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Factors Affecting Postgraduate Student's Intention in Using an E-examination System During the Covid-19 Pandemic: Application of UTAUT Model

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B.D.T.M. Kamalasena*
Faculty of Management and Finance, University of Ruhuna
tharindi@mgt.ruh.ac.lk

A.B. Sirisena
Faculty of Management and Finance, University of Ruhuna
amila@badm.ruh.ac.lk

Abstract

The emergence of COVID-19 has compelled higher educational institutions across the globe to embrace remote learning as a medium of teaching. Furthermore, as a method of evaluation e-exam systems are widely used at present. Considering the e-exam systems, prior research has mainly focused on technological advancements and how to overcome technological barriers in using e-exam systems. Behavioral aspects of students have been taken into consideration in this study, which focuses on identifying the factors affecting postgraduate student's intention in using the e-examination system during the Covid-19 pandemic. To accomplish this objective modified UTAUT model was used and the required data was collected from 167 postgraduates in Sri Lankan state universities chosen through the purposive sampling method. A self-administered questionnaire was distributed among the sample and the analysis was done using Smart PLS-SEM and SPSS software. The findings revealed that except for social influence and facilitating conditions, all the other variables have a significant impact on behavioral intention to use e-exam systems, and considering the mediating effect of performance expectancy and effort expectancy, the relationships between computer anxiety and behavioral intention and fear of infectious diseases and behavioral intention are mediated by the performance expectancy and effort expectancy. In terms of theoretical implications, this study fills the existing gap in the literature about the student's perspective on using an e-exam system, and from the managerial point of view, the insights of this enhancing the performance, habit, and reducing the effort of using an e-exam system the university students can be adapted to use e-exam systems even in future.

Keywords: Behavioral Intention, E-examination system, UTAUT model, Post Graduate Students

* Corresponding Author - tharindi@mgt.ruh.ac.lk

Introduction

The COVID-19 virus first appeared in Wuhan, China, in the year 2019, and was quickly declared a pandemic due to the extremely high infectious rate at which it spread throughout the world. According to the World Health Organization, (2020) report, the presence of Coronavirus had been confirmed in approximately 130 countries and territories as of mid-March 2020. COVID-19, according to Ahorsu, et al., (2020), is a highly infectious disease with a high mortality rate, which naturally increased people's anxiety because the concern about the disease was based on contact with people who might be infected with the disease Lin, (2020). In order to prevent the spread of the Coronavirus, most countries had implemented stringent measures such as school vacations, working from home, quarantine for areas with a high number of cases, and, most importantly, lockdown (Atalan, 2020). Individuals all over the world were forced to stay at home in order to prevent the spread of the Coronavirus, putting their livelihoods at risk. Students all over the world, in particular, had to face plenty of difficulties as a result of the closure of educational institutions.

The Covid-19 pandemic affected the teaching and learning of more than 64.4 percent of the world's student population, according to the United Nations Educational, Scientific, and Cultural Organization (UNESCO), (2020). Since March 2021, Sri Lanka too imposed strict regulations, which included the immediate closure of schools and higher educational institutions. According to a recent survey conducted by the International Association of Universities (IAU) of higher education institutions worldwide (N = 424, 109 countries), more than 90% of surveyed institutions had either discontinued classroom instruction in favor of remote instruction or were in the process of developing solutions to continue distance education and learning (Marinoni, Land, & Jensen, 2020).

As a result of the shift to online learning, educational institutions faced significant challenges in terms of organizing examinations and ensuring that students have the opportunity to improve in their studies (OECD, 2020). E-exams (electronic examinations) were introduced as an effective mode of assessment, with a particular emphasis on providing immediate exam feedback; however, with the increase in the number of students, the academic staff members had to face challenges in using e-exam systems. E-exams are currently considered to be a critical component of distance education (Wibowo, Grandhi, Chugh, & Sawir, 2016).

A health crisis may hasten the development and adoption of digital and online technologies, which could pave the way for exciting new possibilities in student assessment (OECD, 2020). However, even with the most advanced technological infrastructure, there is a chance that technical failures will occur during electronic exams (Hillier, Kumar, & Wijenayake, 2020). Despite the fact that many educational institutions had adopted e-exams as a mode of assessment, these had all been based on in-campus E-exams (Dermo, 2009). E-exams held in educational institutes are treated similarly to traditional exams in terms of the suitability of the exam environment, technical support, and exam invigilation (OECD, 2020). However, taking remote E-exams means that students will be required to complete the exam at their own convenience, which presents a number of additional challenges. Despite the fact that these difficulties were described during routine E-exams, it is possible that they would be exaggerated when using a remote application (OECD, 2020). One example is the possibility of technical difficulties that could adversely impact the validity of an examination, as well as the possibility of an increase

in dishonest behavior among students (Chirumamilla, Sindre, & Nguyen-Duc, 2020). The majority of in-campus electronic exams were created to serve as a mode of assessment for theoretical materials. Remote E-exams, on the other hand, present additional challenges, such as the difficulty in assessing practical knowledge and skills, all of which can interfere with the achievement of the learning objective itself (Elsalem, Al-Azzam, Jum'ah, & Obeidat , 2020).

The use of an electronic exam system in the educational environment was inevitable because it was one of the tools available to measure students' learning outcomes during the Covid-19 outbreak (Farzin & Dahlan, 2018). Many studies (Rahim, 2020; Zainuddin, Shujahat, Haruna, & Chu, 2020) concentrated on the technical difficulties of development rather than taking into consideration the behavioral aspects of students, especially in the Covid-19 pandemic situation. The implementation of an e-examination system is expected to have implications for university lecturers, IT personnel, and administrators. However, it is noteworthy that the effectiveness of this process relies solely on the students. Therefore, gaining the student's positive attention by addressing the concerns and issues that students face can yield significant advantages for decision-making managers, as well as IT personnel and developers (Farzin & Dahlan, 2016). Regarding Sri Lanka, very few research articles have been published in the field of e-examination systems, since universities and other higher educational institutes had not been using these systems prior to the pandemic outbreak. Considering the theoretical gap, contextual gap, and the significance to the practitioners, this study focused on identifying the factors affecting postgraduate student's intention in using the e-examination system during the Covid-19 pandemic.

Review of Literature and Hypothesis Development

E-exam

The e-exam concept is well-known for its timed, supervised, and summative assessment, which is accomplished through the use of a student's personal computer running a specialized and standardized operating system (Jadi, 2021). Further, Jadi (2021) outlined that this approach is quite common in some universities where the Bring Your Own Device (BYOD) policy is followed. In many higher educational institutions, e-exam systems are quickly gaining acceptance because examination is a standard and long-accepted process for evaluating the levels of knowledge acquired by students and e-exam systems offer great potential to enhance the process (Adebayo & Abdulhamid, 2014). As Ahmed, et al., (2021) outlined, an e-exam consists of multiple choices, true or false, matching, arrangements, fill-in-the-blanks, essays, and other types of questions. It is created by specialized software to detect an individual's performance in all relevant areas. There is a distinction to be made between an e-exam and a computer-based assessment (CBA), which relies on the use of specialized software without being connected to any network (Maisie , 2006). Network-based assessment (NBA), on the other hand, is dependent on the use of internet techniques, such as a remote exam network, while also taking into consideration the range of coverage available (Ahmed, et al., 2021).

The Unified Theory of Acceptance and Use of Technology (UTAUT Model)

Venkatesh, Morris, Davis, & Davis, (2003) were the first to propose and test the UTAUT model. Theories like the Technology Acceptance Model (TAM), the Theory of Reasoned Action (TRA), the Diffusion of Innovations (DOI) Theory, as well as the Theory of Planned Behavior (TPB) were synthesized to develop the theory (Ibrahim, Ba'aba, Ismail, & Dawud, 2021). According to this theory, it is important to consider how user behavioral intentions to use a particular technology or system are influenced by a variety of factors and moderators. The four main factors proposed by the original UTAUT are performance expectancy, effort expectancy, social influence, and facilitating conditions, with age, gender, and experience of users, as well as voluntariness of use, specified as likely moderators of the influence of the main factors on behavioral intention (Venkatesh, Morris, Davis, & Davis, 2003). With the introduction of some new factors, such as habit, price value, hedonic motivation, learning and teaching methods, cognitive individual differences, and trust, the theory has seen significant advancements over time (Venkatesh, Morris, Davis, & Davis, 2003; Decman, 2015; Sumak & Sorgo, 2016).

Modified UTAUT Model Adapted to the Study

The Technology Acceptance Model (TAM) developed by Davis, (1989) has been the foundation for most research on technology acceptance. The extent to which a person willingly and continuously uses a certain technology is defined as technology adoption. According to findings from the majority of studies on the acceptance and use of new technology, initial intentions to adopt new technology are preceded by the actual adoption of that technology (Chu & Chen, 2016).

Thus, in order to identify the important predicting variables for students' behavioral intention to voluntarily utilize e-exam systems in Sri Lankan institutions during the Covid-19 epidemic, this study employed as its research model a modified UTAUT that includes performance expectancy and effort expectancy as mediating variables which mediate the relationships between fear of infectious diseases and behavioral intention and computer anxiety and behavioral intention. Moreover, social influence, facilitating conditions, and habit are used as student predictor variables. Computer anxiety and habit were not included in the original UTAUT conducted by Venkatesh, Morris, Davis, & Davis, (2003), the lack of which is often cited as a shortcoming of the initial UTAUT model (Farzin & Dahlan, 2016). As a result, the variable computer anxiety was included in the UTAUT version that was used for this research. Accordingly, a new conceptual model has been developed by the researcher taking the modified UTAUT model, computer anxiety, and fear of infectious diseases into account.

Performance Expectancy

Performance Expectancy is defined as "the degree to which a person thinks that utilizing the system would assist him/her in achieving improvements in work performance" (El-Masri & Tarhini, 2017). Perceived usefulness in the TAM and relative advantage in the Diffusion of Innovations model are both comparable to performance expectancy (Venkatesh, Morris, Davis, & Davis, 2003). Performance expectancy was seen to be a direct motivator for the behavioral intention in the UTAUT. In this research study, performance expectancy assesses the students' perceptions about the possible values that they might receive from the usage of the e-exam

system. Several works of research have shown the critical impact that performance expectancy plays in behavioral intention across a variety of e-learning tools (Chu & Chen, 2016; Al-Gahtani, 2016; Merhi, 2015). Furthermore, when compared to the other UTAUT components, performance expectancy was shown to have a stronger relationship with behavioral intention (Chu & Chen, 2016; El-Masri & Tarhini, 2017). It is anticipated that if students believe the electronic examination system is capable of accurately measuring their learning performance and adding value to their educational experience, the likelihood of them adopting the system would be high; otherwise, it is likely to be low. On the other hand, students may be resistant to such technologies and may unwittingly sabotage them by not putting up sufficient effort to do well on the e-exam system if they are dubious of the system's efficacy and instructional worth. As a result, the following hypotheses were formed,

H1: Performance expectancy has a significant impact on students' behavioral intention to use e-exams

Effort Expectancy

Effort expectancy is defined as "the degree of ease associated with the use of the system" (Venkatesh, Morris, Davis, & Davis, 2003). "Ease of use" in the TAM is similar to this concept. In the context of UTAUT, it is hypothesized that effort expectancy has a direct inverse connection with behavioral intention. Student perceptions of using technology for their educational experiences were supportive of the critical role that effort expectancy plays in predicting behavioral intention, as reported by many prior research studies (Al-Gahtani, 2016; Abbasi, Tarhini, Elyas, & Shah, 2015; Oye, Iahad, & Rahim, 2014; Merhi M., 2015). In this research, the students' perceptions about the degree to which the e-exam is free of or needs additional learning to use or real usage effort were measured using effort expectancy. When students consider the system to be simple to use, it is assumed that the system would be adopted and utilized by them. As a result, the following hypothesis was suggested,

H2: Effort expectancy has a significant impact on students' behavioral intention to use e-exams

Social Influence

Venkatesh, Morris, Davis, & Davis, (2003) defined social influence as "the degree to which a person believes that important people believe he or she should adopt the new system. TRA, TPB, and TAM2 use a concept called Social Norm that is comparable to this concept. Additionally, social pressure refers to the external pressure exerted on people by their social environment, which may have an impact on their perceptions and behaviors, leading them to engage in a certain activity in a particular manner (Venkatesh, Morris, Davis, & Davis, 2003). Social influence has a direct impact on behavioral intention since it is predicated on the assumption that individuals would be affected by the opinions of others, leading them to engage in behavior that they otherwise would not have done if the influence had not been there (Ibrahim, Ba'aba, Ismail, & Dawud, 2021). When it comes to social influence, according to Venkatesh & Davis, (2000), it has the most effect in compulsory situations and the least influence in those that are voluntary. It was decided to investigate the effect of social influence on behavioral intention in this research because, in the setting of e-exam systems, students' choice to accept and utilize the systems is affected by the dictates of their lecturers, as well as the opinions of other students (Chu & Chen,

2016; Sharma, Sarrab, & Al-Shihi, 2016; Tosuntaş, Karadag, & Orhan, 2015). Accordingly, the following hypothesis was proposed,

H3: Social influence has a significant impact on students' behavioral intention to use e-exams

Facilitating Conditions

The Facilitating Condition is defined as "the extent to which a person thinks that an organizational and technological infrastructure exists to facilitate the usage of the system" (Venkatesh, Morris, Davis, & Davis, 2003). Facilitating conditions have been identified as critical and influencing factors on human behavior in information systems (Alryalat, Williams, & Rana, 2013; Dwivedi, Rana, Chen, & Williams, 2011; Williams, Rana, Dwivedi, & Lal, 2011) and e-learning systems (Chu & Chen, 2016; Tosuntaş, Karadag, & Orhan, 2015). In this study, facilitating conditions are defined and assessed based on students' views of how effectively they are able to access the necessary technological resources, as well as appropriate policy and operational support to use the e-exam system. Accordingly, the following hypothesis was proposed,

H4: Facilitating Conditions have a significant impact on students' behavioral intention to use e-exams

Computer Anxiety

Anxiety is defined as the degree of apprehension, fear, or discomfort that a person feels in relation to his or her own usage and interactions with technology (Ibrahim, Ba'aba, Ismail, & Dawud, 2021). Furthermore, Ibrahim, Ba'aba, Ismail, & Dawud, (2021) have outlined that anxiety may have an impact on one's feelings of behavioral control while using technology. Computer anxiety may be defined in another way based on the likelihood of a person feeling uncomfortable while using a computer (Venkatesh, Morris, Davis, & Davis, 2003). It is more probable that students will feel worried before and during the usage of an e-exam system when they have a negative attitude about the system, and they will have a lower intention to use the system when they have a negative attitude toward the system (Kohnke, Cole, & Bush, 2014). In addition to that, prior research studies also have found that computer anxiety has a significant impact on computer-related behaviors such as computer use, computer skills, attitudes towards computers, or intentions to use computers or software applications (Saade, Kira, & Nebebe, 2013). In this study, the researchers were mainly focused on identifying the mediating effect of performance expectancy and effort expectancy on the relationship between computer anxiety and behavioral intention. Accordingly, the following hypothesis was proposed,

H5: The relationship between computer anxiety and behavioral intention is mediated by performance expectancy

H6: The relationship between computer anxiety and behavioral intention is mediated by effort expectancy

Habit

Wu, Tao, & Yang, (2007) introduced the concept of habit as a significant construct for predicting system use and attitude-intention toward actual system usage in his initial proposal. Habit has been defined in two different ways according to previous research on the subject. Initially, it was characterized as a previous behavior (Kim & Malhotra, 2012), and next, it was believed to be an individual's belief that a certain set of actions is perceived to be automatic (Wu, Tao, & Yang, 2007). According to the findings of this study, habit is regarded to be a construct that reflects students' prior behaviors toward the repetition of the same pattern. Furthermore, according to Al-Adwan & Smedley, (2013), and Farzin & Dahlan, (2018) there is a direct and significant impact of habit on behavioral intention. Therefore, the following hypothesis is proposed,

H7: Habit has a significant impact on students' behavioral intention to use e-exams

Fear of Infectious Diseases

Fear, according to Mertens, Gerritsen, Duijndam, Salemink, & Engelhard, (2020) is an adaptive emotion that mobilizes energy in a person to cope with a possible threat or danger. Pakpour & Griffiths, (2020) discovered that unexpected and unusual events, such as disease outbreaks, may create anxiety within individuals; and as a result, fear is one of the psychological elements of infectious diseases. This study was carried out during the Covid-19 outbreak and the fear that students have about the cause of infectious disease may also affect the behavioral intention to use the e-examination system. This emphasizes the necessity to assess the mediating effect of performance expectancy and effort expectancy on the relationship between fear of infectious diseases and behavioral intention to use e-exam systems. Accordingly, the following hypotheses were proposed,

H8: The relationship between fear of infectious diseases and behavioral intention mediated by performance expectancy

H9: The relationship between fear of infectious diseases and behavioral intention mediated by effort expectancy

The following conceptual framework explains the study further and is also used to test the stated hypotheses of the study.

Operationalization of Variables

Table 1 shows the operationalization of variables.

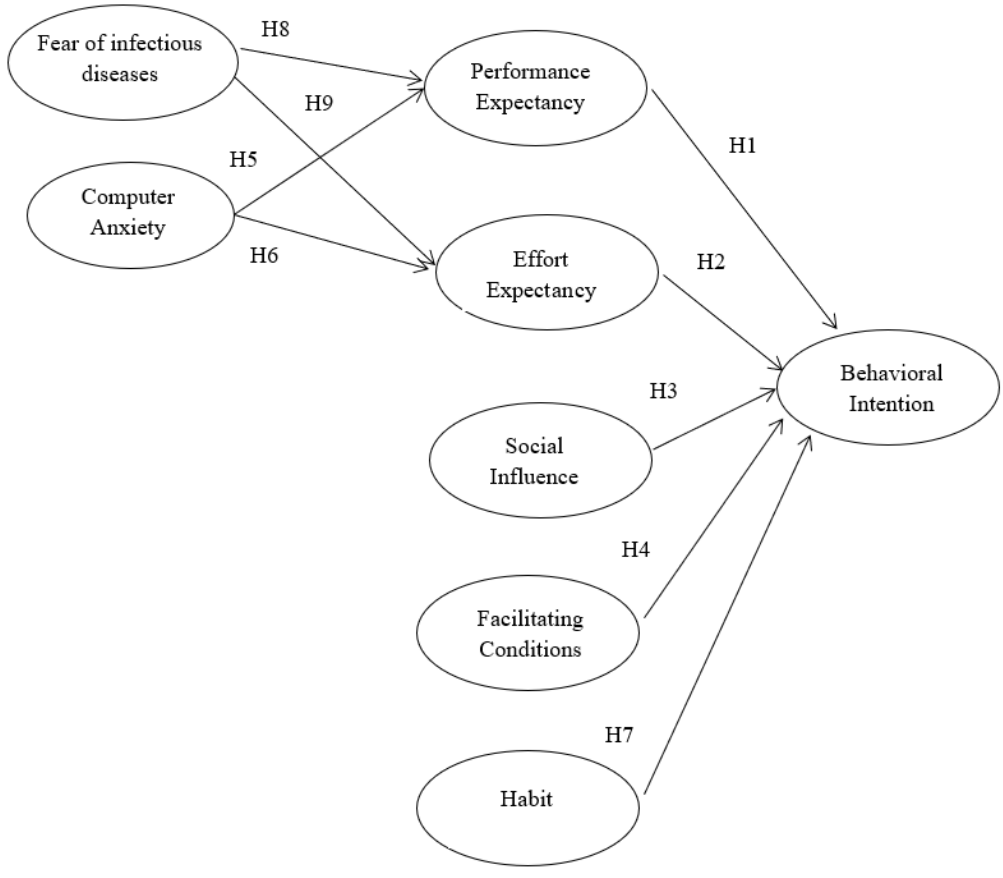

Figure 1: Conceptual Framework

Table 1: Operationalization of variables

Variable	Scale items	Source
Performance expectancy	PE1. I believe that taking the e-exam system could improve my academic results PE2. I think that using the e-exams system could improve my academic performance PE3. I believe taking the e-exams system could accelerate my academic performance PE4. I think the e-exams system could be beneficial to my learning activities	(Farzin & Dahlan, 2018)

Effort Expectancy	EE1. I feel that the e-exam system would probably be easy to use EE2. I think that the e-exam system should be easy for me EE3. I think the e-exam system is understandable EE4. I believe the e-exam system should facilitate exam completion	(Farzin & Dahlan, 2018)
Social Influence	SI1. My lecturers/ supervisors believe I should use the e-exam system SI2. My friends/ batch mates believe I should use the e-exam system SI3. My lecturers/ supervisors/ friends have been helpful in the use of the e-exam system SI4. My lecturers/ supervisors/ friends should support the use of the e-exam system	(Farzin & Dahlan, 2018)
Facilitating Conditions	FC1. I believe I have the resources necessary to use the e-exam system FC2. I think I have the knowledge necessary to use the e-exam system FC3. e-exam system is compatible with other technologies I use FC4. I can get help from others when I have difficulties using the e-exam system	(Farzin & Dahlan, 2018)
Computer Anxiety	AN1. I feel apprehensive about using of e-exam system AN2. It scares me to think that using the e-exam system could make me lose marks (because of time management, concentration, computer crashes, network problems, etc.) AN3. I hesitate to use the e-exam system for fear of making mistakes AN4. e-exam system is somewhat intimidating to me	(Farzin & Dahlan, 2018)
Habit	HA1. The use of the e-learning system has become a regular task for me HA2. I believe my academic performance is depended on my using the e-learning system HA3. I feel that I must use the e-learning system HA4. Using the e-learning system has become natural to me	(Farzin & Dahlan, 2018)

Fear of infectious diseases	CF1. I do not want to leave the house because of the risk of getting infected by different infectious diseases CF2. I am concerned that I may get sick from an infectious disease during the next 6 months CF3. I am feeling anxious about infectious diseases CF4. I am concerned that someone in my immediate family may get sick from an infectious disease during the next 6 months CF5. I am scared about getting infected by an infectious disease	(Raza, Qazi, Khan, & Salam, 2021)
Behavioral Intention	BI1. I intend to continuously use the e-exam system instead of the traditional way of facing exams in the future BI2. I would use the e-exam system to assess my abilities BI3. I plan to take an e-exam system within the next semester BI4. I recommend using the e-exam system instead of the traditional way of facing exams to others BI5. If I assume that the e-exam system will be available to me in the future, I predict that I will intend to use this e-exam system	(Farzin & Dahlan, 2018)

Methodology

The quantitative research method was used in this study, and the research design was single-cross-sectional in nature. Using a self-administered questionnaire, the necessary information was gathered from postgraduates in state universities in Sri Lanka. A total of 167 postgraduates were included in the sample and they were selected using the purposive sampling technique. The researchers have identified postgraduates as a separate group of consumers who are in need of education and as a means of satisfying this need, they have to use e-exam systems during the Covid-19 pandemic. The reason for choosing postgraduate students as the sample is that they can afford the equipment and internet services needed to use e-exam systems better than undergraduate students. Therefore, e-exam systems are more appropriate for postgraduate students than undergraduate students in Sri Lanka. The sample was only limited to state universities as all most all the state universities follow a common method in terms of providing education and conducting examinations, however, private universities have adopted different mechanisms and they are advanced compared with the state universities. 167 respondents were chosen based on the judgement of the researchers on whether the respondents have the ability to afford equipment and internet connections and the postgraduate students who have not used e-exam systems before.

The study was conducted in three stages. First and foremost, a comprehensive review of the literature was conducted in order to collect comprehensive information on the topic of the study.

The constructs have been operationalized through a thorough review of the literature (Farzin & Dahlan, 2018; Raza, Qazi, Khan, & Salam, 2021), and the results have been calculated on a 5-point Likert scale ranging from 1 to 5, with 1 representing strongly disagree and 5 representing strongly agree. Second, a few expert reviews have been conducted to ensure that the questionnaire is accurate and applicable. Following that, pilot research with 20 participants was conducted, and a few wording changes to the final questionnaire were made in light of the comments. As data was collected from a single source, common method bias required further verification; thus, respondents' anonymity was guaranteed and the predictor and criterion variables were located in different parts of the questionnaire (Prayag, Gannon, Muskat, & Taheri, 2020). Moreover, as suggested by Podsakoff, MacKenzie, & Podsakoff (Sources of Method Bias in Social Science Research and Recommendations on How to Control It, 2012), psychological separation of the predictor and criterion variables was done to overcome the common method bias.

The questionnaire that was created included filter questions that were used to select the most appropriate individuals for the sample. In addition, there were two sections in the questionnaire. First, the socio-demographic questions were included in order to create a sample profile, and then the following section assessed performance expectancy, effort expectancy, social influence, facilitating conditions, computer anxiety, habit, fear of infectious diseases, and behavioral intention.

As recommended by Hair, Risher, Sarstedt, & Ringle, (2019), since the structural model of the research study is complex and includes many constructs, indicators, and model relationships, researchers decided to use Smart PLS software to analyze the collected data.

Sample Profile of the Study

The sample of the study is 167 postgraduates in state universities in Sri Lanka and the majority of this sample consisted of males (55.2%) who are of 30-35 years (33.3%). In addition, the majority of the sample use SLT-Mobitel as the internet service provider (50.9%) and 79 (47.9%) respondents have good signal strength. Moreover, the majority of the respondents (71.5%) use laptops as a device to access e-exam systems, and to access the internet they use a wireless internet connection (45.5%). Most importantly, finally, the researcher asked whether the respondents like to use e-exams or not. Accordingly, 90 respondents (54.5%) stated that they were willing to use the e-exam system to continue their studies during the Covid-19 pandemic.

Table 2: Sample profile of the study

		Frequency	Percentage
Gender	Male	93	55.6
	Female	74	44.4
	Total	167	100.00
Age	25-30 years	26	15.8
	30-35 years	55	33.3
	35-40 years	36	21.8

Internet service provider	SLT-Mobitel	84	50.9
	Dialog	76	46.1
Device used to access to e-exam system	Laptop	118	71.5
	Mobile phone	36	21.8
Signal strength of the Internet connection	Excellent	19	11.4
	Good	81	48.5
	Fair	52	31.1
	Poor	15	08.9
Internet connection type	Wireless	75	44.9
	Wired	38	22.8
	Mobile connection	54	32.3
Whether respondents like to use the e-exam system	Yes	92	55.0
	No	75	45.0

Source: Survey Data, 2021

Data Presentation and Analysis

After collecting the data, the gathered data were screened to detect missing values and outliers. Since the questionnaire was revised in response to expert feedback and pilot testing, it is now easier for respondents to complete the questionnaire, and as a result, there were very few missing values in the data set. The median was imputed to the identified missing values as suggested by Little & Rubin (Statistical Analysis with Missing Data, 2002). Box plots were used to identify the presence of outliers (Aguinis, Gottfredson, & Joo , 2013), and the four cases identified as outliers were omitted from the dataset.

Additionally, factor analysis was used to assess the uni-dimensionality of the construct. All factor loadings were statistically significant and were proven to be more than 0.6, as suggested by Hair, Black, Babin, & Anderson, (2010). Later, the Normality of the data was tested using Skewness and Kurtosis values; according to the standard, Skewness and Kurtosis values should be in the range of +2 and -2 for the data to be considered normally distributed. The values for Skewness and Kurtosis are shown in Table 3 and all the values are in the threshold level, therefore, the normality of the data is ensured.

Table 3: Results of Test of Normality

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Performance expectancy	-0.117	0.188	-0.830	0.374
Effort expectancy	-0.267	0.188	-0.835	0.374
Social Influence	0.135	0.188	0.206	0.374
Facilitating conditions	-0.215	0.188	-0.722	0.374

Computer Anxiety	-0.244	0.188	-1.030	0.374
Habit	0.170	0.188	-0.612	0.374
Fear of infectious diseases	-0.344	0.188	-0.537	0.374
Behavioral intention	-0.229	0.188	-0.867	0.374

Source: Survey Data, 2021

The AVE and CR values were used to determine the convergent validity of the data. According to the standard, AVE values should be greater than 0.5, and CR values should be greater than 0.7 (Malhotra, 2010). The results of the convergent validity test were within the standard values, ensuring the convergent validity of the data. In addition, Cronbach's alpha value was used to test the reliability of the data. Accordingly, if Cronbach's alpha value is higher than 0.7, the data ensured internal consistency. All the Cronbach's alpha values were greater than 0.7 ensuring the reliability of data. Moreover, multicollinearity among the variables was tested using the VIF value; and as per Hair, Sarstedt, Ringle, & Mena (2012), if the VIF value is less than 10, it guarantees the absence of a multicollinearity issue. The VIF values were less than 10 and the results of convergent validity, reliability test, and VIF values are shown in Table 4.

Table 4: Results of Convergent Validity Test

Variable	AVE	CR	Cronbach's Alpha Value	VIF
Performance expectancy	0.885	0.968	0.956	4.842
Effort expectancy	0.803	0.942	0.917	5.918
Social Influence	0.649	0.879	0.820	2.709
Facilitating conditions	0.764	0.928	0.894	4.590
Computer Anxiety	0.797	0.940	0.915	1.702
Habit	0.739	0.919	0.884	2.088
Fear of infectious diseases	0.609	0.886	0.846	1.334
Behavioral intention	0.875	0.972	0.964	

Source: Survey Data, 2021

Discriminant Validity was tested using Fornell-Larcker Criterion and according to Fornell & Larcker (1981), the square root of the AVE of a construct should be greater than the inter-construct correlations. The results of the Fornell-Larcker criterion test meet the standard, ensuring the discriminant validity of data. The results are shown in Table 5.

Hypotheses Testing Using Smart PLS

Structural Equation Modeling (SME) is a comprehensive data examination technique of the second generation that analyzes casual relationships that have been conceptually established (Iqbal, et al., 2021). It enables researchers to investigate the relationships that exist between constructs and variables. SME is often regarded as the most effective method for determining direct and indirect paths since it examines latent components that are difficult to investigate and that are unobservable. SEM comprises inner and outer model analyses, which investigate the connections between independent and dependent variables, as well as the links between latent

components and their observable points. PLS is primarily concerned with variance analysis, which may be accomplished using Smart PLS (Vinzi, Trinchera, & Amato, 2010). As a result, this approach has been chosen for the current investigation.

Table 5: Results of Fornell-Lacker Criterion

	Behavioral Intention	Computer Anxiety	Fear of infectious diseases	Effort Expectancy	Facilitating Conditions	Habit	Performance Expectancy	Social Influence
BI	**0.935**							
CA	-0.503	**0.893**						
CF	0.414	-0.161	**0.780**					
EE	0.863	-0.588	0.357	**0.896**				
FC	0.778	-0.614	0.257	0.861	**0.874**			
H	0.750	-0.438	0.476	0.684	0.628	**0.859**		
PE	0.845	-0.536	0.384	0.864	0.817	0.669	**0.940**	
SI	0.716	-0.377	0.430	0.759	0.693	0.649	0.763	**0.806**

Source: Survey Data, 2021

Table 6: Results of PLS-SME analysis

	Effects	Relationships	β	T-value	P-value
Direct effects	H1	Performance Expectancy-> Behavioral Intention	0.317	3.813	0.000
	H2	Effort Expectancy-> Behavioral Intention	0.416	4.429	0.000
	H3	Social Influence-> Behavioral Intention	-0.015	0.271	0.787
	H4	Facilitating Conditions-> Behavioral Intention	0.009	0.100	0.920
	H7	Habit-> Behavioral Intention	0.258	4.193	0.000
Specific indirect effects	H5	Computer Anxiety-> Performance Expectancy-> Behavioral Intention	-0.154	3.572	0.000
	H6	Computer Anxiety-> Effort Expectancy-> Behavioral Intention	-0.226	3.991	0.000
	H8	Fear of infectious diseases -> Performance Expectancy-> Behavioral Intention	0.097	2.676	0.008
	H9	Fear of infectious diseases-> Effort Expectancy-> Behavioral Intention	0.112	3.023	0.003

Total indirect effect	Computer Anxiety-> Behavioral Intention	-0.381	5.929	0.000
	Fear of infectious diseases-> Behavioral Intention	0.209	4.032	0.000

Source: Survey Data, 2021

As per Table 6, In terms of the direct effects on behavioral intention to use e-exam systems except for social influence and facilitating conditions, other variables namely, performance expectancy (β= 0.317, p = 0.000< 0.05), effort expectancy (β= 0.416, p = 0.000< 0.05) and habit (β= 0.258, p = 0.000< 0.05) have a significant impact on behavioral intention. When considering the indirect effects of computer anxiety on behavioral intention, a negative significant impact with the mediating effect of performance expectancy (β= -0.154, p = 0.000< 0.05) and effort expectancy (β= -0.226, p = 0.000< 0.05) can be seen. Moreover, the indirect effect of fear of infectious diseases on behavioral intention through the mediating effect of performance expectancy shows a significant impact (β= 0.097, p = 0.008< 0.05), and with the mediating effect of effort expectancy also it shows a significant impact (β= 0.112, p = 0.003< 0.05). The total indirect effect of computer anxiety shows a negative significant impact on behavioral intention (β=-0.381, p = 0.000< 0.05) and fear of infectious diseases shows a significant direct effect on behavioral intention (β= 0.209, p = 0.000< 0.05).

To find out whether there are discrepancies between the observed and model data, model fit is used. According to Malhotra, (2010), it is better to choose multiple model fit indices. Consequently, R square and Standardized Root Mean Square Residual (SRMR) are used to assess the model fit. The results are shown in Table 7.

Table 7: Results of Model Fit

Construct	R square	Adjusted R square	SRMR
Behavioral Intention	0.817	0.811	0.074
Effort Expectancy	0.416	0.409	
Performance Expectancy	0.379	0.371	

Source: Survey Data, 2021

According to the R square value, 81% of the variation in behavioral intention is described by performance expectancy, effort expectancy, social influence, facilitating conditions, habit computer anxiety, and fear of infectious diseases. 41% of the variation in effort expectancy is explained by the fear of infectious diseases and computer anxiety. Moreover, 37% of the variation in performance expectancy is explained by the fear of infectious diseases and computer anxiety. Henseler, Hubona, & Ray, (2016) and Cho, Hwang, Sarstedt, & Ringle, (2020) have outlined that the SRMR value should be less than 0.08 for a sample size greater than 100 to ensure the model fit. According to the results obtained, the SRMR value is 0.07; thus, it shows a significant model fit for this study.

Discussion and Conclusion

With the emergence of the Covid-19 pandemic, most of the sectors including the educational sector had to face numerous challenges. In order to continue the operations in educational institutes, policymakers in higher educational institutes decided to move to electronic learning. As one of the main aspects of e-learning, e-exams also play a vital role. Many prior studies have focused on the technological advancements in e-exam systems, however, the academic research on students' perspectives on using e-exam systems falls short. Considering the existing contextual and conceptual gap, this research focused on identifying factors affecting postgraduates students' intention to use e-exam systems during the Covid-19 pandemic. Accordingly, the selected sample was identified as a separate group of consumers who have a unique and distinct need for education, and as a means of satisfying this need, they use e-exams systems. The summary of the results obtained through the analysis is shown in Table 8 and Figure 2.

Table 8: Summary of results obtained

Hypothesis	Survey findings
H1: Performance expectancy has a significant impact on students' behavioral intention to use e-exams	Supported
H2: Effort expectancy has a significant impact on students' behavioral intention to use e-exams	Supported
H3: Social influence has a significant impact on students' behavioral intention to use e-exams	Not supported
H4: Facilitating conditions have a significant impact on students' behavioral intention to use e-exams	Not supported
H5: The relationship between computer anxiety and behavioral intention is mediated by performance expectancy	Supported
H6: The relationship between computer anxiety and behavioral intention is mediated by effort expectancy	Supported
H7: Habit has a significant impact on students' behavioral intention to use e-exams	Supported
H8: The relationship between fear of infectious diseases and behavioral intention is mediated by performance expectancy	Supported
H9: The relationship between fear of infectious diseases and behavioral intention is mediated by effort expectancy	Supported

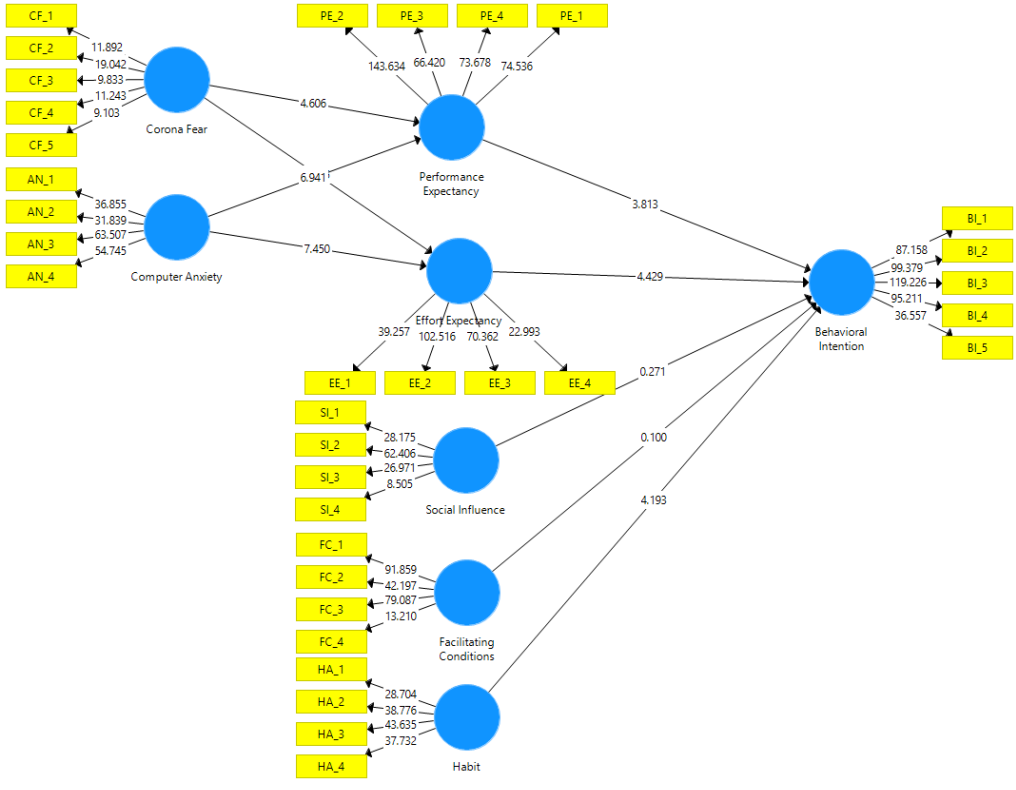

Figure 2: The summary of PLS-SME results

According to the results of the PLS-SME analysis of this study, it was found that performance expectancy has a significant impact on behavioral intention to use e-exam systems. This simply means that the student's behavioral intention would be high if they believe that e-exam systems would help them succeed and their exam results would accurately represent their learning achievements. This finding further agreed with the findings of Al-Gahtani, (2016), Oye, Iahad, & Rahim, (2014), and Farzin & Dahlan, (2016). Secondly, the researcher hypothesized that effort expectancy has a positive significant impact on behavioral intention and the hypothesis was accepted according to the results obtained from the analysis. This result also agreed with the findings of Al-Gahtani, (2016), Oye, Iahad, & Rahim, (2014), and Abbasi, Tarhini, Elyas, & Shah, (2015) which simply means that it is critical to make sure that any e-exam system is simple to use, so that students will have high behavioral intentions to accept and use it.

The third objective of the study is to identify the impact of social influence on behavioral intention to use the e-exam system and the results showed an insignificant impact of social influence on behavioral intention. Most of the prior research findings have shown that social influence has a positive significant impact on behavioral intention to use e-exam systems (e.g.: Venkatesh, Morris, Davis, & Davis, 2003; Chen & Chen, 2015; Tan, 2013). However, the insignificant impact of social influence on behavioral intention in using e-learning systems is further approved by prior researchers such as Gunasinghe, Hamid, Khatibi, & Azam, (2019),

Khechine & Lakhal, (2018) and Wrycza, Marcinkowski, & Gajda, (2017). These researches have outlined that the insignificant impact is possible due to the voluntary nature of using e-learning by higher education institutes; for, in a voluntary usage situation, social influences play a passive role in changing user perceptions of technology rather than acting as a direct influencer on usage intention.

Considering the fourth objective, the researcher tested the impact of facilitating conditions on behavioral intention to use e-exam systems, and the results showed a positive but insignificant impact on behavioral intention. Prior research studies (Ibrahim, Ba'aba, Ismail, & Dawud, 2021; Venkatesh, Morris, Davis, & Davis, 2003; Alryalat, Williams, & Rana, 2013) have found that facilitating conditions have a positive and significant impact on behavioral intention. However, Dwivedi, Rana, Chen, & Williams, (2011) and Raza, Qazi, Khan, & Salam, (2021) disagree with the findings of this study. It is argued that students are dissatisfied with the level of assistance. Additionally, it may be also claimed that students are hesitant to embrace technology and, as a result, are dissatisfied with the assistance they get since their crucial concern is weak internet connectivity.

Considering the fifth and sixth objectives of the study, the researchers tested the mediating effect of performance expectancy and effort expectancy on the relationship between computer anxiety and behavioral intention, and the results showed the presence of the mediating effect. In prior studies, computer anxiety has been used as an independent variable and it shows that computer anxiety has an inverse impact on behavioral intention (e.g.: Farzin & Dahlan, 2016). In this study, the researcher found a mediating effect of performance expectancy and effort expectancy on the relationship between computer anxiety and behavioral intention which has not been tested before.

The seventh hypothesis was focused on habit and behavioral intention to use e-exam systems, and the results showed that habit has a positive and significant impact on behavioral intention to use e-exam systems. This finding was further supported by Farzin & Dahlan, (2018) Kishore & Sequeira, (2014), and Al-Qeisi, Dennis, Alamanos, & Jayawardhena, (2014).

The eighth and ninth hypotheses tested the mediating effect of performance expectancy on the relationship between fear of infectious diseases and behavioral intention and computer anxiety and behavioral intention. In prior studies (e.g.: Raza, Qazi, Khan, & Salam, 2021) fear of infectious diseases has been used as a moderating variable in assessing the behavioral intention to use e-learning systems. In this study, it was found that fear of infectious diseases has a positive significant total indirect impact on behavioral intention to use e-exam systems. This simply means that when the fear of getting exposed to infectious diseases of individuals increases, they reject to travel and they avoid physical meetups as much as possible. Consequently, the intention to use remote exam systems increases. In such a situation, if the level of effort required by students to utilize a given e-examination system is excessive and the system's performance is inadequate, the desire to embrace the said e-examination system will likely diminish, potentially resulting in students withdrawing from their courses. If the e-exam system is efficient and performs well, the likelihood of its adoption will be higher, as it would require minimal effort from the users. Consequently, the results show that performance expectancy and effort expectancy mediate the relationship between fear of infectious diseases and behavioral intention to use e-exam systems. This finding will support to fill the existing gap in the literature.

As implications of the study it can be said that when it comes to the student's perspective, the intention of using an e-exam system can result in a significant number of behaviorally connected issues that need to be addressed. The aforementioned challenges can bring a number of benefits to the main players and stakeholders in the higher education sector, and identifying them can also help establish a set for future scholars who are able to handle the recognized problems in the appropriate manner (Farzin & Dahlan, 2018).

Limitations and Future Research Suggestions

There are a number of drawbacks to this research study. First and foremost, the study's sample size of 167 postgraduate students from Sri Lankan state universities is a significant limitation. The research was also unable to examine some of the most significant ideas from the respondents since the study was limited to a quantitative methodology. Therefore, as recommendations for future study, the researchers propose that a qualitative method be used, in order to explore more valuable insights from the respondents. Furthermore, this research may be expanded to include additional groups such as undergraduates, students enrolled in diploma programs, etc.

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