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DOES ANXIETY IMPEDE VLE ADOPTION INTENTIONS OF STATE UNIVERSITY LECTURERS? - A STUDY BASED ON MODIFIED UTAUT FRAMEWORK

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Abstract:
Purpose of this study is to gain a deeper understanding of technology adoption in higher educational contexts. More precisely, this study would examine the significance of technology anxiety within the UTAUT framework in determining VLE adoption intentions of non-users from the perspective of Sri Lankan state university lecturers. A developing country like Sri Lanka can potentially expand higher education sector potentials through ICT integration in the state universities. Thus, a better understanding of university staff attitudes and perceptions about educational technologies such as VLEs is essential for effective use of these technologies which intern offer prolific payoffs. Quantitative methodology was used for primary data collection. QuestionPro online survey tool was employed to send out questionnaires of which returned with 219 valid responses. A unit of the sample was a university lecturer who fit to survey criteria of Non-VLE usage. SPSS and AMOS software was used to analyze data in terms of descriptive and hypotheses testing using structured equation modelling. By adding the technology anxiety as an external component (i.e., affection) to UTAUT factors (mainly cognitive and behavioral), this study enhanced the response power of the framework in determining adoption intention of non-users in the study context. Further, the theorized relationships between UTAUT factors and technology anxiety would fulfil the gap in the lack of literature that connects affective, cognitive components to predict technology adoption in the presence of demographics such as lecturer's age and gender. Results of the study reveal that performance expectancy, facilitating conditions, has a positive correlation with VLE adoption intention, while technology anxiety confirms its significant negative effect on the same. Further, it was found that technology anxiety has positive effects on both performance expectancy and effort expectancy although one variable (PE) indicate a mediation effect. However, the

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effect of technology anxiety on all hypothesized relationships was moderated by lecturer's age and gender.

Keywords: Unified Theory of Acceptance and Use of Technology (UTAUT), Virtual Learning Environment (VLE), anxiety, blended learning, teacher technology acceptance, Structured Equation Modelling (SEM), mediation, moderation, Sri Lanka

1. Introduction

"*Technology is of little value unless it is accepted and used*" (Samaradiwakara & Gunawardena, 2014). Consequently, it is imperative to explore avenues of promoting technology adoption and understand what hinders user acceptance of technologies, before making recommendations to practitioners.

Rapid growth in ICT and related technology has escalated the development of education technology, creating global trends and modern approaches to education delivery. (Palvia et al., 2018). Most developed nations (i.e. USA, UK, Canada, Australia) have already integrated these IT/technology advancements into their educational systems (Nair, Ali, & Leong, 2015), opening various new avenues to teaching and learning (i.e. e-learning) that are made possible through internet-based communication platforms such as virtual learning environments (VLE) (Parsons, 2017).

High global prominence earned by online education has created high interest among researchers in studying the dynamics of modern educational systems such as VLEs. As a result, many studies have already flourished embodying VLE adoption and its peripherals in various social, cultural and theoretical perspectives. However, information system (IS) acceptance theories such as TAM, UTAUT have shown its potential to reach new knowledge horizons in this phenomenon. Although certain studies have already validated the applicability of IS theories in VLE acceptance, scanty of research was found to prove their use to predict non-user's adoption intentions to VLE, especially from state university lecturer's perspective where blended learning is practiced.

UTAUT advocates namely, Venkatesh, Thong, and Xu (2016) have recommended systematic extensions to the model to improve its efficiency in examining different paradigms and concepts of research interests. Emotions such as anxiety is an extremely relevant concept in technology acceptance especially in contexts where the use of technology is voluntary (Khechine & Lakhal, 2018). By adding anxiety or technology anxiety as appropriated for this study; will enhance UTAUT response to this research problem since affective focus (lack in the original model) is brought in to the UTAUT framework.

Accordingly, this research is aimed at exploring the role of technology anxiety within UTAUT in understanding non-user adoption intentions to VLEs from the perspective of Sri Lankan state university lecturers. For this purpose, the following research questions will be answered:

1) Does technology anxiety play a significant role in determining non-user's adoption intentions to VLE?
2) What UTAUT constructs are significant in predicting VLE adoption intentions of non-users?
3) Does the relationship between technology anxiety and behavioral intention is mediated by performance or effort expectancy?
4) Do UTAUT moderators such as lecturers' age and gender show salience in anxiety to intention relationship?
5) Does technology anxiety have any effect on performance expectancy or effort expectancy?

Sri Lanka is a developing country aimed to expand opportunities to higher education through ICT integration in the state university sector (Wickramasinghe, 2018). Therefore, it is believed that this study would provide significant theoretical, methodological and practical contributions to the administrators and practitioners in higher educational institutions in the developing nations.

2. Literature Review

This study aims to explore VLE adoption intentions of state university lecturers who are currently non-users. The underlying theory of this study is the UTAUT framework, which would be extended appropriately to answer research questions. VLE is a software tool that allows interactions between teachers and students (BECTA, 2003). In this section, the literature related to the aspects of VLE usage in a voluntary setting; overview of UTAUT model; introduction to technology anxiety and role of technology anxiety in teachers' technology acceptance and so on will be discussed.

2.1 Use of Virtual Learning Environments in a voluntary setting

The rapid growth of ICT and trends in the global economy have made higher educational institutes to invest in virtual learning platforms also called as virtual learning environments (VLE), Learning management systems (LMS), or more commonly e-learning systems. VLEs offer convenience and efficiency in the delivery of educational instructions. Apart from this, VLEs offer many benefits (i.e. course management, data repository, communication, evaluation and so on) to its users (Joint Information Systems Committee, 2009).

In local state universities, voluntary use of VLE is promoted (at the discretion of lecturers); thus, blended learning is practiced. As indicated by Colis and Moonen (2001), blended learning provides flexibility to blend technology with traditional teaching in course designing and delivery. Therefore, under blended learning practice, flexibility and convenience are offered to both teachers and students.

In a voluntary usage setup, effective utilization of software system relies upon the lectures' dispositions towards the computers and technology (Lawton & Gerschner,

1982). This was verified by Koohang (1989) stating that Lecturer's skills, knowledge, perceptions, and attitudes significantly affect adoption intentions of a technology.

2.2 UTAUT Theory for technology acceptance

In the past few decades, a countless number of theories were designed to examine the individual behaviours that affect acceptance of technological innovations. The unified theory of acceptance and use of technology (UTAUT) by Venkatesh, Morris, Davis, and Davis (2003) stands out among the rest as a model that has high predictability and has been well recognized in the field of IS acceptance literature. The UTAUT model is a progressive extension of eight well established IS acceptance theories such as the "theory of resend action (TRA)", technology acceptance model (TAM), the theory of planned behavior (TPB), the innovation diffusion theory (IDT), the model of PC use, the motivational theory, TAM- TRA combined model and also the social cognitive theory (SCT). Therefore, the UTAUT theoretically includes the collective investigative power of all these theories.

The UTAUT introduces four (4) predictors of technology acceptance, namely, Performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC) that determine intention to use, which then mediates between those determinants and use behavior. Further, UTAUT introduces a construct called 'individual differences' encircling four variables namely, gender, age, voluntariness and experience, as moderators of the relations between independent variables and behavioral intention. Furthermore, UTAUT recognizes facilitating conditions (FC) as a direct determinant of actual use identifying two predictors of use behavior. Moreover, UTAUT has claimed over 70% predictive power of technology acceptance in multiple research settings. The high significance of the model is verified in multiple studies of teacher's technology acceptance across different cultures (Demissie, 2011; Raman et al., 2014; Tibenderana & Ogao, 2008; Wong, Teo, & Russo, 2013). However, review of recent studies of teacher's technology acceptance indicates that the UTAUT has reached its bounds in this domain and a need has arisen for extensions with new constructs.

During the literature review, various UTAUT extensions (variables) were found. For *instance*, personal traits (Barnett, Pearson, Pearson, & Kellermanns, 2015), ICT competency (Aslan & Zhu, 2018), attitude (Dwivedi, Rana, Jeyaraj, Clement, & Williams, 2017), anxiety (Maican, Cazan, Lixandroiu, & Dovleac, 2019); self-efficacy (Long, Cummins, & Waugh, 2018), experience (Dedeoglu, Bilgihan, Ye, Buonincontri, & Okumus, 2018) were the commonly used UTAUT extensions. For this study, an affective (emotional) component (anxiety) will be added to existing UTAUT framework, expecting to alter its relationships while enhancing generalizability.

2.3 Role of Anxiety in determining adoption intention

Bandura (1986) explained anxiety as a negative emotional reaction that creates an adverse effect against person's intention to perform a particular task. Compeau,

Higgins, and Huff (1999) identified anxiety as a significant barrier to IT acceptance. The concept of anxiety is discussed under two headings; trait anxiety and state anxiety (Igbaria & Chakrabarti, 1990). Trait anxiety refers to a relatively stable personality trait (character) of an individual that trigger adverse reactions when faced with external stimuli. State anxiety is brief emotional distress felt by an individual when faced with an external stimulus (Saadé & Kira, 2006). Russell and Bradley (1997) suggest a further classification of state anxiety as, task anxiety (fear of not able to complete a task), damage anxiety (fear of damage/lose valuable thing) and social anxiety (fear of unexpected social exposure).

In this study, we attempt to understand the effect of task anxiety; that is described above as a temporary uneasy feeling or worry of an individual having to deal with computers or systems. VLE is not a simple application, but a complicated software platform, that needs multiple skills (Hardware/software skills) for effective interaction.

Empirical evidence suggests that anxiety has a direct negative effect on adoption intention (Holzmann, Schwarz, & Audretsch, 2018; Huang, 2017; Maican et al., 2019) while some other studies confirm its significance in predicting use behavior (Khechine & Lakhal, 2018).

Additionally, anxiety is found to be negatively influencing individual's performance expectations allied with technology use (Celik, 2016). Similarly, anxiety hurts perceived effort to complete a task using a particular technology (Abdullah, Ward, & Ahmed, 2016; Celik, 2016; Peng, 2019). Thus, negative thoughts such as worry, fear, uneasiness would trigger physical withdrawal (non-usage) or mental withdrawal (engage in nonproductive tasks irrelevant to perform the job) which impede task performance (Smith & Caputi, 2001).

Review of the literature suggests that demographics such as age and gender could influence the effect of anxiety on one's behavioral intention to use computers and technologies. Precisely, elders are more anxious in dealing with technology (Celik, 2016). Similarly, women have displayed a high level of anxiety in their technology dealings (Celik, 2016) while; younger men have exhibited more interest in exploring new technologies (He & Freeman, 2010). Literature also suggests that feeling of anxiety get diminished over time, especially with increased experience (Venkatesh et al., 2003).

3. Theoretical Framework and Hypotheses

The theoretical basis of deriving the hypotheses is presented in the following section. The UTAUT model is used as the theoretical backbone of this study. UTAUT framework gained its popularity in examining technology acceptance since its launch in the early 2000s. However, a review of the literature suggests that UTAUT has been predominantly employed in studies to discuss technology Use (User Perspective) and non-user perspective have mainly been missed out. However, to test the robustness of a model, it should be tested in various cultures, contexts, considering different perspectives to technology adoption (Khechine & Lakhal, 2018). Thus, this research

aims to address this theoretical gap in knowledge by examining the VLE (technology) adoption intention of state university lecturers in Sri Lanka. Since blended learning is practiced in state universities, VLE is used voluntarily. Thus, VLE uptake has been recorded poor across all state universities in the country (Nanayakkara, 2017; Nanayakkara & Kusumsiri, 2013). Therefore, the non-user perspective was found to be a refreshing notion for the research. The UTAUT framework was extended by adding the variable "technology anxiety", which seemed appropriate for the context of this study.

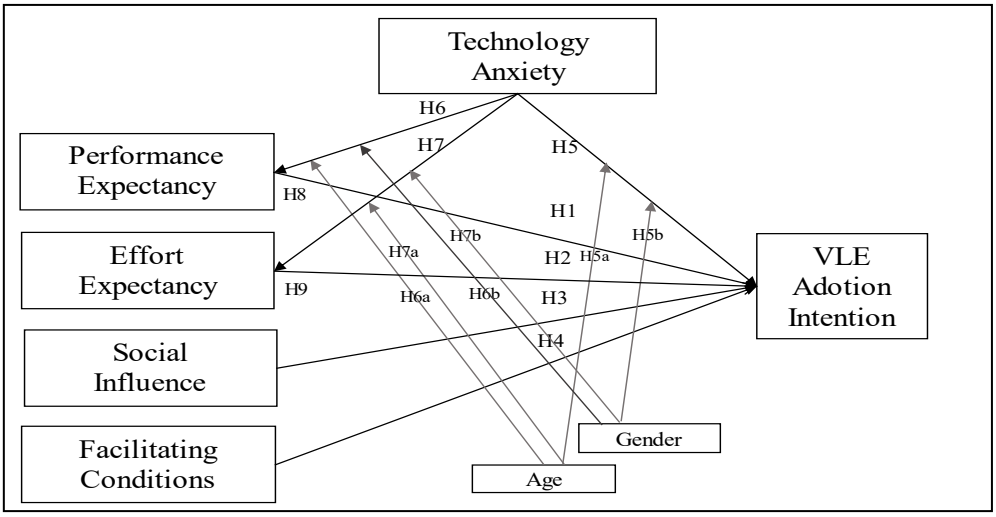

Figure 1: The research hypotheses

Study variables and proposed hypotheses are defined below.

3.2 Performance expectancy (PE)

PE refers to a particular individual's perception of how he or she is benefited from using the VLE software system (Venkatesh et al., 2003). According to original UTAUT study findings, PE is the strongest predictor of behavioral intention (BI), and its significance has been empirically verified in the context of academics' technology acceptance (Althuizen, 2018; El-Masri & Tarhini, 2017; Maican et al., 2019; Uğur & Turan, 2018). Further, VLEs provide benefits such as time-saving, convenience, data repository and so on. Thus, it is hypothesized that;

HI: performance expectancy (PE) has a direct positive influence on behavioral intention to use VLE

3.2 Effort expectancy (EE)

EE refers to a particular individual's perception of the ease of using the VLE system (Venkatesh et al., 2003). EE was a significant determinant of BI according to original UTAUT study findings (Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012). Many other studies have confirmed the significance of EE in academics' acceptance of technology (Althuizen, 2018; El-Masri & Tarhini, 2017; Maican et al., 2019), although it has been insignificant in the presence of certain conditions (Sumak, Polancic, &

Hericko, 2010; Uğur & Turan, 2018) VLE is likely to be perceived as easy to use, due to flexible features, familiarity and so on. Therefore, we hypothesize that;

H2: effort expectancy (EE) has a direct positive influence on behavioral intention to use VLE.

3.3 Social influence (SI)

SI refers to the extent to which a person believes that people important to him/her wanting to use the VLE system (Venkatesh et al., 2003). It is believed that individuals behave in specific ways to maintain a social image in front of their important others. Significance of SI in academics' technology adoption has been confirmed in many studies (Althuizen, 2018; El-Masri & Tarhini, 2017; Nandwani & Khan, 2016). However, some others studies failed to verify the significance of social influence on teachers technology acceptance (Maican et al., 2019; Teo, Milutinović, & Zhou, 2016) Based on these findings we hypothesize that;

H3: Social Influence (SI) has a direct positive influence on behavioral intention to use VLE.

3.4 Facilitating conditions (FC)

FC refers to an individual's perception of the support and infrastructure facilities available to him to use the VLE system (Venkatesh et al., 2003). In original UTAUT findings, FC to BI relationship was not verified. However, it was proven in UTAUT2 by Venkatesh et al. (2012) and confirmed by many other studies (El-Masri & Tarhini, 2017; Holzmann et al., 2018; Maican et al., 2019). Further, Gamage and Fernando (2012) stated that, all state universities in the country are equipped with network and infrastructure to facilitate eLearning. Therefore, we hypothesize that;

H4: Facilitating Conditions (FC) has a direct positive influence on behavioral intention to use VLE.

3.5 Technology Anxiety (AX)

AX refers to the feeling of uneasiness or anxiousness that individuals deal with when faced with computers or technologies. (Saadé & Kira, 2009). Although AX was included in the evaluation phase of UTAUT, its significance was not proven. However, the significance of AX on teacher's accepting technology has been highlighted by many types of research (Holzmann et al., 2018; Huang, 2017; Maican et al., 2019).

The long-standing debate about the association between Anxiety and technology acceptance has brought to light in the recent IS acceptance studies. Further, many scholars including Venkatesh et al. (2003) has recognized the significance of anxiety in determining an individual's response to new technologies. Thus, the variable "technology anxiety" is proposed as a determinant of lecturer's VLE adoption intention.

This study aims to test the hindering effect of technology anxiety on lecturer's beliefs namely, performance expectancy (Celik, 2016) and effort expectancy (Abdullah et al., 2016; Celik, 2016; Peng, 2019). Therefore, the following hypotheses are proposed;

H5: Technology Anxiety (AX) has a direct negative influence on behavioral intention to use VLE.

H6: Technology Anxiety (AX) has a direct negative influence on Performance Expectancy.

H7: Technology Anxiety (AX) has a direct negative influence on Effort Expectancy.

Additionally, mediation effects of UTAUT constructs (PE and EE) on the relationship between AX to BI are hypothesized as follows,

H8: Performance Expectancy mediates the relationship between Technology Anxiety (AX) and Behavioral Intention (BI).

H9: Effort Expectancy (EE) mediate the relationship between Technology Anxiety (AX) and Behavioral Intention (BI)

3.5 Behavioral intention to use (BI)

BI refers to an individual's willingness to use the VLE system (Venkatesh et al., 2003). In technology acceptance models, BI is considered as the first sign of adoption, often determine the use behavior short after.

3.6 Use behavior (USE)

USE refers to self-reported frequency of use of the VLE system. The scope of this study is limited to non-user's adoption intentions. Therefore, use behavior will not be predicted.

3.7 Age and Gender

Demographics of the respondents are captured since it is in scope to understand the relationship between respondents' demographics and anxiety. The moderating effect of age and gender is emphasized in the original UTAUT model. According to Venkatesh et al. (2003), both age and gender affect all UTAUT predictors (PE, EE, SI, FC) varying their significance on BI. Therefore, the scope of this study is limited to testing the possibilities regarding the moderating effect of age and gender on technology anxiety only.

Thus, the moderating effect of age and gender on technology anxiety is hypothesized as follows:

H5a: Lecturer's age moderates the effect of technology anxiety (AX) on BI

H5b: Lecturer's gender moderates the effect of technology anxiety (AX) on BI

H6a: Lecturer's age moderates the effect of technology anxiety (AX) on PE

H6b: Lecturer's gender moderates the effect of technology anxiety (AX) on PE

H7a: Lecturer's age moderates the effect of technology anxiety (AX) on EE

H7b: Lecturer's gender moderates the effect of technology anxiety (AX) on EE

Two other moderating variables exist in the original UTAUT model, namely voluntariness and experience. However;

- Voluntariness: Voluntary usage of VLE is practiced across all universities; therefore, this variable is not relevant for this study.
- Experience: Non-users are the focus of this study. Therefore, this variable is not relevant to the study context.

4. Methodology

In order to explore VLE adoption intentions of state university lecturers, suitable research design and methodology was researched through literature. The quantitative methodology was the dominant method used in most IS researchers. Further, its inherited benefits such as ease of quantifying responses of a large sample, high generalisability of results and so on, inspired the researcher to faour this methodology. Accordingly, a cross-sectional study was designed using the deductive approach and quantitative methodology that was to employ in a non-contrived setting, as it appeared to be the most suitable technique to test hypotheses and answer the research questions set in this study.

The Unified Theory of Acceptance and use of Technology Model (UTAUT) was used as the theoretical foundation for this study that was extended with the variable "technology anxiety" in determining factors triggering low usage of VLE in the local universities despite the facilities and support provided. UTAUT is a theory that is validated in different contexts and different periods (El-Masri & Tarhini, 2017; Oshlyansky, Cairns, & Thimbleby, 2007); thus, its measurement tool was considered to be appropriate for this research. However, certain words and phrases of measurement items were changed to suit the current context of the study.

The measurement Instrument entailed two sections, the first section covered respondents' profile and demographics (i.e. age, gender and so on), while the second segment was designed to capture respondents' perceptions about VLEs in the university environment. To operationalize the questionnaire original UTAUT scale, (Venkatesh et al., 2003) and measures of technology anxiety scale (Saadé & Kira, 2009) was employed. The questionnaire included five independent constructs (PE, EE, SI, FC, AX) measuring behavioral intention (BI) towards VLE adoption (USE) which included 29 items listed in a Seven-point (1-7) Likert scale.

The questionnaire was pre-tested with 30 known lecturers who were non-users of VLE. Upon their feedback survey instrument was modified with changed words and phrases, added definitions of technical terms and so on, improving clarity, validity and reliability. The final questionnaire was created using the *QuestionPro online survey* tool. Thereafter, the instrument was pilot tested with a randomly selected sample of 150 state university lecturers of which 64 respondents confirmed they are non-users leaving 53 valid responses to test the reliability of scale items. All constructs displayed Cronbach alpha above the stipulated level ($\alpha > 0.7$) indicating the reliability of questionnaire items to proceed with actual data collection (Sekaran & Bougie, 2016).

The sample framework was established using UGC (University Grant Commission) records and university web sites. The survey population was totaled to # 5669 permanent state university lecturers registered across 15 state universities, and 21 affiliated institutes (University Grants Commission Sri Lanka, 2017) Simple random sampling method was employed for sample selection.

Consequently, for the primary study, # 1500 online questionnaires created in *QuestionPro survey tool* were distributed through a mailer list expecting about 35% respond rate (Baruch & Holtom, 2008). #643 questionnaires were returned affirming a 43% response rate. However, only # 269 responses met the selection criteria of this research which is being aware of VLE but a non-user. (Respondents were asked about VLE awareness and to mark current usage; those respondents who knew about VLE but non-users were selected for statistical inferences). # 38 of selected questionnaires were incomplete with a chunk of missing data. Therefore, they were discarded. Multivariate outliers were detected using Mahala Nobis distance method, and #14 responses were removed from the sample (Hair Jr, Hult, Ringle, & Sarstedt, 2016). Remaining sample with # 219 records was adequate for further analysis in answering research questions.

5. Data Analysis and Results

IBM SPSS ver. 21 and AMOS ver. 18 software was used for multivariate data analysis under Structural Equation Modelling (SEM). SEM allows building linear relationships among observed variables and unobserved variables that provide the premise to test hypotheses by assessing structural paths. Series of steps were followed before assessing the structural model that was theorized for this study.

5.1 Demographics of the sample

As illustrated in table 1, the sample comprised of 51.6% female and 48.4% male which indicated a fair representation of the population (53%F:47%M). Mean age of the sample was 43.8 years. Participants ranging from 24yrs to 66yrs represented the sample. Respondents below mean age labelled as the younger group; labeling the other half as the older group. The majority (66.2%) of participants were with five years or more experience in lecturing. Nearly 50% of the sample was PhD holders. Academic ranking wise, 13% professors, 54% senior lecturers, 28% lecturers and 5% assistant lecturers composite the sample. Further, participants represented a range of academic disciplines (Science 23.3%, Arts 19.2%, medicine 18.7%, agriculture 12.8% and so on) and universities.

Table 1: Demographic profiles of respondents

Characteristic	Clasification	Count	%
Gender	Male	106	48.4
	Female	113	51.6
Age	Younger*	110	50.2
	Older*	109	49.8
Period of Service	<5 years	74	33.8
	6 -10 years	42	19.2
	11-15 years	30	13.7
	16 -20 years	22	10.0
	21-25 years	29	13.2
	>25 years	22	10.0
Academic Rank	Assistant Lecturer	11	5.0
	Lecturer	61	27.9
	Senior Lecturer	118	53.9
	Professor	29	13.2
Highest Academic Qualification	Bachelor's degree	29	13.2
	Master's Degree	57	26.0
	MPhil	26	11.9
	PhD	107	48.9
Current Computer Knowledge (Self Reporated)	Poor	2	1.0
	Moderate	32	14.6
	Good	130	59.4
	Very good	55	25.0
Usage status (Self Reporated)	Non user - aware of VLE	219	100.0

* Age group split based on the mean value

5.2 Construct Reliability and Validity

The reliability and validity tests confirm the consistency and accuracy of the measure of each construct. In this study, reliability was tested through Cronbach Alpha (α) and composite reliability for the value above of 0.70 for internal consistency among the items of measurement scale (Hair Jr et al., 2016). Values of Cronbach Alpha (α) ranged from 0.7 to 0.94. Similarly, Composite reliability (CR) values exceeded the cutoff point of 0.5 indicating high reliability of the scale (Hair Jr et al., 2016). Results were consistent with the findings of UTAUT studies (Farooq et al., 2017; Venkatesh et al., 2003; Venkatesh et al., 2012).

The validity of the scale was assessed through convergent validity and Discriminant validity. Average Variance Extracted (AVE) was calculated for values above 0.5 to assess the convergence of item scale in each construct (Fornell & Larcker, 1981). AVE of all latent constructs was above 0.5, which confirmed high reliability and convergence of the measurement scale.

Fornell and Larcker (1981) criteria were employed to assess discriminant validity. Accordingly, the square root of AVE was compared against the inter-item correlation between constructs. As indicated in tables two (2) and three (3), construct wise reliability, convergent validity and discriminant validity was achieved.

Table 2: Reliability, Internal Consistency and Convergent Validity

Constructs and Measures		Mean	SD	Cronbach's Alpha (α)	CR	AVE
Performance Expectancy (PE)				0.878	0.879	0.594
PE 1	I would find Virtual Learning System useful in my job.	3.78	1.13			
PE 2	Virtual Learning System would enable me to accomplish my tasks more quickly.	3.68	1.09			
PE 3	Using Virtual Learning System would increase my productivity.	3.60	1.12			
PE 4	Using Virtual Learning System will increase my chances of getting a reward/benefit.	3.64	0.94			
PE 5	Using Virtual Learning System would make it easier to do my job.	3.78	1.12			
Effort Expectancy (EE)				0.924	0.926	0.759
EE1	I would find Virtual Learning System easy to use.	4.04	1.27			
EE2	Learning to operate Virtual Learning System is easy for me.	4.05	1.22			
EE3	It would be easy for me to become skillful at using the Virtual Learning System system.	4.00	1.23			
EE4	My interaction with the Virtual Learning System would be easy, clear and understandable.	4.29	1.31			
Social Influence (SI)				0.942	0.941	0.764
SI1	People who influence my behavior think I should use Virtual Learning System.	4.50	1.68			
SI2	People who are important to me think that I should use the Virtual Learning System.	4.50	1.71			
SI3	In my university, lecturers who use Virtual Learning System have more prestige than others.	3.96	1.69			
SI4	The higher administration of this university has influenced me to use Virtual Learning System.	4.28	1.77			
SI5	In general, the university policies, administration encourage me to use Virtual Learning System.	4.38	1.69			
Facilitating Conditions (FC)				0.895	0.896	0.633
FC1	I have the resources necessary to use the Virtual Learning System.	4.07	0.99			
FC2	I have the knowledge necessary to use the Virtual Learning System.	3.78	0.99			
FC3	The Virtual Learning System is compatible with other systems I use for my job.	3.83	0.92			
FC4	Technical help (specific person or group) is available for assistance.	3.79	0.97			
FC5	University has provided the release time to learn and use Virtual Learning System.	3.80	0.88			
Technology Anxiety (AX)				0.934	0.934	0.740
AX1	I feel nervous / frightened to use IT/software systems.	3.82	1.63			
AX2	It scares me to think that I could lose a lot of information in IT/software systems by accidentally hitting the wrong key.	3.97	1.65			
AX3	I hesitate to use IT/software system for fear of making mistakes I cannot correct.	4.02	1.66			
AX4	The IT/software systems are somewhat intimidating (scary) to me.	3.85	1.66			
AX5	I have difficulty in understanding the technical aspects of IT/software systems.	4.09	1.45			
Behavioral Intention to Use (BI)				0.867	0.870	0.574
BI1	I Intent to use the Virtual Learning System during this semester.	4.22	1.01			
BI2	I intend to learn to use the Virtual Learning System	4.19	0.95			
BI3	I intend to integrate Virtual Learning oppertuinty and features for my lecturers	4.16	1.01			
BI4	I predict I would use Virtual Learning System in the next semester as well	4.03	1.03			
BI5	I plan to use Virtual Learning System for my daily work	4.23	0.83			

Table 3: Discriminant Validity

Construct	Mean	SD	AVE	MSV	MaxR(H)	PE	EE	SI	FC	AX	BI
PE	3.70	0.89	0.594	0.203	0.886	**0.771**					
EE	4.09	1.14	0.759	0.105	0.943	0.133	**0.871**				
SI	4.33	1.54	0.764	0.050	0.954	0.058	0.223	**0.874**			
FC	3.85	0.80	0.633	0.133	0.900	0.215	0.202	0.096	**0.795**		
AX	3.95	1.43	0.740	0.203	0.936	-0.284	-0.324	-0.023	-0.258	**0.860**	
BI	4.17	0.78	0.574	0.203	0.874	0.450	0.202	0.020	0.365	-0.450	**0.758**

SqRoot of AVE are shown as diagonal values, inter construct correlation values are shown as off diagonal values

5.3 Exploratory Factor Analysis (EFA)

EFA is a statistical procedure used to discover underlying latent relationships among a large number of measured variables (Sekaran & Bougie, 2016). In this, each measured variable is assigned to any unique or common construct, and factor loadings corresponding to each manifested variable is extracted. Factors were extracted using Principle component analysis, and varimax rotation was employed in extracting common factors. Factor loadings were assessed for values above 0.5 to ensure the practical significance of measured variables (Hair Jr et al., 2016). As suggested by Field (2013) correlation between items were assessed for values (r) greater than 0.3 and KMO, and Bartlett's test of sphericity measure was verified for value over 0.5 as a prerequisite for this procedure Output of Factor analysis is illustrated in table 3.

Table 3: Output of Factor Analysis

Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
SI4	.925	-.004	-.011	-.001	.030	.060
SI1	.922	-.010	.039	.007	-.011	.089
SI2	.912	.000	.079	.019	-.007	.092
SI5	.895	.041	.036	.037	.012	.109
SI3	.816	-.039	.036	.045	-.009	.100
AX1	-.077	.862	-.061	-.058	-.132	-.172
AX5	.018	.860	-.091	-.049	-.155	-.056
AX4	.004	.854	-.139	-.084	-.136	-.071
AX3	.005	.853	-.107	-.130	-.184	-.115
AX2	.035	.852	-.046	-.172	-.204	-.169
FC2	.027	-.128	.866	.105	.054	.016
FC4	.020	-.043	.829	.058	.145	.105
FC1	.086	-.083	.810	.047	.021	.070
FC3	.021	-.061	.806	.074	.181	.073
FC5	.017	-.095	.784	.057	.210	.074
PE1	.071	-.083	.027	.845	.153	.068
PE3	.018	-.064	.048	.822	.159	-.055
PE2	-.001	-.050	.041	.808	.173	-.049
PE5	-.040	-.091	.040	.790	.184	.050
PE4	.070	-.163	.209	.716	.080	.117
BI5	.042	-.116	.086	.187	.805	.087
BI1	-.084	-.200	.127	.174	.779	.027
BI2	.070	-.176	.154	.130	.774	.045
BI3	-.015	-.106	.072	.155	.745	.014
BI4	-.002	-.183	.190	.137	.733	.058
EE1	.092	-.145	.062	.071	.102	.918
EE2	.113	-.135	.061	.105	.068	.893
EE3	.134	-.140	.038	.072	.056	.871
EE4	.121	-.105	.192	-.143	-.009	.834

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

5.4 Confirmatory Factor Analysis (CFA)

The reflective measurement model was created in AMOS by connecting measures to latent constructs. Next, the CFA was performed in which the goodness of fit is tested between observed variables and the hypothesized model (Hair Jr et al., 2016). Measurement model (refer to figure 1) fit was obtained in terms of absolute fit (GFI=0.873, PGFI=0.727, RMSEA=0.041, AGFI=0.848, SRMR=0.046), Incremental fit

(CFI=0.971, NFI=0.898, TLI=0.967) and parsimonious fit (CMIN = 493.18, DF = 362, χ^2/df=1.362,NPAR=73) that were within recommended cut off levels (Hair Jr et al., 2016). Further, the CFA factor loadings were significant (P<0.01) and exhibited values above the cut off of 0.7 indicating high internal consistency between items (Fornell & Larcker, 1981). Thus, the model was deemed acceptable for the study.

The reflective measurement model is presented in Figure 2.

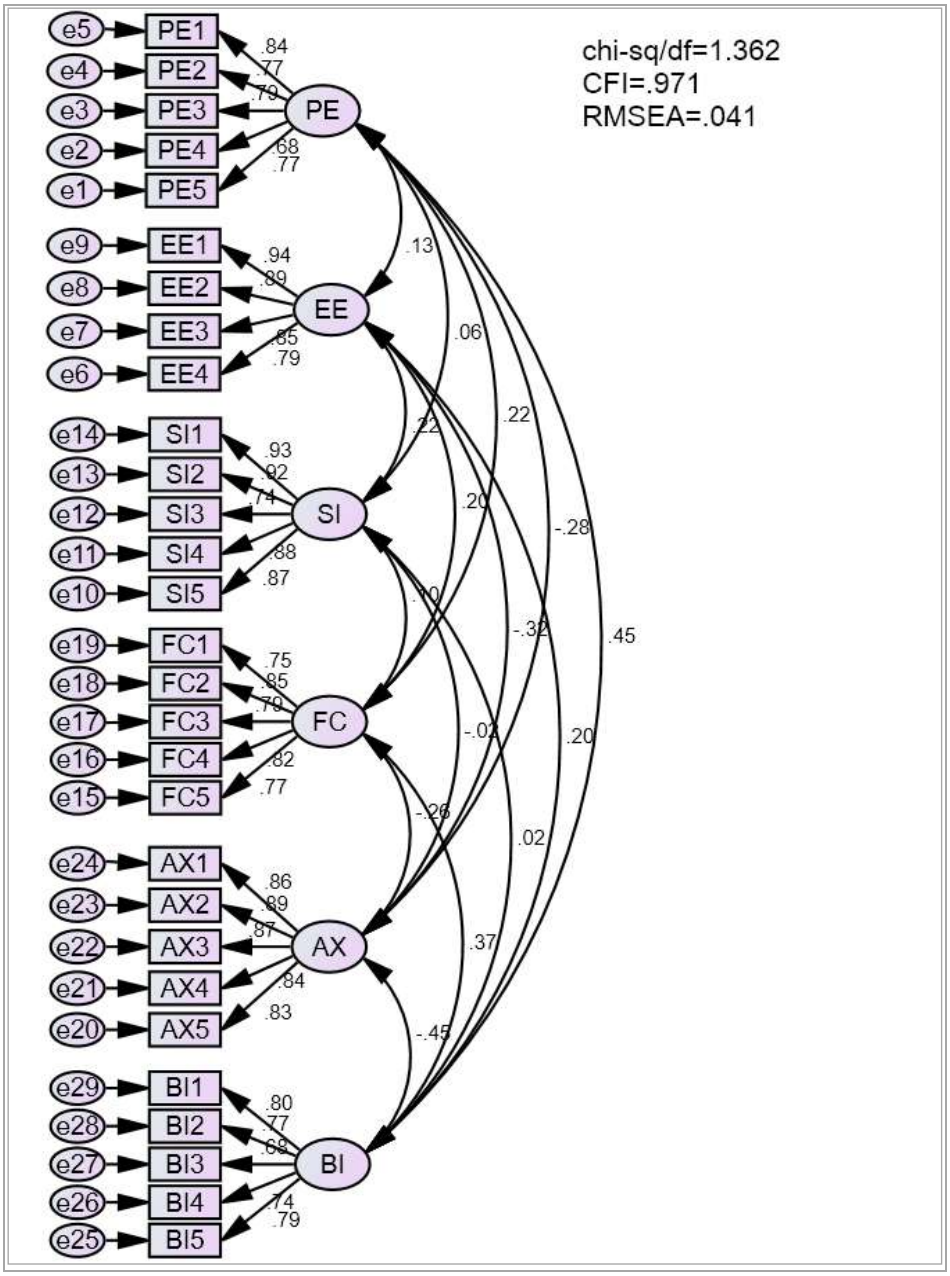

Figure 2: The Measurement Model

5.5 Structural Model Assessment

Assessment of measurement model indicated that it is suitable for further analysis of hypotheses testing. Therefore, the structural model was built in AMOS by connecting predictor variables with dependent variables through single-headed arrows.

Consequently, five predictor variables (PE, EE, SI, FC, AX) and a dependent variable (BI) were identified. Firstly, goodness of fit (GOF) indices of the model was assessed and results revealed that GOF were within the accepted level (CMIN = 510.063, df=367, $\chi^2/df=1.390$, *AGFI=0.846 PGFI=0.734, RMSEA=0.042,* CFI=0.968, TLI=0.964, NFI=0.895, SRMR=0.067) indicating the model suitability for hypotheses testing. Next, the significance of each hypothesised structural path was tested using standard path coefficients and the p-values.

The structural model of the study is shown in Figure 3.

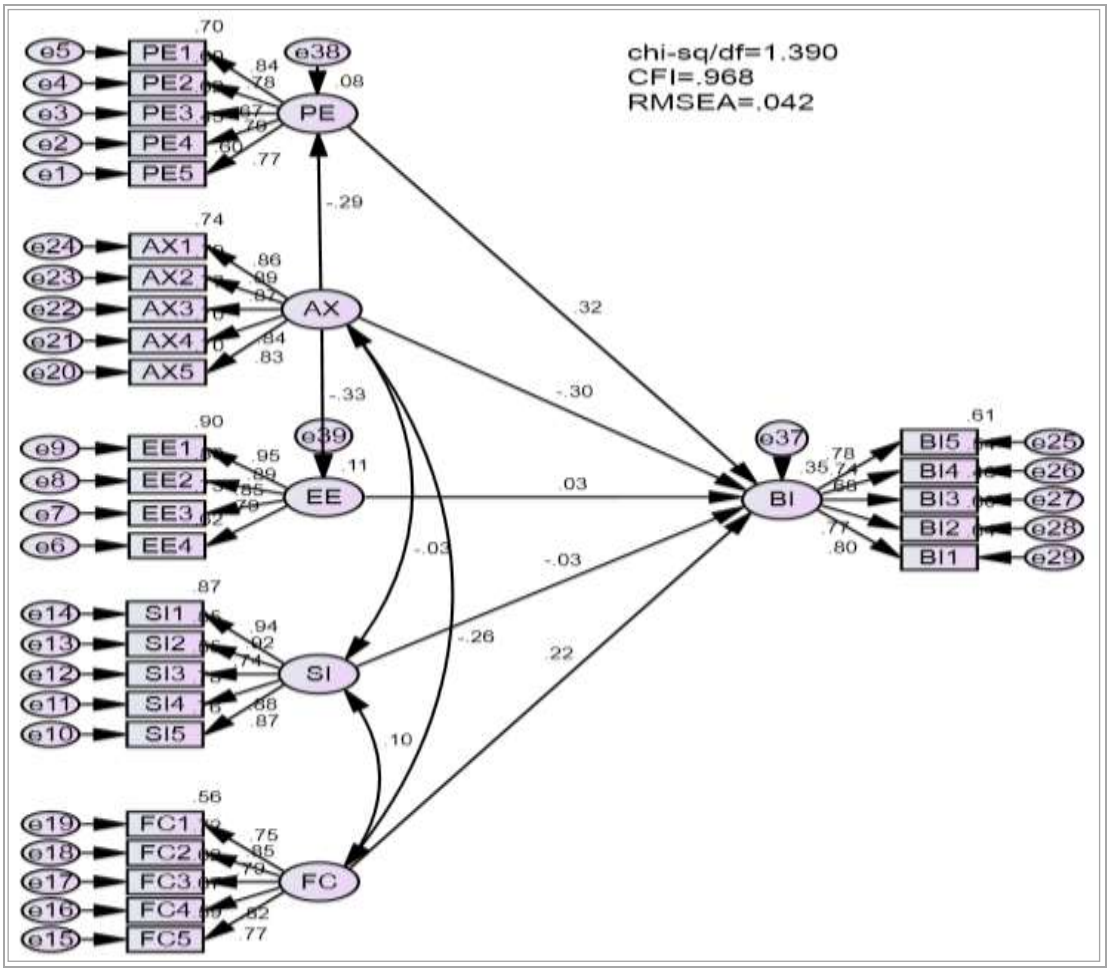

Figure 3: The Structural Model

As shown in the figure three (3) above, R^2 value for the direct relations between predictor variables (PE, EE, SI, FC, AX) and BI was 0.35 which confirmed nomological validity (R^2 value> 0.10) of the theorized model in explaining non user's VLE technology adoption intentions in the local university context (McKenna, Tuunanen, & Gardner, 2013).

Table 4 depicts the results of hypotheses testing based on structural model analysis.

Table 4: Results of hypothesized path analysis

Path (Hypothesis)	Max. Likelyhood Estimate	Standardized path coefficients (Beta)	S.E.	C.R.	p	Hypothesis test result
PE ---> BI (H1)	0.24	0.321	0.054	4.414	***	Supported
EE ---> BI (H2)	0.019	0.030	0.042	0.448	0.654	Not Supported
SI ---> BI (H3)	-0.015	-0.033	0.028	-0.529	0.597	Not Supported
FC ---> BI (H4)	0.216	0.224	0.067	3.204	0.001	Supported
AX---> BI (H5)	-0.159	-0.296	0.041	-3.9	***	Supported
AX---> PE (H6)	-0.206	-0.287	0.054	-3.846	***	Supported
AX---> EE (H7)	-0.28	-0.327	0.062	-4.528	***	Supported

Results of the path analysis revealed that five of seven hypotheses were significant (refer to table 4 above). Two UTAUT predictors namely, performance expectancy (PE); facilitating conditions (FC) indicated significant positive relationships between behavioral Intention (BI) supporting H1 and H2 respectively. The correlation between Technology Anxiety (AX) and Behavioral Intention (BI) was negative but significant, thus supported H5. Similarly, Technology Anxiety had significant adverse effects on performance expectancy (PE) and Effort Expectancy (EE) confirming H6 and H7. However, challenging UTAUT findings neither social influence nor effort expectancy was significant in predicting behavioral Intention (BI) in the current context. Thus, both H2 and H3 were rejected. The three significant direct relationships (PE, FC, AX) collectively explained 35% variability of the BI.

In order to study indirect effects of PE and EE on AX to BI relationship, bootstrapping procedure was used (Hair Jr, Babin, & Krey, 2017). Bias-corrected confidence interval at 95 levels was calculated with 2000 bootstrap samples. The effect size of the mediation was calculated using the standardized effect approach as suggested by (Mallinckrodt, Abraham, Wei, & Russell, 2006). AX had a strong negative direct effect on both PE and EE. However, a significant indirect effect was observed only in the path AX→PE→BI, reflecting partial mediation (Refer to table 5). Path AX→EE→BI had no indirect effect, indicating no mediation.

To sum up, PE partially mediated the relationship between AX and BI. Therefore, H8 was supported. EE did not mediate AX to BI relationship. Therefore, H9 was not supported.

Table 5: The effect of Mediation

Hypothesis	Std. Direct effect without mediation	Std. Direct effect with mediation	Std. Indirect Effect	Mediation Type
H8: AX→PE→BI	-0.301***	-0.297 ***	-0.092 ***	Partial Mediation
H9: AX →EE →BI	-0.301***	-0.296***	0.01 (ns)	No mediation

*** =p<0.001; ns = not significant

The multi-group analysis was performed to examine the moderating effect of the two demographic variables (age and gender) on the relationship between AX and BI. For

this, the sample was divided using the grouping variables (age and gender), and subgroups were created. Accordingly, two gender groups (male and female) and two age groups (younger and older) were formed. Thereafter, chi-square differences ($\Delta\chi^2$) were obtained between baseline (unconstrained path) model and constrained path model at *p-value* < 0.05 level (Baron & Kenny, 1986). Then, path invariance across subgroups was obtained (confirm moderation by the demographic variable being selected) by measuring the chi-square difference value above 3.84 (95% CI) for each path (Zainudin, 2012).

The effect of age and gender moderation is tabulated in table 6.

Table 6: The effect of Moderation

			Stdardised path (β)	χ^2	df	CFI	RMSEA	χ^2 /df	$\Delta\chi^2$	Δdf	Result on moderation	Result on hypothesis	Reference
Male (#106)													
	AX to BI	Unconstrained	-0.21	454	367	0.96	0.048	1.24					
	AX to BI	constrained path		562	368	0.90	0.071	1.53	108.0	1	Significant	Supported	Celik. H. (2016)
Female (#113)													
	AX to BI	Unconstrained	-0.37	504	367	0.95	0.058	1.37					
	AX to BI	constrained path		642	368	0.89	0.082	1.74	137.6	1	Significant	Supported	Celik. H. (2016)
Younger Group (#110)													
	AX to BI	Unconstrained	-0.25	454	367	0.96	0.047	1.24					
	AX to BI	Constrained path		554	368	0.91	0.068	1.50	99.3	1	Significant	Supported	Celik. H. (2016)
Older Group (#109)													
	AX to BI	Unconstrained	-0.29	475	367	0.96	0.052	1.29					
	AX to BI	Constrained path		603	368	0.90	0.077	1.64	127.3	1	Significant	Supported	Celik. H. (2016)

The outcome of invariance analysis revealed that the effect of technology anxiety on behavioral intention to use VLE was different across the two genders ($\Delta\chi^2$ (1) >3.84) where female group showed high salience (β=-0.37, p <0.001). Similarly, the effect of anxiety on BI significantly varied across the two age groups; where older lecturers showed high salience (β=-0.29, p <0.001). In summary, it was evident that the effect of anxiety on behavioral intention was more salient to older women in accepting the virtual learning platform. The result was consistent with the findings of Celik (2016) who studied the online shopping behavior of consumers.

6. Discussion

In attempting to examine the non-user adoption intention to VLEs in the local university setting, the present study extended the UTAUT model by adding technology anxiety as a determinant of the behavioral intention of non-users. By doing so, an Affective (emotional) component is added to a framework (UTAUT) which is predominantly relying on cognitive components in predicting behavior. Further, this model evoked new relationships between technology anxiety and UTAUT predictors such as performance expectancy and effort expectancy.

Results of the study revealed that technology anxiety (AX) impede lecturers' VLE adoption consistently to the findings of previous studies (Celik, 2016; Maican et al.,

2019; Powell, 2013). Outcome of mediation analysis indicate that AX exerts part of its effect on behavioral intention through PE, thus the negative effect of anxiety is lessening in presence of individuals' performance beliefs. further, the feeling of anxiety anteceding effect on both performance and effort beliefs of lecturers towards VLE that varies among age and gender groups. Older female lecturers were found to be more affected due to the negative consequence of anxiety on behavioral intention to use VLE. This finding could be explained with the evidence was found through many previous studies to suggest that females are less comfortable in dealing with computers and technology due to high feminine traits exhibited by them. Along these lines, women are considered emotional and highly intuitive, thus prevented from developing an adequate level of self-efficacy (Venkatesh, Morris, & Ackerman, 2000). Further, scholars say that older people are less technology savvy due to decreasing physical and cognitive ability in them (Tacken, Marcellini, Mollenkopf, Ruoppila, & Szeman, 2005); due to peoples' interests and needs change at old age (Wong, Russo, & McDowall, 2012); and also due to differences in their attitudes (Juric & Lindenmeier, 2018).

Performance expectancy (PE) was the strongest determinant of behavioral intention to use VLE. This result was consistent with many UTAUT based studies (Harris, Mills, Fawson, & Johnson, 2018; Skoumpopoulou, Wong, Ng, & Lo, 2018; Venkatesh et al., 2003) This means that lecturers assess perceived cost (effort and so on) versus benefits (time-saving and so on) of using VLE and higher the perceived benefits, greater are the adoption intentions.

Facilitating Conditions (FC) was found to have a strong positive effect on lecturer's behavioral intention to adopt VLE. This result was consistent with many UTAUT based studies (Venkatesh et al., 2012). Findings indicate that facilities and support services inspire lecturers' intent to use the VLE.

In contrast, effort expectancy (EE) had no direct effect on lecturer's behavioral intention to adopt VLE. Similar results were observed in previous studies where both AX and EE variables were simultaneously tested (Khechine & Lakhal, 2018; Van Raaij & Schepers, 2008). One possible reason for this outcome is the high anxiety levels of lecturers, which generate less computing self-efficacy that lead to negative perceptions about ease of use (Venkatesh et al., 2000).

Social Influence (SI) was not a significant predictor of behavioral intention to adopt VLE. This outcome contradicts with the findings of Venkatesh et al. (2003). However, results were in line with some other studies conducted in voluntary settings (Khechine & Lakhal, 2018; Venkatesh & Davis, 2000).

The study sample of this research was the non-users, who self-reported the non-usage of VLE. Thus, Actual usage was not considered as a study variable. However, they were aware of the VLE that existed in the university environment and proposed extended UTAUT framework was validated in this context with added variable "technology anxiety." The findings of this study would be useful in the local university context to attract current non-user towards the VLE use.

6.1 Research Implications

This research relied upon UTAUT framework, which was modified by incorporating technology anxiety as a unitary construct in testing academic Non-user's adoption intentions towards the university VLE system. Results validated the significance of technology anxiety in predicting behavioral intention towards VLE use which was more salient for older women. Thus, this study provides several theoretical, practical and methodological contributions to the body of knowledge in IS system acceptance; particularly in the field of teacher's technology acceptance in voluntary settings. The results emphasize the need to alter IS adoption theories to suit organizational settings where system usage is at own discretion (voluntary) while recognizing personal differences and adoption barriers.

A unique combination of factors was identified in this study proving that, cognitive (performance expectancy), affective (Anxiety) factors, as well as external facilitation (facilitation conditions), trigger adoption intentions among non-users. Further, anxiety was found to have a negative anteceding effect on performance and effort expectations. What more, part of its effect on behavioral intention was exerted through PE. Additionally, the significance of anxiety varied across age and gender groups.

The study contributed to the quantitative methodological strategy by establishing acceptable levels of validity and reliability among study variables. Moreover, the study provided a suitable framework to examine non-users' VLE adoption intentions in Sri Lankan State university environment.

In terms of practical contribution, the findings of the study would be useful for university administrators, quality assurance (QA) teams and IT/MIS personnel in improving practical benefits and promoting system usage among academic staff in order to have a higher uptake of VLE system. For instance, staff training, language skills, competency building, improve system design and flexibility, would be some apparent wins in increasing system adoption. However, it would also be essential to recognize that non-users as one homogeneous group; thus, before actioning the findings, user perceptions, as well as lapse user perceptions, should be assessed.

6.2 Limitations and Direction for Future

Time restrictions and study scope have imposed certain limitation to this study. First of all, the focus of this study was on VLE non-users only. Their perceptions about VLE adoption was tested, but other user perceptions about VLE adoption were ignored. (such as current users, and other stakeholders such as students and administrators). Secondly, the study design was cross-sectional; thus, measures of perceptions were obtained at a particular time interval.

Further, the survey method was quantitative. Therefore, deep-rooted insights about non-usage and VLE perceptions could not be captured for a qualitative interpretation. Due to above limitations, future researchers are recommended to focus on longitudinal studies, employ a mixed method for data collection, and consider

observing multiple groups of respondents (users and non-users, students, administrators).

7. Conclusion

This study validated a novel theoretical framework that was developed based on UTAUT, in a new cultural setting. In this study, VLE adoption intentions of non-users in the university staff were surveyed, and findings would be valuable to the current IS literature, particularly to the body of knowledge in the arena teacher's technology acceptance.

Strong support was obtained for the primary UTAUT construct, performance expectancy (PE) but key UTAUT constructs such as Effort expectancy and Social Influence were not supported in this study. This challenges wide acceptability and generalizability of original UTAUT framework. Further, this study supported the inclusion of technology anxiety (emotional component) with great parsimony, thus lessen ambiguity of further researchers in incorporating it as an external construct. Finally, the findings would be useful to improve the design of the VLE system as well to change the publicizing aspect of the system among the non-users to increase initial adoption and continued usage. In particular, system designers should improve the system in terms of service benefits, (i.e., technical functions, features, help options and so on) while administrators and quality teams should publicize these benefits while prompting trial usage. It is also essential to bring in clear policies and guidelines of usage to engage a bigger audience.

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