet requirements satisfaction.

CONCLUSION

It is no doubt that the result of study argue that using the E-learning for teaching and learning has especially situated the satisfaction’s students in the Covid-19 padamic at the universities in Vietnam. The development of system and information quality has changed the face of the education system, marked by the increased use of electronic learning (e-learning) methods. This transformation of this learning system takes place more quickly with the emergence of the COVID-19 pandemic. One of the health protocols applied in the education world is to minimize the direct interaction between the parties involved in the teaching and learning process. Thus, the application of the e-learning method is a must, especially for higher education providers, namely universities. Meanwhile, it must be acknowledged that direct interaction in the form of face-to-face between learners and instructors is one of the determining factors for success in the learning system. That means universities need to prepare an e-learning system can facilitate optimal interaction. In addition to carefully considering the learner characteristics as the system users. This study tries to examine whether the e-learning system developed by a university is quite effective and fulfills the expectations of the users. The study emphasizes satisfaction when the use of system and

information quality and student's innovative attitude for efficient teaching and learning, also see the performance of perceived ease of use, perceived usefulness impact on satisfaction. At a 1 percent significance level, the results of data processing showed that 06 hypotheses are acceptable which are the same as the studies (Bansah & Agyei, 2022). And one is rejected that contradicts *the technology acceptance model (TAM), Information system (IS) and success model* that innovation attitude appeared as a strong determinant of perceived ease of use and should not be ignored by those attempting to design or implement successful systems.

MANAGERIAL IMPLICATIONS

Managerial implications improving the perceived ease of use (0.383). Students are satisfied with perceived ease of use rather than perceived usefulness. Thus, universities need documents and videos instructions on how to access, operate and how use the functions in the previous service system when students starts the course. In addition, higher education training should be interested in reducing complexity of the system to interact such as: arrange displayed information logically and easily, reduce the display of unnecessary images in system, simply assignment submission. The information displayed on Online learning systems should easy to access.

Managerial implications improving the perceived usefulness (0.373). The higher perceived usefulness will lead to higher student's satisfaction to attend E-learning. In other words, students will satisfied new learning management system more when they find new learning management system useful for them. The system and information quality play the role important in perceived usefulness which delivered to increase student's satisfaction. In brief, perceived usefulness will not only benefit in any place or time, but also flexibility and safer because of improvement of the innovation approach in the regular stream. The universities in Vietnam should coherently develop strategies to promote technology infrastructure quality.

The main limitation of this study has not fully evaluated both the factors which are concerned about quality dimensions such as information and communication quality and the perceived other of student effect on student satisfaction such as perceived convenience, perceived enjoyment, perceived cost...Finally, it is possible to generalize the research model to new approach for education in flexity situation, especially similarity situation (e.g. similarity in covid – 19 pandemic) or distance learning and online courses.

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