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Acceptance and Use of Video Conferencing for Teaching in Covid-19 Pandemic: An Empirical Study in Vietnam

Nguyen Thanh Khuong[1*], Nguyen Thi Hong Tham[2]

[1] Ho Chi Minh University of Law, Ho Chi Minh City, Vietnam
[2] Hoa Sen University, Ho Chi Minh City, Vietnam
*Correspondence: Nguyen Thanh Khuong, Ho Chi Minh University of Law, Vietnam. E-mail: ntkhuong@hcmulaw.edu.vn

Abstract

The Coronavirus disease outbreak of 2019 (COVID-19) has fundamentally altered the nature of learning at all levels, from university to primary school. In Vietnam, continual learning is ensured through the use of video conferencing applications. Video conferencing is a teaching tool that is used to facilitate communication and engagement between professors and students during an epidemic. The study employs a unified theory of acceptance and use of technology (UTAUT) to ascertain the elements that influenced the adoption of video conferencing for online training in Vietnam during the COVID-19 pandemic. A survey of 203 instructors who have used video conferencing for instruction during the COVID-19 epidemic was conducted and evaluated using a structural equation model (SEM). The results indicate that significant elements influencing the use of video conferencing for teaching during Covid-19 include effort expectancy, habit, hedonic motivation, and behavioral intention to use, which together account for 59 percent of video conferencing for teaching usage (R^2=0.59).

Keywords: video conferencing, UTAUT2, teacher video conferencing adoption

1. Introduction

COVID-19 will touch over 1.6 billion learners in 190 nations worldwide by 2020, according to United Nations data (Brief, 2020). In Vietnam, schools at all levels must be closed during the COVID-19 outbreak in accordance with Directive No. 16/CT-TTg on the implementation of social distancing. Dispatch No. 1247/BGDDT-GDCTHSSV on enhancing the safety of preschool children, students during their study over the Internet on March 14, 2020 to implement solutions to ensure the continuous learning of students. On March 23, 2020, at the college and university level, Dispatch No. 988/BGDDT-GDDH was issued regarding ensuring the quality of distant learning during the covid-19 outbreak. Next, on March 25, 2020, the Ministry of Education and Training issued directives, including Dispatch No. 1061/BGDDT-GDTrH on Internet and Television Instruction for General Education Institutions

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and Institutions During the Period of Student Leave from School Due to COVID-19 in the 2019-2020 school year.

Adapting teaching and learning practices in the midst of the COVID-19 pandemic is a significant problem for Vietnam's education sector. However, this is an excellent opportunity to further enhance online learning approaches. One extensively used technique is to educate using conference technologies in conjunction with learning management systems (LMS). In Vietnam, video conferencing tools such as Zoom, Google Meet, Microsoft Teams, and Skype are widely used. This also happened in Malaysia, Thailand and Iran (Hashim, 2006; Rahimi & Bigdeli, 2014). Throughout covid-19, this was a frequently employed method of instruction. According to Townsend, A.M., Demarie, S.M., & Hendrickson, A. R. (2001) in turns out that the student achieves good results when using the conference system (Townsend, Demarie, & Hendrickson, 2001). Another study by MacLaughlin, Supemaw & howard (2004) found that learning through conferences gives the same academic performance as traditional learning (MacLaughlin, Supemaw, & Howard, 2004). Additionally, numerous research has been conducted on students' intended behavior when it comes to video conferencing in order to ascertain the elements that influenced their use of this instrument during the Covid-19 pandemic ((Bui, Luong, Nguyen, Nguyen, & Ngo, 2020); (Ngo, Nguyen, & Tran, 2020); (Pham & Ho, 2020); (Fatani, 2020); (Hiroyuki, O., 2021); (Nguyen, T. N. M., & Nguyen, P. H., 2021); Nguyen, H. U. N., & Duong, L. N. T. (2021)). However, studies on the intended behavior and usage of video conferencing for teaching of instructors are of little notice at various school levels.

In this study, the author focuses on the Unified Theory of Acceptance and Use of Technology (UTAUT) ((Venkatesh, Morris, Davis, & Davis, 2003); (Venkatesh, Thong, & Xu, 2012)) to discover the elements that impact the intention and usage behavior of teachers in employing the video conferencing system to educate during the COVID-19 pandemic. The subjects and scope of inquiry are instructors at different levels of education who have utilized video conferencing technology to educate during the COVID-19 pandemic in Vietnam.

2. Literature review

2.1 Video Conferencing

Video conferences, according to the Oxford Dictionary, are "meetings in which persons from diverse locations communicate via voice and video." According to the United Nations Development Programme, free video conferencing tools such as Zoom, Google Meet, Microsoft Teams, and Skype were heavily used during the COVID-19 crisis. By utilizing video conferencing, businesses may increase their productivity, optimize and expedite decision-making, and reduce customer and employee travel costs associated with communication, exchange, and meeting procedures. Video conferencing in education enables continuous instruction throughout the COVID-19 cycle and lays the groundwork for the creation of online teaching activities in remote learning situations ((Fatani, 2020); (Sahi, Mishra, & Singh, 2020)).

2.2 Research model

Information systems research has extensively examined new technology adoption. Trend-conscious conduct was identified using the Psychosocial Perspective on Theory of Reasoned Action (TRA) ((Azjen, 1980); (Fishbein & Ajzen, 1977)). Ajzen created the Theory of Planned Behavior (TPB) by adding a component of perceived behavioral control to the TRA theory ((Ajzen, 1985);(Ajzen, 2002)). TPB urges the researcher to look at how consumers' social sensitivity affects their decision to utilize an online system (Crespo & del Bosque, 2008). In order to explain human behavior linked to information technology adoption, the Technology Acceptance Model (TAM) builds on the TRA's theoretical underpinnings ((Davis, 1989); (Davis, 1993)). The IDT detailed how people assimilate technical advancements (Rogers, 1995). Venkatesh et al. created the UTAUT to explain information system users' intentions and behavior. A combination of the TPB and TAM models, IDT, the Motivation Model (MM) (Davis, Bagozzi, & Warshaw, 1992), the Model of Personal Computer Use (MPCU) (Thompson, Higgins, & Howell, 1991), and Social Cognitive Theory were used to construct UTAUT (SCT) (Compeau & Higgins, 1995). Performance expectancy, effort expectancy, social influence, and facilitating condition were used to produce UTAUT. Venkatesh et al. later introduced UTAUT2, which adds hedonic motivation, price value, and habit to the original UTAUT concepts. Then UTAUT2 includes demographics like age, gender, and experience.

2.3 Hypotheses

Performance Expectancy (PE) is described as an individual's belief that by implementing a specific system, they will be able to achieve competitive advantages at work (Venkatesh et al., 2003). Perceived usefulness in TAM, extrinsic motivation in MM, job fit in MPCU, and result expectation in SCT are the five constructs that make up various models of performance expectancy. The teacher believed that video conferencing would boost their performance and that individual students would be happier with it. As a result, the subsequent hypothesis has been proposed

Hypothesis 1: PE has a beneficial effect on the intention to use video conferencing (VCI).

Effort Expectancy (EE) is described as the ease with which information systems can be combined (Venkatesh et al., 2003). According to Amoaka (2004), the effort is anticipated to determine the end-intention users to use the information system (Amoako-Gyampah & Salam, 2004). Teachers' decisions on whether or not to use video conferencing are influenced by the system's expected effort. The following is the H2 hypothesis:

Hypothesis 2: EE has a beneficial effect on a person's intention to engage in video conferencing (VCI).

The degree to which an individual is aware that other influential individuals believe the new method is better for work is referred to as social influence (SI) (Venkatesh et al., 2003). The subject norm in TAM, social element in MPCU, and image in IDT are all examples of

social influence as a direct predictor of behavioral intention. Teachers would be influenced by the social aspects of video conferencing in deciding whether or not to use it. As a result, it proposes:

Hypothesis 3: SI has a beneficial effect on the intention to use video conferencing (VCI).

The facilitating condition (FC) is that the degree to which an individual believes that a company and technical infrastructure exist to create the system easier to use (Venkatesh et al., 2003). Perceived behavioral control, facilitating condition, and compatibility are the principles indicated by three separate conceptions in TAM, MPCU, and IDT. The technological features of a video conferencing facility would have an impact on the teacher's decision to use it or not. As a result, the following proposal was made:

Hypothesis 4: FC has a beneficial effect on the intention to use video conferencing (VCI).

Hedonic Motivation (HM) is described as joy or enjoyment experienced as a result of utilizing the system, as well as a significant contribution to the desire to use the new system (Brown & Venkatesh, 2005). Research on information systems has found that hedonic motivation is directly connected to the adoption and use of technology. The teacher's decision to employ video conferencing would be influenced by its hedonic motive. The H5 theory is as follows:

Hypothesis 5: HM has a beneficial effect on the intention to use video conferencing (VCI).

Habit (HB) is described as the degree to which humans tend to perform behaviors automatically as a result of learning, and habit is sometimes confused with automaticity (Limayem, Hirt, & Cheung, 2007). Venkatesh (2012) claims that HB has a direct or indirect influence on behavioral intention (Venkatesh et al., 2012). The HB of a video conferencing system will influence the teacher's decision to use the system in the future. As a result, we have hypothesis H6 and H7:

Hypothesis 6: HB has a beneficial effect on the intention to use video conferencing (VCI).

Hypothesis 7: HB has a beneficial effect on the use of video conferencing (VCU).

Price Value (PV) is defined as a consumer cognitive trade-off between the perceived benefits of applications and the financial cost of using them. (Dodds, Monroe, & Grewal, 1991). Venkatesh (2012) defines PV as users' perceptions of trade-offs between benefits and costs (Venkatesh et al., 2012). The teacher's decision to employ video conferencing would be influenced by the PV. As a result, we've got the H8 hypothesis:

Hypothesis 8: PV has a beneficial effect on the intention to use video conferencing (VCI).

Video conferencing intention (VCI) is defined as an individual's intention to perform a

specific action or as a subjective probability of completing the behavior, as well as the cause of a specific act of usage (Mun, Jackson, Park, & Probst, 2006). The goal of video conferencing is to get teachers to use it. As a result, we have the hypothesis H9:

Hypothesis 9: VCI has a beneficial effect on the use of video conferencing (VCU).

The analysis included demographic data (DE), such as age, gender, school level, and information technology communication (ICT) experience, as suggested by UTAUT2. As a result, it speculates on the following:

Hypothesis 10: DE has an effect on both independent and dependent elements.

3. Methods

3.1 Research method

The research was conducted in two stages: (1) preliminary qualitative research and (2) formal quantitative research. To create a draft scale, the author used the theory of unifying and accepting technology use (UTAUT2) and the actual situation of using conferences to teach during the COVID-19 outbreak in Vietnam. Following that, the author discussed the draft scale with teachers who used the video conferencing system to teach during the COVID-19 epidemic in order to calibrate it and provide a preliminary experimental scale for research. The scale from the preliminary study was used in the formal study after it was corrected. The observed variables in the official study were quantified using a 5-point Likert scale (at the lowest level 1 is strongly disagree and the highest level is 5 strongly agree). The survey will be distributed via social media platforms, forums, and teacher communities in Vietnam. A total of 215 data samples were collected, with 203 samples (12 invalid samples) of 29 observed variables being usable. SPSS software (Cronbach's Alpha and EFA) and AMOS were used to clean and analyze the collected data (CFA and SEM). The formal study's analysis included exploratory factor analysis (EFA); reliability analysis (Cronbach's Alpha); confirmatory factor analysis (CFA); and analysis of the structural equation model (SEM) to test the model and the research model's hypotheses.

3.2 Data collection and Descriptive statistics

The descriptive data are used to determine indicators for teachers who used video conferencing to train students during the Covid-19 epidemic. Video conferencing app: 54% of respondents utilized ZOOM, with 32% using MS Team, the rest were Google Meet and other applications, 11% and 3% respectively. Gender distribution is unequal, with roughly 70% female and 30% male. Age: respondents aged 31-40 and 41-50 account for 50.2 percent and 29.6 percent, respectively; the remaining respondents are aged 22-30 and above 50. ICT Experience: Nearly 85% of respondents reported having more than ten years of computer experience; the remainder reported having fewer than five years. School level: more over half of the respondents are now in high school, and around one-quarter of them are currently in secondary school. Another one-quarter of the respondents are currently at university, and the remaining nine percent are in primary school.

4. Results

4.1 Exploratory Factor Analysis (EFA)

PV1 and PV3 were excluded from the first exploratory factor analysis (EFA) because their factor loadings were less than 0.50. After eliminating PV1 and PV3, the price value (PV) component was left with just one variable to evaluate. As a result, the PV component of the exploratory factor analysis was omitted (EFA). The second EFA then extracted eight items from the 26 indicators. As predicted by the theoretical model, the variables coalesce into eight groupings factors in the rotational component matrix, including effort expectancy (EE), facilitating condition (FC), hedonic motivation (HM), habit (HB), video conferencing intention (VCI), and video conferencing usage (VCU). According to Table 1, the EFA factor loadings of all indicators vary between 0.641 and 0.904.

Table 1. Structure of Components and Scale for Video Conferencing Usage

	Observed variables		Factor Loading		Cronbach Alpha	Average Variance Extracted
			EFA	CFA	CR	AVE
Performance Expectancy (PE)					0.763	0.531
1	I am always available to use the video conferencing system to teach online.	PE1	0.70	0.82		
2	I'm really interested in learning how to use and operate the video conference system.	PE2	0.64	0.80		
3	I'll be using a video conferencing system that fully combines online teaching support tools.	PE3	0.84	0.79		
Effort Expectancy (EE)					0.892	0.679
4	I find it simple to teach online using the video conferencing method.	EE1	0.90	0.87		
5	I know how to use the video conferencing technology.	EE2	0.78	0.84		
6	The video conferencing system gives me complete instructions to help me with the teaching process.	EE3	0.71	0.83		

	Observed variables		Factor Loading		Cronbach Alpha	Average Variance Extracted
			EFA	CFA	CR	AVE
7	It's simple to learn how to use the video conferencing technology.	EE4	0.87	0.75		
Social Influence (SI)					0.827	0.627
8	My colleagues believe that using the video conferencing system for online education will be more effective.	SI1	0.75	0.88		
9	Other schools also use the video conferencing system for online education.	SI2	0.89	0.76		
10	My supervisor believes that I should use video conferencing to teach online to boost engagement.	SI3	0.73	0.73		
Hedonic Motivation (HM)					0.778	0.544
11	I will have access to all necessary information for online training via the video conferencing technology.	HM1	0.67	0.85		
12	Utilizing a video conferencing solution enables me to expand my capacity for online interaction with students.	HM2	0.70	0.83		
13	When I'm teaching online via video conferencing, it's simple for me to enlist the assistance of another instructor.	HM3	0.76	0.83		
Habit (HB)					0.847	0.650
14	I have made it a practice to use the video conferencing system for online instruction.	HB1	0.77	0.83		
15	I am confident in using the video conferencing system for online education.	HB2	0.79	0.85		
16	I can't quit using video conferencing to teach online.	HB3	0.77	0.77		

	Observed variables		Factor Loading		Cronbach Alpha	Average Variance Extracted
			EFA	CFA	CR	AVE
Facilitating Condition (FC)					0.841	0.571
17	Have ideal settings for using the video conferencing equipment to teach online	FC1	0.69	0.79		
18	Provide good settings for obtaining video tutorials for learning and for using the video conferencing system for online teaching.	FC2	0.81	0.73		
19	Find instructions on how to use the video conferencing technology to teach online.	FC3	0.72	0.76		
20	I quickly learned how to use the video conferencing equipment to support my teaching.	FC4	0.78	0.75		
Price Value (PV)						
21	Online teaching with video conferencing provides more information and comfort than it costs.	PV1				
22	Video conferencing increases engagement and ensures teaching.	PV2	Eliminated			
23	Using video conferencing to teach online will save you time and effort.	PV3				
Video Conferencing Intention (VCI)					0.876	0.703
24	I intend to use the video conferencing system for online instruction.	VCI1	0.72	0.82		
25	I always consider employing the video conferencing technology.	VCI2	0.88	0.75		
26	I intend to employ video conferencing for online instruction more regularly.	VCI3	0.82	0.60		
Video Conferencing Usage (VCU)					0.853	0.668

	Observed variables		Factor Loading		Cronbach Alpha	Average Variance Extracted
			EFA	CFA	CR	AVE
27	I always teach online using the video conferencing method.	VCU1	0.73	0.80		
28	I use the video conferencing equipment to improve my relationships with students.	VCU2	0.77	0.70		
29	I had numerous unique experiences using the video conferencing system to teach online.	VCU3	0.90	0.71		

4.2 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) validates the model's fit to the data. According to Table 2, the Chi-square (χ^2)/DF value is 1.197; the GFI value is 0.895; the TLI value is 0.975; the CFI value is 0.979; and the RMSEA value is 0.031. According to Table 1, all observed variables had high standardized CFA factor loadings, ranging between 0.604 and 0.883. According to Fornell & Larcker (1981), an average variance extracted (AVE) of 0.53 to 0.70 (more than 0.50) indicates that the measures have a high degree of convergent validity (Fornell & Larcker, 1981). Additionally, because all AVEs are greater than the associated squared correlation coefficients, the measures acquire discriminant validity (r^2). Additionally, the Cronbach alpha values for all variables in official measurements are adequate, indicating that they are valid measures (>0.70).

Table 2. CFA Indicator

Indicator	Level of acceptance	Results	Reference
RMSEA	RMSEA <0.08	0.031	(Hair, 2009)
GFI	If greater than or equal to 0.9, the model fits satisfactorily. Between 0.8 and 0.9 is an acceptable level of model fit.	0.895	(Seyal, Rahman, & Rahim, 2002); (Hu & Bentler, 1999)
CFI	If greater than or equal to 0.9, the model fits satisfactorily.	0.979	(Hair, 2009)

TLI	If greater than or equal to 0.9, the model fits satisfactorily.	0.975	(Hair, 2009)
CMIN/Df (χ^2/dF)	1.0 < Cmin/df <3.0	1.197	(Hair, 2009)

4.3 Structural Equation Model (SEM) Analysis

The maximum likelihood (ML) estimation of the structural equation model (SEM) yields theoretical scale indices of χ^2/dF=1.786; GFI=0.825; TLI=0.900; CFI=0.910; and RMSEA=0.062. In this case, the model is a good match for the market data. Table 3 shows the SEM in the estimates, which reveal that EE, HM, and HB have positive effects on VCI with γ=0.157 (p=0.003), 0.222 (p=0.003), and 0.294 (p=0,001), respectively, supporting H2, H5, and H6. Neither the path from PE, SI, and FC to VCI, nor the line from HB to VCU are, however, dismissed. And the findings back up H9 by demonstrating that VCI has an effect on VCU with γ=0.592 (p=0.001).

Table 3. Analysis results of relationship

Hypothesis	Relationships			Estimate	SE	CR	P - value	result
H1	VCI	←	PE	0.056	0.079	0.706	0.480	Rejected
H2	VCI	←	EE	0.157	0.054	2.943	0.003	Supported
H3	VCI	←	SI	0.071	0.056	1.263	0.206	Rejected
H4	VCI	←	FC	0.122	0.070	1.735	0.083	Rejected
H5	VCI	←	HM	0.222	0.074	2.998	0.003	Supported
H6	VCI	←	HB	0.294	0.068	4.326	***	Supported
H7	VCU	←	HB	0.110	0.074	1.486	0.137	Rejected
H9	VCU	←	VCI	0.592	0.094	6.275	***	Supported

The ANOVA test is used to examine if any variations in the connection between PE, EE, SI, FC, PV, HM, VCI, and VCU are due to demographic factors such as age, gender, school level or ICT experience. The data suggest that relationships between independent and dependent variables are unaffected by age, gender, school level or ICT experience and are statistically significant at p=0.05. As a result, H10 is deemed invalid. This research generally supports four out of every ten hypotheses (see Figure 1).

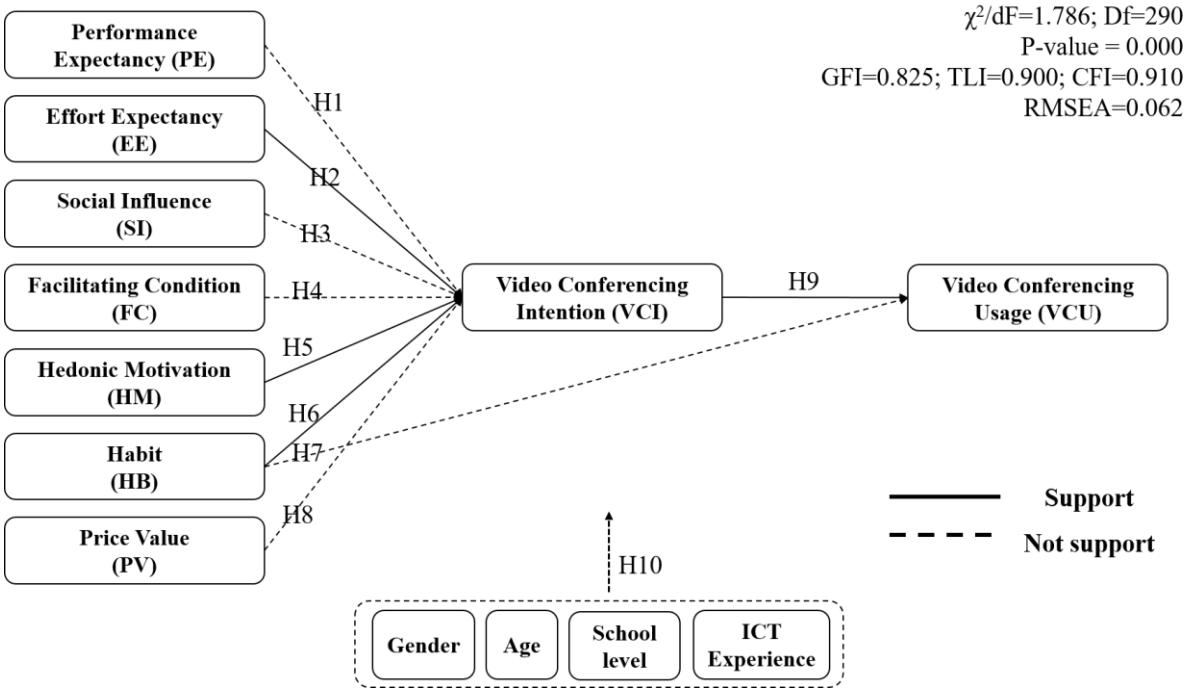

Figure 1. The acceptance and use of video conferencing model

4.4. Discussions

In summary, four of the study's ten hypotheses are accepted, and structural equation model (SEM) analysis indicates that independent and intermediate components may account for approximately 59% (R^2=0.59) of the variation. According to the study, 59% of video conferencing usage behavior in teaching during the COVID-19 outbreak was driven by variables that directly affect video conferencing usage. In terms of EE, HM, and HB, factors are those that have a direct effect on the teacher's intention to use the video conferencing system, as well as on the teacher's action.

This study examined the factors affecting the acceptance and use of video conferencing for teaching in Vietnam during the Covid-19 pandemic, using the unified theory of acceptance and use of technology (UTAUT2) framework. Our study discovered that effort expectancy had a significant effect on teachers' behavioral intention to use video conferencing (EE). Additional studies (Tarhini, Al-Busaidi, Mohammed, & Maqableh, 2017) corroborate this finding. A study found that EE had a big effect on the employment of animation and storytelling during this regard (Suki & Suki, 2017). As a result, the teaching-learning process appears to be simplified during Covid-19 pandemic when using video conferencing. Hedonic motivation (HM) had a major positive effect on the behavioral intention of teachers to use video conferencing. HM was connected to a mobile learning adoption intention (Moorthy, Yee, T'ing, & Kumaran, 2019). When it involves video conferencing, enjoyable learning experiences are critical. A user-friendly environment and electronic content significantly contribute to the creation of pleasurable learning experiences (El-Masri & Tarhini, 2017). As a result, educational designers should keep these characteristics in mind. The findings of this study indicated that habit (HB)

had a positive effect on teachers' intentions to use video conferencing systems. in keeping with Venkatesh et al. (2012), routine use of a technology incorporates a significant effect on its adoption (Venkatesh et al., 2012). In general, our study found that teachers' behavioral intentions to use video conferencing had a big effect on their actual video conferencing use. Our findings corroborated prior research ((Hoque & Sorwar, 2017); (Suki & Suki, 2017); (Ravangard, Kazemi, Abbasali, Sharifian, & Monem, 2017)). The intention to use video conferencing was predictive of actual use. the particular use of video conferencing was also contingent teachers' behavioral intent to try and do so. In summary, our findings indicate that teachers are willing to use video conferencing to boost the standard of their teaching experiences. We believe that teachers come from a range of economic, social, and cultural backgrounds in developed and developing countries. These various circumstances may have a major impact on teachers' intentions to adopt a brand new instructional system. Video conferencing may be a new approach within the Covid-19 pandemic and better education in Vietnam as a developing country. As a result, additional research on video conferencing system adoption is strongly recommended.

5. Conclusion

The purpose of our work - to examine the instructor's acceptance and use of Video Conferencing technology using the UTAUT2 methodology - has been accomplished. The findings indicate that variable measures ensure reliability. Both EFA and CFA generate high factor loadings for the variables, and their measures exhibit discriminant validity. Additionally, the SEM analysis demonstrates that factors such as effort expectancy, hedonic motivation, and habit all influence and affect video conferencing adoption; conversely, video conferencing adoption has an effect on video conferencing usage.

According to the study's conclusions, teachers must make substantial efforts to continue continuous education throughout the COVID-19 epidemic by utilizing video conferencing technology. Obtaining support from communities and professionals in the same field has also resulted in the development of various values beneficial to instructors, which is one of the major reasons for utilizing video conferencing for teaching. By utilizing video conferencing to educate during the COVID-19 epidemic, instructors were able to develop favorable behaviors that enabled them to use information technology to enhance education. The intention to use conference sessions is most strongly influenced by habitual variables. Thus, teachers should use video conferencing on a regular and consistent basis to build habits when adopting remote learning.

For online training, the study's findings shed light on the most widely used methods for ensuring continuous learning between teachers and learners who may interact and converse in real time. As a result, the use of conference meeting apps is required for distance training programs and during the covid-19 epidemic. However, to ensure efficient usage of this application, teachers require training and direction on how to use it effectively during the teaching process.

Additionally, teachers play a critical role in the session's effectiveness and the happiness of learners while using conference meeting programs for teaching ((Selim, 2007); (Shee & Wang, 2008); (Alqahtani & Rajkhan, 2020)). The teacher will operate not just as a teacher, but also as a transmitter of knowledge, assisting learners in their learning process through the use of conference meeting software.

For managers and educational policymakers, research indicates that using video conferencing technology for distance training and online teaching is a viable option. Developing online and distance education programs requires the use of video conferencing tools to facilitate communication and instruction between teachers and students. As a result, managers must develop an appropriate strategy for utilizing, exploiting, and integrating conference applications into learning content management systems appropriate for each specific level of study in order to ensure the quality of teaching and learning outcomes for learners. Additionally, as new technologies are implemented in education, managers must develop training and teacher development plans in order to develop a core human resource for the future development of online training and distance learning.

In a follow-up study, the authors will explore the combined effects of the elements as well as expand the scope and subject of the research, modify the scales, add more variables to the research model, use random sampling, and make recommendations that will help educators, e-learners, educational organizations, and service providers implement video conferencing and e-learning strategies.

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Biodata

Nguyen Thanh Khuong *is a lecturer of Information Technology at Ho Chi Minh University of Law, Vietnam. His academic interest areas are open and distance education, online learning, e-learning, information communication technology in education, information system in business and e-commerce.*

Nguyen Thi Hong Tham *is a teacher at Nguyen Thai Binh secondary school and is currently studying for a Master of Arts in Linguistics at Hoa Sen University, Vietnam. She has over 10 years of experience in teaching English for students. Her academic interest areas are about education and methodology in learning a foreign language.*