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DETERMINING THE FACTORS THAT AFFECT THE USE OF VIRTUAL CLASSROOMS: A MODIFICATION OF THE UTAUT MODEL

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Abstract				
Aim/Purpose	The aim of this study was to examine the factors that may influence the use of virtual classrooms.			
Background	The coronavirus (COVID-19) pandemic has affected and interrupted several as pects of our lives, including education. Most educational institutes and universities have changed their teaching mode from being face-to-face or fixable learning to 'emergency remote education'. As a result, virtual classrooms were utilised in most of these universities to keep the continuity of teaching and delivering education to their students.			
Methodology	Through an online survey, data was collected from 235 of the teaching staff at the University of Ha'il, Saudi Arabia. Structural equation modelling (SEM) us- ing AMOS was applied to analyse the data and testing the hypothesis of the proposed model.			
Contribution	The study findings have a theoretical, methodological, and practical contribu- tion in the area of virtual classrooms. In terms of its theoretical contribution, this research has enriched the literature on virtual classrooms. Most of previous studies used the basic UTAUT model or other models for different technology,			

such as LMS, Mobile Cloud Learning and social websites. Few studies have focused on virtual classrooms, and, based on the best knowledge of the researcher, this study is the first study that has extended and modified the UTAUT model by adding an external factor (mobility) with virtual classrooms technology. Thus, it contributes theoretically to IS acceptance literature in general, and to UTAUT models specifically.

> In terms of methodological contribution, this study assessed all latent constructs in the model in a different context (Saudi Arabia), and tested them

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	through an advanced analysis technique, which some call a second-generation multivariate, by applying a two-step rule in AMOS (CFA and SEM). The CFA has shown solid results that can measure all constructs in the model after delet- ing a few items that show a low factor loading to the construct. According to Awang (2015), examining the construct, convergent and discriminant validities is essential during the CFA before moving on a step and analysing data using SEM. Thus, this study has validated all constructs and its items using CFA which can be further used in a different culture, specifically in an Arab culture, such as Saudi Arabia.
Findings	The results showed that effort expectancy and performance expectancy are sig- nificant predictors of behaviour intention toward the use of virtual classrooms. However, in contrast of our expectation, social influence, facilitating condition and mobility were insignificant factors and had no influence on teaching staff's behaviour intention toward the use of virtual classrooms.
Recommendations for Practitioners	This research has made a practical contribution. The findings of this study showed which factors can determine the use of virtual classrooms. Decision makers and university organizations and administration can improve their vir- tual classrooms services based on the factors that determine their use. Taking care of that will lead to an increased use of virtual classrooms and lead to a suc- cessful use of virtual classrooms, which will result in huge benefits in applying virtual classrooms in the teaching process.
Recommendations for Researchers	Researchers may develop different models and examine other factors to assess their influence on the usage of different technologies. Understanding the fac- tors that may influence the usage of a technology leads to an increase in its us- age and adoption.
Impact on Society	This study may increase the usage of virtual classrooms among teaching staff by understanding and examining the factors that might determine the use of virtual classrooms.
Future Research	Future studies could examine the moderation variables to establish their impact. This study relied on only a purely quantitative design study. Future research might employ a mixed method using both quantitative and qualitative designs to apply an interview after the quantitative study for a better insight and deeper knowledge as well as confirming the quantitative results.
Keywords	unified theory of acceptance and use of technology, UTAUT, structural equa- tion modelling, virtual classrooms, emergency remote education, online learn- ing, distance education

INTRODUCTION

After the first identification of COVID-19 in December 2019, the World Health Organization (WHO) announced in March 2020 that Covid-19 is a global pandemic and warned about its potential spreading. To slow down its spread, most countries around the world put certain protocols in place, for example, partial or a complete lockdown, curfews, and regulations on social distancing. The educational institutes and universities were shut down to reduce the chance of spreading the infection as having groups of people in proximity and indoors was seen as a 'high risk' situation for the transmission of the virus between students. Thus, 1.5 billion students – approximately 90% of the student population globally – of all ages who were enrolled were affected and their education was interrupted (UNESCO, 2020). As a result, and for ensuring education continuity, emergency education through remote teaching was put into practice using various delivery modes.

In these critical times, there have been drastic changes in how learning and teaching takes place while students and their teachers are physically not at their universities and separated from their co-learners. During the Covid-19 pandemic, different names of educational practices have been used in different countries (e.g., e-learning, distance education, online learning). However, these terms do not present what is being adopted during this education interruption, which could be better termed as emergency remote education (ERE) (Bozkurt & Sharma, 2020). Even though all these terms are used interchangeably, they are different. Distance education, for example, is an activity that is planned and implemented based on a practical and theoretical knowledge that is specific to its nature and field. On the other hand, emergency remote education is about implementing a form of education during in crisis using all available resources, including online and/or offline formats. During the Covid-19 pandemic, most countries have applied emergency remote education instead of distance education (Bozkurt & Sharma, 2020).

In Saudi Arabia, the Saudi Ministry of Health (MoH) confirmed the first Covid-19 case on March 2, 2020. On March 8, 2020, the Ministry of Education (MoE) declared that all institutes, including private and public universities and schools, should be closed, while education should be continued and provided to all students through emergency remote education without delay. Thus, universities continued to deliver education through different virtual classrooms such as Blackboard Collaborate, Zoom, Webex, and Microsoft Teams. Given this timely response to the Covid-19 pandemic and the huge effort put into raising awareness about its threat among the world's population, the switch to emergency remote learning was not expected, but has been welcomed among educational institutes, teachers, and students.

These virtual classrooms enable students to access learning materials without being restricted to location or time, and the use of its communication features in their learning process boosts their academic productivity and performance (Fidani & Idrizi, 2012). However, providing these virtual classrooms for teaching staff cannot guarantee that students will be motivated to use these systems effectively. It is essential to investigate and determine the factors that influence teaching staff to adopt and use virtual classrooms to educate their students. Furthermore, since the use and adoption of technology is considered as a complex phenomenon that involves a complex interplay, whether with internal or external factors, several researchers showed the need for developing models for examining which factors determine the successful use of technology (Fathema et al., 2015; Findik-Conkuncay et al., 2018; Lwoga & Komba, 2015). To improve both the teaching and learning experience, education policy makers must understand which factors may facilitate or hinder the adoption of e-learning systems (Brown, 2010; El-Masri & Tarhini, 2017). A limited number of studies has investigated the challenges that educational institutes in developing countries are faced with (Alalwan et al., 2015; El-Masri & Tarhini, 2017; Ramaiah, 2014). In addition, the majority of IS models - in particular, UTAUT - have not been extensively used and tested within a non-Western educational environment, such as developing Arab countries (El-Masri & Tarhini, 2017; Kamoun & Almourad 2014; Zhao et al. 2012). Thus, this study applies the UTAUT model with an additional factor, "mobility", to determine the factors that may influence the adopting and use of virtual classrooms. According to Adzharuddin and Ling (2013), understanding the barriers (factors) that may influence users' behavioural intention to use and accept technology is essential and leads to attracting more users to use and accept this form of technology.

LITERATURE REVIEW

To better understand which factors could influence the use and adoption of technologies, several theoretical models have been developed, including the Theory of Reason Action (TRA), the Technology Acceptance Model (TAM), the Theory of Planned Behaviour (TPB), and the Diffusion of Innovation Theory (DOI). By considering the above-mentioned models and their influencer factors, the Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. (2003). UTAUT has four core constructs which predict users' behaviour intention and their actual

use (performance expectancy, effort expectancy, social influence, and facilitating conditions). The UTAUT model is the latest powerful model that explains the use and adoption of different technologies due to its higher explanatory power of behavioural use of technology, which is widely applicability in different contexts and capabilities (Bradley, 2009; Sultana, 2020).

In the context of higher education, UTAUT has been modified to be suitable for the different technology used on various devices (Anderson et al., 2006), social media (Gruzd et al., 2012), access publishing (Lwoga & Questier, 2014), and online learning (Baytiyeh, 2016; Buchanan et al., 2013; Kocaleva et al., 2015; Pynoo et al., 2011). There were very few studies that have empirically examined the use and adoption of a Learning Management System (LMS) from the overview of teachers as they mostly examined the adoption among students. Williams et al. (2015) reviewed the literature regarding the use of UTAUT with different technologies, and the results showed that of 174 published articles in journals that were analysed, only two included academic teaching staff as participants of their studies (i.e., Anderson et al., 2006; Debuse et al., 2008). Moreover, most IS models, especially UTAUT, have not been extensively used or tested in non-Western cultures, such as developing Arab countries (Alalwan et al. 2015; El-Masri & Tarhini, 2017; Kamoun & Almourad, 2014; Zhao et al. 2012).

In the Saudi context, there has been a recent move toward the use of the UTAUT model for examining the adoption of different technology. Al Marwani (2016) conducted a study using the UTAUT model for determining the factors which influence teachers' and learners' intention toward the use of mobile learning (m-learning) at Taibah University, and the results showed that facilitating conditions, social influence, hedonism, habit, performance expectancy and motivation have a positive effect on behaviour intention and could explain the 49.3% variance of the behaviour intention construct.

Moreover, Alharbi et al (2017) conducted a study using UTAUT for examining the factors that may influence the intention and usage of m-learning among faculty members. The results revealed that performance experience, effort expectancy, facilitating condition and social influence predicted the level of adoption of m-learning among faculty members, and 76% of the variance in behaviour intention constructs was found to be because of these factors. In the same year, another similar study was conducted by Alasmari (2017) to examine the factors that influence the learners' acceptance of m-learning. The results showed that social influence, learning expectancy, mobile learning characteristics, self-management, facilitating conditions and effort expectancy were all factors that could be used to predict the use of M-learning.

Zalah (2018), on the other hand, conducted a study using a modified UTAUT for examining the factors that might influence the acceptance and use of e-learning in secondary schools in Jazan City in Saudi Arabia, and the results showed that anxiety had a negative effect on teachers' use of e-learning. Moreover, other factors, such as effort expectancy, attitudes, education performance were determinants of teachers' intention toward the use of e-learning. Similarly, Alshehri et al. (2019) recently conducted a study to examine the factors that might influence learners' acceptance and use of a Learning Management System (LMS) at King Khalid University, and the results revealed that technical support, social influence and performance expectancy were determinants in influencing learners' intention toward the use of LMS, while the other factors such as facilitating conditions and effort expectancy were not predictors on influencing learners' intention toward the use of LMS. Additionally, Alasmari and Zhang (2019) conducted a study in the same year by applying UTAUT for examining the factors that might influence the acceptance and use of M-learning among students, and the results showed that facilitating conditions were not a significant predictor of the behaviour intention of learners/students toward the use of m-learning. Moreover, other factors such as effort expectancy, social influence, learning expectancy and characteristics of m-learning were significant predictors of students' behaviour intention toward the use of m-learning technology.

However, none of the previous studies have applied UTAUT to virtual classrooms. A study of Ibrahim et al. (2018) examined the UTAUT constructs and its effects on ICT adoption in the context of

Ghana. The finding of their study showed that the facilitating condition was the strongest predictor, and all other external factors had an influence on behaviour intention toward the use of ICT. Almaiah et al. (2019) applied the UTAUT model to examine the effects of some factors on students' acceptance of mobile learning applications in higher education. The results of their study showed that perceived information quality, perceived compatibility, perceived trust, perceived awareness, availability of resources, self-efficacy, and perceived security are the main motivators of students' acceptance of mobile learning system. Aliaño et al (2019) conducted a study to determine factors that significantly influence the acceptance and intent to use smartphones and tables as resources for learning in university contexts. However, the influence of mobility constructs on the behaviour intention of teaching staff toward the use of virtual classrooms has not been examined. In responding to these gaps, this study aims to fill these gaps by extending and modifying the UTAUT model to include an additional construct, namely mobility, and examining the influence of all factors in the proposed model on teachers' acceptance and use of virtual classrooms. This study will assist practitioners and policymakers to gain a better and deeper understanding about factors that might influence the decision of teaching staff's decision to accept and use virtual classrooms in order to set strategies and enhance the acceptance and adoption of virtual classrooms among teaching staff.

RESEARCH HYPOTHESES

PERFORMANCE EXPECTANCY (PE)

Performance expectancy (PE) refers to the expectation in regards to attaining goals by using a system or technology (Abu-Al-Aish & Love, 2013; Sultana, 2020; Venkatesh et al., 2003). With virtual classrooms, PE refers to the efficiency and effectiveness of retrieving information and learning by using virtual classrooms at anytime and anywhere (Sultana, 2020). Carlsson (2006) conducted a study and highlighted that PE had a direct positive effect on behaviour intention (BI)toward the use of mobile devices. Other studies (e.g., Saade & Bahli 2005; Sultana, 2020; Venkatesh et al., 2003), found a significant positive effect of PE on BI. Thus, the hypothesis formulated is based on that:

H1: PE has a positive effect on the behaviour intention of teaching staff toward the use of virtual classrooms.

EFFORT EXPECTANCY (EE)

"Effort Expectancy (EE) refers to the degree of ease associated with the use of the system" (Venkatesh et al., 2003, p. 450). In the context of virtual classrooms, EE refers to the teaching staff's perceived ease of using virtual classrooms. In several previous studies, EE was found to be a predictive factor that can influence behaviour intention of using m-learning (Abu-Al-Aish & Love, 2013; Sultana, 2020; Venkatesh et al., 2003). Thus, the influence of EE on behaviour intention of virtual classrooms needed to be examined, so the following hypothesis is formulated:

H2: EE has a positive effect on the behaviour intention of teaching staff toward the use of virtual classrooms.

Social Influence (SI)

Social influence (SI) refers to the view of other important people regarding the use of a specific technology. In the virtual class context, university teaching staff and colleagues were sufficiently important individuals that they could have social influence. According to Venkatesh et al. (2003), SI becomes a significant predictor when the use of a new system or technology is mandatory rather than being implemented in a voluntary setting. Previous studies found SI to have a significant effect on BI (Harrison et al. 1997; Venkatesh & Davis, 2000). Thus, the following hypothesis is formulated:

H3: SI has a positive effect on the behaviour intention of teaching staff toward the use of virtual classrooms.

FACILITATING CONDITION (FC)

Facilitating conditions (FC) refers to the support provided by institutes for using technology and systems (Venkatesh et al. 2003). In the context of virtual classrooms, FC refers to the organization support provided to teaching staff to facilitate remote access to resources, platform training, and overcoming challenges regarding the use of virtual classrooms. Previous studies have found that FC has a positive effect on behaviour intention (Cheong et al., 2004; Venkatesh et al., 2003). Based on previous studies, the hypothesis in this study is formulated based on that:

H4: FC has a positive effect on teaching staff's behaviour intention toward the use of virtual classrooms.

Mobility

Mobility refers to a flexible accessing of a virtual class platform without any limitation of location or time (Peters, 2007). Previous studies found that mobility had a significant positive effect on BI of mlearning (Kargin & Basoglu, 2006; Mallat et al., 2008). In the context of a virtual class, mobility also could have a positive impact on teaching staff's behaviour intention toward the use of virtual class-rooms. Thus, the hypothesis is formulated based on that:

H5: Mobility has a positive effect on teaching staff's behaviour intention toward the use of virtual classrooms.

BEHAVIOUR INTENTION (BI)

BI refers to the willingness to use a specific technology or system (Ajzen, 1992). According to the study of Venkatesh et al. (2003), BI has a positive effect on the actual use of technology. Furthermore, previous studies have found a positive effect of BI on actual use of technology (AU) (Abu-Al-Aish & Love 2013; Al-Adwan et al., 2018; Sultana, 2020; Venkatesh & Davis, 2000; Venkatesh et al., 2003). Thus, the hypothesis is formulated based on that:

H6: BI has a positive effect on teaching staff's actual use of virtual classrooms.

The proposed research model of this study is shown in Figure 1.



Figure 1. Proposed research model of this study

METHODOLOGY

Research Design

The design of this study is purely quantitative, which employs a survey for collecting data from the target population. According to Creswell (2013), a quantitative research is one research type that is used to explain a phenomenon by using collected numerical data, and this data needs to be analysed by using a mathematical approach, specifically a statistical approach. Kumar et al. (2008), on the other hand, stated that a quantitative approach is formal, systemic, and objective, which can assist in testing and describing the relationships, causes and effects between different variables. The aim of this study is to apply and modify the UTAUT model with an additional factor, "mobility", to examine and determine the factors that might influence teaching staff behaviour intention toward the use of virtual classrooms.

PARTICIPANTS AND PROCEDURE

The data was collected using an online survey that consisted of two parts: the first part had six questions with the intention of acquiring demographic information, while a second part had 34 questions that would measure the factors in the proposed model. The online survey was designed by using a Google form, then randomly sent by email to 320 teaching staff in different faculties such as the Faculty of Education, Computer Science, and Art at the University of Ha'il, between March and May 2020. A total of 255 teaching staff responded to the survey, but only 235 surveys were used for further analysis due to missing data and incomplete survey responses. The rate of response of the survey was around 74%. Thus, the minimum suggested sample size of 10 cases per dependent variable, as suggested by Hair et al. (2010), was achieved. The proposed model had seven constructs. Thus, the sample size was convenient and can be used further for statistical analysis.

The language of the survey was in English. Then, it was translated to the Arabic language as the targeted population in University of Ha'il uses Arabic as their main language for teaching and learning. The completed survey was first translated into Arabic, then translated back to English, after which the two English surveys were compared to ensure that the English to Arabic translation was accurate. A pilot study was then carried out involving 30 teaching staff who used virtual classrooms for their teaching, and five experts in the field of educational technology for confirming survey content validity (Sekaran & Bougie, 2011). Some further modifications to the survey were made based on the feedback of experts and teaching staff who participated in the pilot study. It should be mentioned that at the beginning of the survey each participant was advised about the main aim of the study, and participants were given a right to withdraw from participating in the survey at any time. Ethical approval for conducting this research was received from the Research Ethics Committee (REC) at the University of Ha'il.

INSTRUMENT

The survey had two parts. The first part measured demographic information such as gender, academic position, device used and whether the system used for virtual classrooms, etc., was self-designed, while the second part adapted and modified items that measured all constructs in the proposed model. These items measured most constructs in the proposed model such as performance expectancy, effort expectancy, social influence, facilitating condition, behaviour intention and the actual use, and were adapted from Venkatesh et al. (2003) and Venkatesh et al. (2012). The items that measured the mobility construct were adapted from the studies of Shorfuzzaman and Alhussein (2016) and Sultana (2020). All the items that measured these constructs involved a five-point Likert scale ranging from 5 "strongly agree" to 1 "strongly disagree".

DATA ANALYZING AND FINDINGS

PART 1: ANALYSING THE RESPONDENTS' DEMOGRAPHIC INFORMATION

A total of 255 teaching staff responded to the survey, but only 235 surveys were used for analysis owing to incomplete responses and invalid missing values. Table 1 shows information regarding the respondents' gender, academic position, the device used for virtual classrooms and training. In terms of gender of the respondents, 151 (64.3%) were male teachers, and 84 (35.7%) were female teachers. In terms of academic position, the results were mixed. Most of the respondents were an assistant professor 123 (52.3%), lecturer 47 (20%), associate professor 37 (15.7%), professor 18 (7.7%) or teaching assistant 10 (4.3%). Regarding the device used for teaching through a virtual class, most of the respondents used a laptop 146 (62.1%), then the personal computer was in second place with 44 (18.7%), while some respondents were in favour of using a smart phone 36 (15.3), and a few used tablet devices 9 (3.8%). Regarding training provided for teachers to conduct virtual teaching classrooms, the majority reported that they had been given training 158 (76.2%), while 77 (32.8%) had not been given any training.

Characteristics	Ν	%
Gender		
Male	151	64.3
Female	84	35.7
Academic Position		
Professor	18	7.7
Associate Professor	37	15.7
Assistant Professor	123	52.3
Lecturer	47	20.0
Teaching Assistant	10	4.3
Device used		
РС	44	18.7
Laptop	146	62.1
Smart phones	36	15.3
Tablet	9	3.8
Training		
YES	158	67.2
NO	77	32.8

Table 1.	Respondents'	descriptive	information
	reoponeento	accourper e	

PART 2: APPLYING CONFIRMATORY FACTOR ANALYSIS (CFA) AND STRUCTURAL EQUATION MODELLING (SEM)

Pooled Confirmatory Factor Analysis (CFA) is the best way for validating the measurement model owing to its ability to take into consideration the different forms of construct correlations and measurement errors (Hair et al., 2010). It can handle multiple numbers of constructs in the same treatment. Furthermore, it assists in avoiding identification problems because of the few items that measure constructs (Awang, 2015). During CFA, the measurement model needs to be developed by assessing the construct validity, convergent and discriminant validity (Awang, 2015).

The construct validity can be assessed when the fitness indices have achieved the required level suggested by prior researchers. The pool CFA was applied, and fitness indices were checked and achieved the required level after deleting the items that had a low factor loading (e.g., SI3, SI4, M5, M4, FC4). The results of pooled CFA are shown in Figure 2.



Figure 2. Pooled CFA

According to Awang (2015), the construct validity is achieved when the model fitness has achieved the required level provided by previous researchers. The results of the model fitness in Table 2 shows that the values of the fitness model met the required level, meaning that the construct validity had been achieved.

Table	2.	Model	fitness
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Name of category	Name of	Index	Level of	Decision
	index	value	acceptance	
Absolute fit	RMSEA	0.073	< 0.08	Achieved the required level
	CFI	.915	> 0.90	Achieved the required level
Incremental fit	TLI	.902	> 0.90	Achieved the required level
	IFI	.916	> 0.90	Achieved the required level
Parsimonious fit	Chisq/df	2.261	< 3.0	Achieved the required level

The convergent and discriminant need to be assessed prior to analysing the path and testing the hypothesis. The convergent validity is achieved when the average (AVE) value for all constructs exceeds 0.05 and the CR value exceeds 0.60 (Awang, 2015; Hair et al. 2010). The results of AVE and CR in Table 3 show that they achieved the required value, meaning that the convergent validity had been met.

Lastly, the discriminant validity needed to be assessed to prove that the constructs in the model were discriminant of each other. The value in bold type in Table 4 is the square root of AVE of the construct and other values refer to the correlation between constructs. The discriminant validity is met when values in BOLD are higher than other values in its column and raw (Awang, 2015). Thus, the

results shown in Table 4 means that the discriminant validity of all constructs in the model has been achieved.

	CR	AVE
BI	0.965	0.847
PE	0.902	0.650
EE	0.876	0.588
SI	0.867	0.766
FC	0.777	0.546
Μ	0.812	0.592
AU	0.835	0.521

Table 3. CR and AVE values

Table 4. Discriminant validity index summary for constructs

	BI	PE	EE	SI	FC	Μ	AU
BI	0.921						
PE	0.750	0.807					
EE	0.689	0.755	0.877				
SI	0.482	0.575	0.460	0.875			
FC	0.512	0.537	0.824	0.450	0.831		
Μ	0.461	0.500	0.628	0.292	0.618	0.770	
AU	0.735	0.757	0.830	0.501	0.707	0.546	0.847

STRUCTURAL EQUATION MODELLING (SEM)

SEM - Standardized estimate

Structural Equation Modelling produces two types of output: standardized and unstandardized regression weight. Standardized estimate is used for checking the beta coefficient between constructs, R2 and factor loading for the items in the meant constructs. The unstandardized regression weight, which is known as the beta estimate, is necessary for computing the critical ratio for testing the hypothesis. The standardized estimate of the model was run first, and results are shown in Figure 3.

The R2, as is shown in the actual use construct, is 0.55, which means that 55.0% of the actual use construct is explained by the behaviour intention construct. The R2 of the behaviour intention construct is 0.61, which means that 61.0% of the behaviour intention construct is explained by the exogenous constructs PE, EE, SI, FC and mobility. These results demonstrate that this proposed model has a high explanatory power for teachers' behaviour intention toward the use of virtual classrooms. Falk and Miller (1992) pointed out that the R2 value should be greater or equal to 0.10 for the variance explained in the endogenous construct to consider the model as adequate. Cohen (1988) also mentioned that an R2 value 0.12 or less refers to a low explanatory power, 0.13 to 0.25 meaning a medium explanatory power, while values above indicate a high explanatory power of the model. Based on the literature, the R2 of this model is at 0.55, which means that this proposed model has a high explanatory power in explaining the use of virtual classrooms.



Figure 3. Standardized estimate

SEM - unstandardized estimate

The unstandardized estimate of the model is necessary to unstandardize the regression weight – beta estimate – and for computing the critical ratio for testing the hypothesis. The unstandardized estimate of the model is presented in Figure 4. Table 5 shows the regression weights between constructs in the model.



Figure 4. Unstandardized estimate

			Estimate	S.E.	C.R.	Р	Result
Performance Expectancy	-	Behavioural Intention	.473	.096	4.914	***	Significant
Effort Expectancy	-	Behavioural Intention	.286	.143	2.004	.045	Significant
Social Influence	-	Behavioural Intention	.079	.065	1.211	.226	Not Significant
Facilitating Conditions	-	Behavioural Intention	093	.218	425	.671	Not Significant
Mobility	-	Behavioural Intention	.055	.100	.549	.583	Not Significant
Behavioural Intention	-	Actual Use	.443	.050	8.889	***	Significant

Table 5. Regression weights

RESULTS OF HYPOTHESIS TESTING

The results showed that PE, EE factors have significant effect on BI ($\beta = 0.473$, p < 0.05), ($\beta = 0.286 \text{ p} < 0.05$) and BI has an effect on AU ($\beta = 0.443$, p < 0.05). Thus, this supports H1, H2 and H6. However, the effect of SI, FC and Mobility on BI was not supported ($\beta = .079$, p > 0.05), ($\beta = .093$, p > 0.05), ($\beta = .055$, p > 0.05). Hence, H3, H4 and H5 were rejected. Table 6 shows the results of hypothesis testing.

Hypothesis	Results
H1: Performance Expectancy has a significant impact on Behavioural Intention	Supported
H2: Effort Expectancy has a significant impact on Behavioural Intention	Supported
H3: Social Influence has a significant impact on Behavioural Intention	Not Supported
H4: Facilitating Conditions has a significant im- pact on Behavioural Intention	Not Supported
H5: Mobility has a significant impact on Behavioural Intention	Not Supported
H6: Behavioural Intention has a significant impact on Actual Use	Supported

DISCUSSION AND IMPLICATIONS

This research used and modified the Unified Theory of Acceptance and Use of Technology (UTAUT) model for determining the factors that may influence the use of virtual classrooms. The findings show that Performance Expectancy (PE) and Effort Expectancy (EE) were significant factors that determined teaching staff behaviour intention to use virtual classrooms. On other hand, So-

cial Influence (SI), Facilitating Condition (FC) and Mobility (M) had an insignificant effect on teaching staff behaviour intention toward the usage of virtual classrooms. The UTAUT model was extended to include a mobility construct to examine its influence on teaching staff behaviour intention among with the original constructs in the model.

The findings have illustrated that PE had a significant effect on teaching staff behavioural intention. The relationships between PE and BI were shown to be the strongest among other constructs that have a relationship with BI (B=0.51). The findings of this research are consistent with most previous studies, such as the original study of Venkatesh et al. (2003) and other studies (Ong et al., 2004; Sultana, 2020). The findings of this study also contradict some other previous studies that found an insignificant effect of PE on BI (Marchewka et al., 2007; Šumak et al., 2010). The study results imply that when teaching staff perceive the performance (usefulness) of virtual classrooms, then that will build an intention toward the use of it and they will then use it as part of their teaching method. These results are also in line with a recent study by Alotaibi (2017) where half of his study sample regarded PE as the determinant, which has the most influential effect on students' acceptance of learning management systems in the Saudi context.

The findings have also revealed that EE was a significant determinant factor for the teaching staff behaviour intention toward the use of virtual classrooms. The findings are in line with most previous studies (Abu-Al-Aish & Love, 2013; Sultana, 2020; Venkatesh et al., 2003). Thus, it could be argued that EE is considered as a crucial predictor on the behaviour intention toward the use of virtual classrooms. It should also be noted that there are previous studies that contradict the current finding as they revealed there was no relationship between EE and BI (Alshehri et al., 2019; Chen, 2011; Šumak et al., 2010; Taiwo & Downe, 2013). Nonetheless, in a study of the original study by Venkatesh et al. (2003) who developed the UTAUT model, the finding of this study confirmed the same result of the original Venkatesh et al. (2003) study, which showed that that EE was a significant predictor of BI toward the usage of technology.

The findings of this study have demonstrated that SI was an insignificant factor for teaching staff behaviour intention toward the use of virtual classrooms. The findings of this study are also consistent with other previous studies (Buabeng-Andoh & Baah, 2019; El-Masri & Tarhini 2017; Sultana, 2020). However, these finding contradict those of Venkatesh et al. (2003) and other studies (i.e., Raman et al., 2014; Wu et al., 2008) who found there was a significant influence of SI on BI. Venkatesh et al. (2003) claimed that if PE and EE were significant, which is the case in this study, FC and SI could be deemed to be insignificant. Another explanation of these finding might be because few items were utilised for measuring the SI constructs and only two items remained after running CFA, which measured the SI construct. Thus, further studies with more items that could measure the SI construct might be needed. It might also be that teaching staff put less intention to any other opinion as they may have had a great experience regarding the performance (usefulness) and effort (ease of use) relating to virtual classrooms.

The finding also revealed that Facilitating Condition and Mobility were insignificant predicators of behaviour intention toward the use of virtual classrooms. These findings contradict with certain previous studies (Mallat et al., 2008; Venkatesh et al., 2003; Wu et al., 2008). Venkatesh et al. (2003) anticipated that if the relationships of PE and EE with BI exist, then FC becomes insignificant in predicating the behaviour intention toward the use of technology. The findings of this study were also consistent with certain previous studies where they found insignificant influence of FC on BI (Alshehri et al., 2019; Sultana, 2020). A possible explanation for these findings is that nowadays teaching staff can deal with and access technology from anywhere, at any time, without a need for FC, and they pay more attention toward the performance (usefulness of technology) and effort expectancy (ease of use of technology). Thus, FC has no influence on their behaviour intention toward the use of virtual classrooms. Regarding the insignificant finding of Mobility on BI, based on the descriptive results of this study, most teaching staff use a laptop instead of mobile devices. Thus, they

might not pay much attention toward the advantage of using mobility in providing a teaching process from anywhere and at any time, which leads to finding an insignificant influence of MOB on BI.

Our findings have shown that behaviour intention has had a significant positive effect on the actual use of virtual classrooms. This finding is consistent with most previous studies which produced similar results (Alshehri et al., 2019; Lewis et al., 2013; Šumak et al., 2010; Sultana, 2020; Vankatesh et al., 2003). The findings have implied that when teaching staff have an intention to use virtual classrooms for teaching, this intention will lead to the actual use of virtual classrooms.

It should be noted that even though the UTAUT model works very well in a specific culture or context, such as the USA, and all relationships between its constructs exists (Teo et al., 2008; Vankatesh et al., 2003; Venkatesh et al., 2012), this may be not the case in other countries or contexts which have different personal and psychological chrematistics and cultural influences. Furthermore, the majority of UTAUT models have not been tested in the Arabic context (Alalwan et al., 2015; El-Masri & Tarhini, 2017).

IMPLICATIONS

The study findings have a theoretical, methodological, and practical benefit in the area of virtual classrooms. In terms of its theoretical contribution, this research has enriched the literature on virtual classrooms. Most of previous studies used the basic UTAUT model or other models for different technology, such as LMS, Mobile Cloud Learning and social websites. Few studies have focused on virtual classrooms and, based on the best knowledge of the researcher, this study is the first that has extended and modified the UTAUT model by adding an external factor (mobility) with virtual classrooms technology. Thus, it contributes theoretically to IS acceptance literature in general, and to UTAUT models specifically.

In terms of methodological contribution, this study has assessed all latent constructs in the model in a different context (Saudi Arabia), and tested them through an advanced analysis technique, which some call a second-generation multivariate, by applying a two-step rule in AMOS (CFA and SEM). The CFA has shown solid results that can measure all constructs in the model after deleting a few items that show a low factor loading to the construct. According to Awang (2015), examining the construct, convergent and discriminant validities are essential during the CFA before moving on a step and analysing data using SEM. Thus, this study has validated all constructs and its items using CFA which can be further used in a different culture, specifically in the Arab culture, such as Saudi Arabia.

This research has also made a practical contribution. The findings of this study showed which factors can determine the use of virtual classrooms. Decision makers and university organisations and administration can improve their virtual classrooms services based on the factors that determine their use. Taking care of that will lead to an increase use of virtual classrooms and lead to a successful use of virtual classrooms, which will result in huge benefits of applying virtual classrooms in the teaching process.

LIMITATION AND FUTURE RESEARCH

This research is not a free of limitation. First of all, the moderation variables of UTAUT such as age, gender and experience have not been examined in this study. This is due to the experiences of teaching staff being similar to the sample taken from one university which moved their teaching way from face-to-face to e-learning through virtual classrooms during the COVID-19 pandemic. Several studies have eliminated UTAUT moderation variables during the analysis of their data (Alalwan et al., 2015; El-Masri & Tarhini 2017; Morosan & DeFranco, 2016; Oechslein et al., 2014; Raman & Don, 2013). Future studies could examine the moderation variables to establish their impact. Secondly, this study relied on only on a purely quantitative design study. Future research might employ a mixed method

using both quantitative and qualitative designs to apply an interview after the quantitative study for getting a better insight and deeper knowledge and confirming the quantitative results.

CONCLUSION

This study aimed at examining the factors that might determine the use of virtual classrooms among teaching staff. It has extended the UTAUT model to include the mobility construct. The empirical findings showed that PE and EE had a significant positive effect on teaching staff behaviour intention toward the use of virtual classrooms while, interestingly, SI, FC and mobility had an insignificant effect on behaviour intention toward the use of virtual classrooms. The study outcome has contributed theoretically, methodologically, and practically. It will assist decision-makers, designers, organization management of virtual classrooms with the needed knowledge about which factors could play a big role in influencing the behaviour intention toward the use of virtual classrooms. Understanding the factors that influence the use of technology is essential and leads to an increase of use and a successful implementation which results in huge benefits of these technologies.

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