THE AFRICAN JOURNAL OF FINANCE AND MANAGEMENT - VOLUME 26 NO. 1, 2017: 61-75

The Role of Personal Traits and Learner's Perceptions on the Adoption of E-learning Systems in Higher Learning Institutions

*Daniel Koloseni & Herman Mandari**

Abstract

This paper investigates the role of personal traits and learner's perceptions through the lens of Technology Readiness Index (TRI) and Unified Theory of Acceptance and Use of Technology (UTAUT). Data were collected using questionnaire from students in six (6) higher learning institutions in Tanzania. Data analysis employed a structural equation modelling (SEM) technique. The study found that optimism, and discomfort constructs have an influence on effort expectancy and performance expectancy of e-learning systems, while insecurity has an influence on effort expectancy only. Furthermore, the study found that effort expectancy and social influence have positive influence on intention to adopt e-learning systems, while intention to adopt e-learning systems has significant relationship with actual usage of the systems. The study recommends higher learning institutions to develop e-learning policies that focus on improving effort expectancy, awareness of the benefits of e-learning systems, encouraging social pressure and behavioural intention to lure more students to adopt e-learning systems. These policies should also take into account a leaner's personal traits such as optimism, discomfort and insecurity to make them effective.

Keywords: *e-learning, personal traits, learner's perceptions, technology adoption, technology readiness index, unified theory of acceptance and use of technology*

1. Background*

Advancements in technology have changed the way education is provided in various academic institutions. While traditional learning process was conducted in physical classes, with advancements in technology in recent years the learning process is now conducted through a virtual learning environment referred to as e-learning. E-learning may be defined as the use of information and communication technology (ICT) such as internet and the world-wide-web to deliver various solutions that may enhance skills and knowledge to learners (Haron et al., 2012). The use of e-learning in teaching environment tends to maintain the standards and quality of education without limitation on specific location (Shoniregun & Gray, 2003). E-learning has been categorized into three main types: (i) use of technology to supplement or replace face-to-face course, (ii) integration of online activities to traditional learning process (blended mode); and (iii) online course that is entirely conducted online by using various technologies (Karim & Hashim, 2004).

The e-learning market share expects to experience major growth in the next five years (i.e., 2017-2021), with social networks and learning systems that embrace collaborative tools and mobile delivery among the top learning technologies priorities (Dacebo, 2017), thanks to increased internet speed and technology sophistication. This trend is an indication of the importance of e-learning systems. Advantages offered by e-learning such as interactive communication between learners

* Faculty of Computing, Information Systems & Mathematics, Institute of Finance Management, Tanzania: dkoloseni@gmail.com / mandariherman@gmail.com

and instructors or between learners without time limitation, space and geographical boundaries are key drivers for its adoption in many businesses and learning institutions (Clark & Mayer, 2016; Katz, 2000).

In Tanzania, various higher learning institutions such as the University of Dar es Salaam (UDSM), University of Dodoma (UDOM), The Institute of Finance Management (IFM), Tanzania Institute of Accountancy (TIA) and Open University of Tanzania (OUT) have adopted a blended mode to enhance teaching and learning process. This is due to increased number of students in recent years as a result of education sector reforms (URT, 2010). Various e-learning systems like Moodle Learning Management System, A-tutor and Black Board are commonly used in Tanzania higher learning institutions (Bhalalusesa et al., 2013).

Research Problem

Higher learning institutions have invested huge amount of resources to ensure e-learning systems works accordingly. Despite these investment efforts, the acceptance of e-learning systems is still low (Lwoga, 2012; Mahenge & Sanga, 2016; Sife et al., 2007). The success of e-learning systems depends highly on the readiness and acceptance of learners.

Various studies have been conducted on e-learning in Tanzania (Lwoga, 2012; Lwoga & Komba, 2015; Mtebe & Raisamo, 2014b; Mtega et al., 2013; Rumanyika & Mashenene, 2015). However, only few studies (Lwoga & Komba, 2015; Mtebe & Raisamo, 2014) have quantitatively examined the relationships between factors influencing student's intention to adopt and use e-learning systems. Lwoga and Komba (2015) and Mtebe and Raisamo (2014) studied students' perceptions on the intention to adopt and use e-learning systems. However, to accurately predict students' perceptions and adoption behaviour on e-learning technology, it is imperative to examine students' personal traits that also may affect individual's e-learning adoption intention and usage (Chien et al., 2007). Hence, the current study goes beyond students' perceptions and investigates both students' perceptions and their personal traits in Tanzania higher learning institutions.

The main objective of this study is to investigate the influence of personal traits and perceptions of learners on e-learning adoption in Tanzania. Overall, the study contributes to the body of knowledge in two ways. First, most of the previous e-learning studies in Tanzania have concentrated on identifying factors that may influence adoption and ignored the role of adopters' personal traits on the intention and usage of e- learning systems. Therefore, this study fills this research gap by studying the influence of personal traits. Second, this study extends the ability of UTAUT to explain technology adoption behaviour by integrating it with TRI. The integration of these two theories will provide more knowledge to academicians since studies that integrate TRI and adoption models such as UTAUT are scarce.

Research Model and Hypotheses Development

To understand factors influencing learners to adopt and use e-learning systems, the current study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al., 2003), and the Technology Readiness Index (TRI) developed by Parasuraman (2000). UTAUT is the most applied and preferred theory in studying acceptance and usage of technology (Dwivedi et al., 2011).UTAUT is most preferred because it combines various constructs from eight different technology adoption theories to explain technology adoption.

The combination of different technology adoption theories to form UTAUT helped to address the limitations of other previous

models and produced a theory (i.e., UTAUT) with a high explanatory power (up to 70% of the variance) compared to other technology adoption theories (Venkatesh et al., 2003). Therefore, using UTAUT in the present study may produce results that are more robust in explaining the intention to adopt and use of e-learning among the learners in Tanzania higher learning institutions.

Furthermore, past studies claims that the intention to adopt and use technology may highly be affected by an adopter's (user's) attitude on the technology (Davis, 1989). However, an adopter's attitude depends on technology readiness (TR). An adopter's attitude is referred to as a general belief and thinking on technology sought to be adopted, while TR is referred to as people's tendency to embrace and use new technologies to accomplish various goals (Parasuraman, 2000; Tsikriktsis, 2004). Lin et al. (2007) argue that technology readiness index is important in technology adoption because of its effect on satisfaction on intention to use a particular technology; such that the higher the technology-readiness index, the higher satisfaction on intention to use a particular technology. Also, it has been proven that cognitive information of technology readiness (optimism, innovativeness, insecurity and discomfort) has influence on individual perception to adopt technology (Lin et al., 2007; Walczuch et al., 2007). Therefore, there is the need to study the effect of personal traits (cognitive information of technology readiness) of technology in the adoption of e-learning. Figure 1 shows the research model of the present study.

Optimism is defined as a positive belief about technology that can increase control, flexibility and efficiency, while innovativeness is considered to be a tendency of being the first to use technology (Parasuraman & Colby, 2007). It is theorized that optimism and innovativeness have positive influence on an adopter's attitude towards a particular technology. A number of studies have shown that optimism and innovativeness have positive influence on perceived ease of use (effort expectancy) and usefulness (performance expectancy) (Erdogmus & Esen, 2011; Shin & Lee, 2014).The present study argues that optimism will have a positive effect on a learner's attitude regarding e-

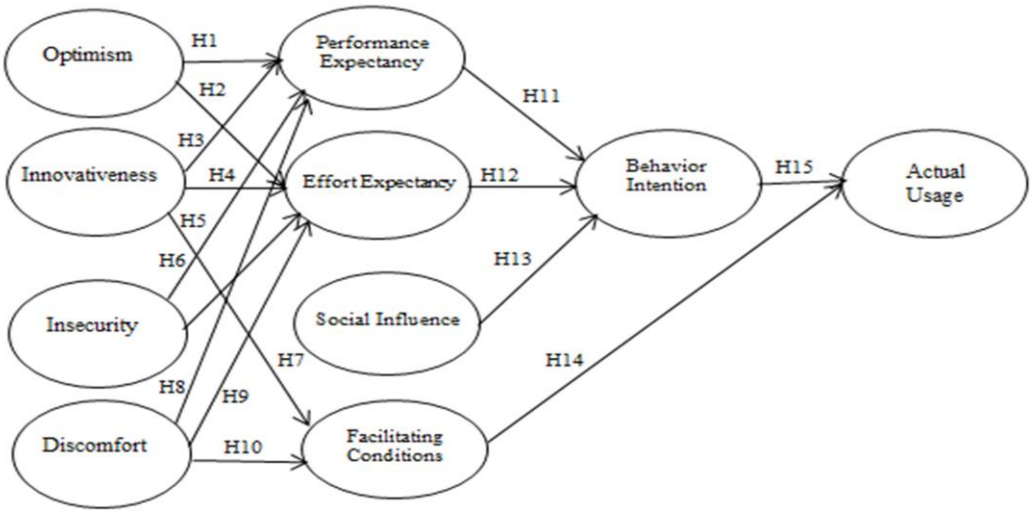

Figure 1: Research Model

(Adopted from Venkatesh, Morris, Davis and Davis (2003) and Parasuraman (2000))

learning performance expectancy and effort expectancy, while innovativeness will influence a learner's attitude on performance expectancy, effort expectancy and facilitating conditions (Chen & Li, 2010). Based on the above arguments, this study hypothesizes that:

H1: Optimism about technology in general leads to higher perceived performance expectancy.

H2: Optimism about technology in general leads to higher perceived effort expectancy.

H3: Innovativeness about technology in general leads to higher perceived performance expectancy.

H4: Innovativeness about technology in general leads to higher perceived effort expectancy.

H5: Innovativeness about technology in general leads to higher perceived facilitating conditions.

Discomfort is defined as desire for control and a sense of being overpowered, while insecurity is referred to as distrust on technology to provide security and privacy (Erdogmus & Esen, 2011). Discomfort and insecurity are considered as main inhibitors of technology readiness (ibid.).The information system security of any system comprises of confidentiality, integrity and availability.

In e-learning environment specifically, integrity and availability are very important. If learners perceive that the technology may not be providing credible and consistency information, and not available when required, this may affect their readiness in using the technology. Furthermore, discomfort may have negative impact on the use of technology. For example, if learners think that they lack enough expertise to use the e-learning system due to their previous experience of the technology, they are likely to avoid the use of the system (Sophonthummapharn & Tesar, 2007). Various studies have shown that discomfort and insecurity have a negative effect on the perceived ease of use (effort expectancy) and perceived usefulness (performance expectancy) (Erdogmus & Esen, 2011; Parasuraman, 2000). Based on previous studies, the current study hypothesizes that:

H6: Insecurity on technology in general leads to lower perceived performance expectancy.

H7: Insecurity on technology in general leads to lower perceived effort expectancy.

H8: Discomfort on technology in general leads to lower perceived performance expectancy.

H9: Discomfort on technology in general leads to lower perceived effort expectancy.

H10: Discomfort on technology in general leads to lower perceived facilitating conditions.

Performance expectancy is defined as the extent to which an individual believes that using a particular technology tends to improve his/her job performance (Venkatesh et al., 2003).In the present study, performance expectancy relates to the degree to which learners believe that using e-learning system will improve their learning performance. Various studies argue that users are motivated to use a particular technology based on its usefulness (Njoroge & Koloseni, 2015; Mtebe & Raisamo, 2014;Venkatesh et al., 2003).This suggests that as users perceive a technology to be more useful in accomplishing their job and improving their performance, their likelihood to adopt the technology tends to increase. Furthermore, previous studies in e-learning technologies have concluded that performance expectancy is a key factor in influencing learners' intention to adopt e-learning systems (Chen, 2010; W. Lin & Wang, 2012; Roca et al., 2006; Seddon, 1997).

In the same vein, if learners perceive that e-learning may improve their learning performance, then the likelihood to adopt it increases. Based on this fact, this study hypothesizes that:

H11: Performance expectancy has a direct and positive influence on learners' intention to adopt e-learning systems.

Effort expectancy is defined as the extent to which users perceive that using a particular technology will require less physical and mental effort (Venkatesh et al., 2003). Users are influenced to adopt technology when they perceive that it is easy to use. Effort expectancy tends to reduce the level of uncertainty of the users on the technology (Elliot & Fu, 2008). In the settings of higher learning institution, students are considered less technology savvy because in secondary school most of them do not learn ICT due to the lack of computers and qualified ICT teachers (Sedoyeka & Gafufen, 2013). Therefore, providing an e-learning system that requires less effort is important for them to adopt. Various empirical studies have been conducted to study the relationship between effort expectancy and behaviour intention, and the results show that there is a significant relationship between the two constructs (Mtebe & Raisamo, 2014b; Olatubosun, Olusoga & Samuel, 2015). Based on the findings of the previous studies, this study hypothesizes that:

H12: Effort expectancy has direct and positive influence on learners' intention to adopt e-learning systems.

Social influence is an individual belief that other people close to one believe that s/he should adopt the technology (Venkatesh et al., 2003). In the current study, social influence describes the degree to which a learner believes that his/her friends, colleagues, and family members believe s/he should adopt an e-learning system. Various empirical studies have shown that social influence has positive and direct relationship to a learner's intention to adopt e-learning (Khechine et al., 2014; Mtebe & Raisamo, 2014). Hence, the hypothesis:

H13: Social influence has direct and positive influence on learners' behaviour intention to adopt e-learning systems.

Facilitating condition is defined as the degree to which an adopter believes that there is support to use the technology (Venkatesh et al., 2003). Previous studies have pointed out that support provided by organization in terms of technical support, training and management support tends to influence users decision to accept or reject a particular technology (Mtebe & Raisamo, 2014). Additionally, various empirical studies have shown that a facilitating condition has a significant influence on a learner's usage behaviour (Akbar, 2013; Khechine et al., 2014). In line with previous studies, this study hypothesizes that:

H14: Facilitating condition has direct and positive influence on learners' actual behaviour to use e-learning systems.

Behaviour intention is defined as the likelihood of an adopter to engage in a certain behaviour (Venkatesh et al., 2003). Behaviour intention is considered to be a direct and significant determinant of actual usage behaviour in various models (ibid.). Moreover, several empirical studies have shown that there is a statistical significance relationship between behaviour intention and actual usage (Umak et al., 2010; Triandis, 1979). Similarly, the present study suggests the following hypothesis:

H15: Leaner's behaviour intention has a direct and positive effect on actual usage of e-learning systems.

Research Methodology

This study used a questionnaire to collect data. The questionnaire contained three sections: introduction, demographic information, and measurement items. A total of 41 measurement items borrowed from previous studies were used (Parasuraman, 2000; Venkatesh et al., 2003).

All items were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). To improve the quality of the research instrument, a designed questionnaire was sent to IS and e-learning experts to check for ambiguous words, demand

characteristics and relevance of items. The questionnaire was later modified based on experts' comments.

The Google form, which is considered as effective and efficient tool in managing online questionnaire, was used to collecting data in this study (Lin & Jou, 2012). The Google form web link was distributed to students through emails and social media platforms: WhatsApp and Facebook. This is because using email and social media make it is easier to administer the questionnaire and reach a large number of targeted respondents (Millar & Dillman, 2011). Respondents were sourced from the following higher learning institutions: Institute of Finance Management (IFM), College of Business Education (CBE - DSM campus), Tanzania Institute of Accountancy (TIA), Institute of Accountancy Arusha (IAA),Open University of Tanzania (OUT), and University of Dodoma (UDOM).

Most previous studies have used heterogeneous population to examine acceptance behaviour of e-learning in Tanzania (i.e., students, instructors, researchers and administrators). Using heterogeneous population in a single study makes it difficult to precisely predict users' behaviour because heterogeneous population may weaken the outcome of a study due to different characteristics of respondents (Calder et al., 1981). Since students are the key players in e-learning systems—in fact they are the reason for e-learning deployment—identifying factors that could influence their perception could expand the limited knowledge in e-learning acceptance. Therefore, the current study uses students only as respondents to examine factors that could motivate them to adopt e-learning technology.

A list of students' emails was obtained from coordinators of the respective programmes of the study. For respondents whom we were unable to get their emails, lecturers from the respective higher learning institutions were contacted to assist in distributing the questionnaire link to their students through WhatsApp and Facebook groups. Most students in higher learning institutions in Tanzania have either WhatsApp or Facebook group for education purposes (Kibona & Mgaya, 2015; Lubua, 2016). Therefore, the questionnaire was accessible to large number of students through online groups. Several reminders were used to increase response rate and ensure that more students participated in the study.

The results of this study could be affected by the presence of excessive common method variance (CMV) due to the use of self-reported method (Mossholder et al., 1998). Therefore, the following measures were considered in order to reduce the effect of CMV: (i) anonymity and confidentiality of respondents were protected; (ii) the name of the constructs was not included in questionnaire; and (iii) respondents were not aware of the conceptual framework of the study. To examine the inter-relationship between endogenous and exogenous variables in the current study, the structural equation modelling (SEM) was adopted. SEM was used because it takes care of measurement errors and analyses all the relationships in a single analysis (Chin, 1998),thus ensuring that results produced from the analysis are better.

Results

A total number of 327 responses were collected from respondents; and 52 cases were dropped due to large percentage of missing values. The study found ten (10) cases with a total of 22 missing values after conducting a MCAR test (Little, 1988). The MCAR test results were not statistical significant (x^2 (693.3) = 666.7, p = 0.755), indicating that values were missing at random. Missing values were replaced by using the expectation maximization (EM) method. After data screening, 275 valid responses remained and were used for subsequent data analysis. Table 1 shows the descriptive information of the respondents.

Table 1: Sample Demographics

Characteristics	Group	Frequency	(%)
Gender	Female	123	44.7
	Male	152	55.3
Age	15-24	149	54.2
	25-34	107	38.9
	35-44	18	6.5
	45 and above	1	.4
Programme	Certificate	23	8.3
	Ordinary Diploma	17	6.2
	Bachelor	188	68.4
	Postgraduate Diploma	6	2.2
	Masters	41	14.9

Notes: Sample size (N) = 275

Data normality was assessed by checking skewness and kurtosis values of the measurement items. An absolute value below 2 and 3 for skewness and kurtosis respectively denotes a normal distribution of the items (Awang, 2015). The absolute values produced in this study for skewness range from 0.616 to 1.175; and kurtosis ranges from 0.174 to 1.934, which is within the acceptable thresholds.

The IBM AMOS (Version 22) software was employed to analyse the inter-relationships among the variables. The confirmatory factory analysis (CFA) using maximum likelihood estimation method was employed to estimate factorial validity of the parameters.

Model fitness was assessed by using the following fitness indices: chi-square (x^2), normed chi-square (x^2/df), comparative fit index (CFI), incremental fit index (IFI) and root mean square error of approximation (RMSEA). These fit indices are the most recommended as they represent different aspect of model fit (Boomsma, 2000; Kline, 2005). Model fit is achieved when x^2 is considered to be small and p value is greater than 0.05 (Kline, 2005). However, various studies have shown that x^2 is sensitive to large sample size, it become smaller as sample size increases, therefore, normed chi-square should be considered as well since it minimizes the effect of sample size (ibid.).

Furthermore, model fit is attained if CFI and IFI > 0.9, x^2/df< 3, and RMSEA< 0.08 (Hu & Bentler, 1999). Based on this requirement, a pooled CFA procedure with 41 items was conducted. The results on initial measurement model analysis shows that five items—IN1, INS1, DS4, DS5 and DS6—produced loading value below 0.5.Therefore, these were deleted to attain unidimensionality (Awang, 2015). Additionally, IN2 and IN3 were found to have higher modification indices, and therefore, were set as free parameters to improve model fit (Awang, 2015). Figure 2 shows the final adjusted measurement model used in subsequent analysis.

Furthermore, the final adjusted measurement model was assessed for validity and reliability. Table 2 shows that the average variance extracted (AVE) for each construct was above 0.5, denoting that convergent validity has been achieved (Baggozi & Yi, 1988). As Figure 2 shows, all fit indices were achieved; indicating that construct validity is also achieved. Composite reliability (CR) was assessed to measure the internal reliability of the constructs. As Table 2shows, all construct produced CR values greater than 0.7 (Nunnally, 1978), which means that all constructs are reliable.

Discriminant validity was assessed by checking the correlation among the constructs and the square root of the AVE. Table 2 shows that all correlation values are below 0.85, and diagonal values are greater than values in their respective rows and columns (Fornell & Larcker, 1981). This shows that discriminant validity was achieved. Next, multicollinearity was assessed using the collinearity test. Variance inflation factor (VIF) value less than 10 is always acceptable (Hair et al., 1998). Table 3 shows that VIF is within the required threshold, indicating that multicollinearity is not a problem in this study.

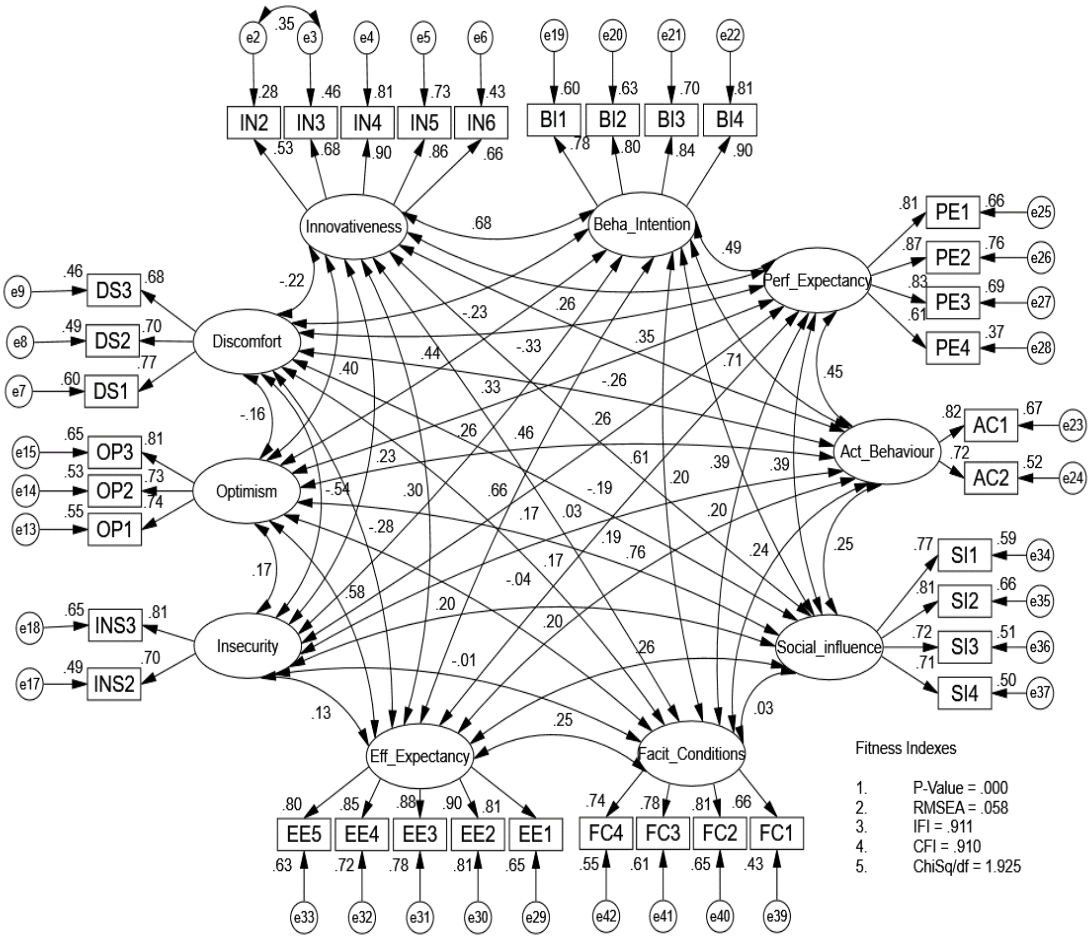

Figure 2: Adjusted Measurement Model

Table 2: Discriminant Validity Index Summary

	CR	AVE	1	2	3	4	5	6	7	8	9	10
1	0.865	0.619	0.787									
2	0.852	0.544	0.258	0.738								
3	0.761	0.516	-0.330	-0.224	0.718							
4	0.803	0.577	0.334	0.396	-0.162	0.760						
5	0.726	0.572	0.174	0.226	-0.543	0.170	0.756					
6	0.897	0.687	0.487	0.681	-0.228	0.441	0.258	0.829				
7	0.928	0.720	0.605	0.305	-0.279	0.585	0.131	0.660	0.848			
8	0.840	0.568	0.393	0.257	-0.188	0.169	0.203	0.389	0.259	0.753		
9	0.745	0.594	0.450	0.350	-0.264	0.461	0.191	0.710	0.759	0.252	0.771	
10	0.836	0.562	0.205	0.034	-0.045	0.201	-0.007	0.197	0.253	0.030	0.243	0.749

Where: CR: Composite Reliability; AVE: Average Variance Extract; 1: Performance expectance; 2: Innovativeness; 3: Discomfort; 4: Optimism; 5: Insecurity; 6: Behaviour Intention; 7: Effort Expectancy; 8: Social Influence; 9: Actual Behaviour; 10: Facilitating conditions

Table 3: Multicollinearity Assessment

Factor	Tolerance	VIF
Innovativeness	.509	1.966
Discomfort	.718	1.394
Optimism	.692	1.446
Insecurity	.772	1.295
Performance Expectancy	.601	1.664
Effort Expectancy	.425	2.354
Social Influence	.689	1.452
Facilitating Condition	.918	1.089
Behaviour Intention	.352	2.841

To test the hypotheses of the study, structural model was examined. Model fit was assessed by using similar indices presented above. Nevertheless, the initial structural model did not attain the adequate model fit due to low factor loading produced by three items (IN2, IN6 and PE4). Therefore, further model modification was conducted by deleting the above three items. Figure 3 shows the results of the adjusted structural model with adequate model fit (x^2 (470) = 964.3243, p <0.001, x^2/df = 2.052, CFI= 0.903, IFI = 0.904, RMSEA = 0.062). The study tested 15 hypothetical relationships between constructs of the study.

The relationships between the antecedents constructs (optimism, insecurity, discomfort, and innovativeness) were explored first. The study found that optimism leads to higher levels of performance expectancy (β = 0.33, p = 0.001), and effort expectancy (β = 0.59, p = 0.001), respectively. The results of the study also indicated insecurity on technology in general leads to lower perceived effort expectancy (β = -0.18, p = 0.036).

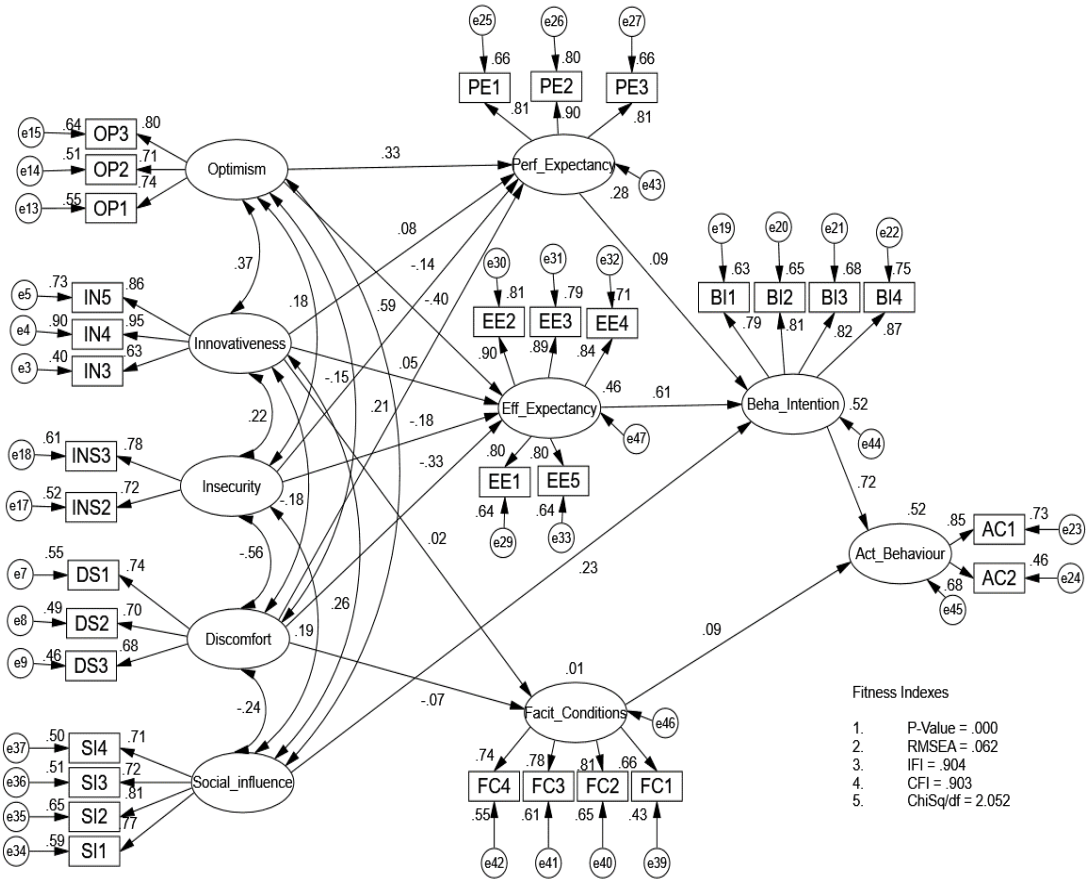

Figure 3: Structural Model

Furthermore, the relationships between learner's discomforts on technology and performance expectancy (β = -0.44, p = 0.001), and the relationship between learner's discomforts on technology and effort expectancy (β = -0.33, p = 0.001) indicates that higher levels of discomforts lead to lower levels of performance expectancy and effort expectancy respectively.

Also, the study explored the individual perceptions on intention to adopt e-learning systems and actual utilization of e-learning systems. As predicted, the relationships between effort expectancy and learner's intention to adopt e- learning systems (β = 0.61, p= 0.001), social influence on learner's intention to adopt e- learning systems (β = 0.23, p = 0.001), leaner's intention to adopt e-learning systems on actual usage of e-learning systems (β = 0.0.72, p = 0.001) were all supported.

Overall, the results in the structural model indicate that eight (8) potential hypothetical out of 15 relationships were statistically significant. Specifically, the study found that *H1, H2, H7, H8, H9, H12*, *H13* and *H15* were supported. On another hand, *H3, H4, H5, H6*, *H10, H11* and *H14* were not supported. In this study, all hypothetical relationships were deemed statistically significant at $p \leq 0.05$. Table 4 shows the detailed results of the hypotheses testing.

Discussion

The study shows that the relationship between optimism and performance expectancy is statistically significant. This results is consistent with previous studies showing that optimism tends to produce positive and direct effects on performance expectancy (Erdogmus & Esen, 2011; Shin & Lee, 2014). Similarly, optimism was found to be positively influencing effort expectancy. This result is also consistent with previous studies showing that optimism has a direct and positive effect on effort expectancy (Erdogmus & Esen, 2011; Shin & Lee, 2014).

This result shows that positive belief about technology tends to have a positive effect on students' perception to adopt e-learning systems in Tanzania. Similarly, Walczuch et al. (2007) argued that being optimistic and focusing on positive effect of technology tends

Table 4: Hypotheses Testing Results

Hypothesis	Effect estimate	t- Values	P-Values	Result
H1	0.33	4.3805	***	Supported
H2	0.5855	7.5735	***	Supported
H3	0.0777	1.1311	0.258	Not supported
H4	0.0468	0.7651	0.4442	Not supported
H5	0.0206	0.2945	0.7684	Not supported
H6	-0.1357	-1.4423	0.1492	Not supported
H7	-0.1788	-2.1019	0.0356*	Supported
H8	-0.3973	-4.1418	***	Supported
H9	-0.3313	-3.8954	***	Supported
H10	-0.0686	-0.9017	0.3672	Not supported
H11	0.0858	1.5673	0.117	Not supported
H12	0.6076	9.2395	***	Supported
H13	0.2333	4.2089	***	Supported
H14	0.0899	1.5124	0.1304	Not supported
H15	0.7154	10.4605	***	Supported

Where * p < 0.05*** p < 0.001

to increase the likelihood of using technology. This finding implies that higher leaning institutions should promote learner's optimism, which could in turn increase learner's perception to adopt e-learning systems. This could be done through training to increase better knowledge of e-learning technology and attitudes of learners.

Significant negative effect of insecurity on effort expectancy is consistent with previous IS studies, such as that of Walczuch et al. (2007). Furthermore, discomfort was found to have a negative effect on performance expectancy. This findings is consistent with previous studies (Shin & Lee, 2014; Walczuch et al., 2007). In addition, the study findings also indicate that effort expectancy is negatively affected by discomfort. This corroborates previous IS studies (Shin & Lee, 2014; Walczuch et al., 2007). This finding suggest that high perception on the lack of control and being overwhelmed by technology will tend to reduce the likelihood of learners to adopt e-learning technology in higher learning. To motivate learners to adopt e-learning systems, higher learning institutions should focus on reducing the effects of insecurity and discomfort in using technology. This could be done by increasing awareness campaign particularly on availability and reliability of e-learning systems, providing ease to use e-learning systems, and by providing a rich online help option that can assist in reducing discomfort of students when using e-learning systems.

The significant relationship between effort expectancy and behaviour intention indicates that ease of use is an important factor in convincing students in higher learning institutions to adopt e-learning systems. This finding is consistent with previous studies in technology adoption (Abrahão et al., 2016; Lwoga & Komba, 2015; Oye et al., 2014). This finding implies that the design of e-learning systems—whether accessed through personal computers or mobile platforms—should be easy to use to encourage students to use them. A complex e-learning system will make students uninterested to use it (Awwad & Al-Majali, 2015). Therefore, designers of e-learning systems should engage end-users in the designing process so as to develop, customize or acquire an easy to use e-learning system (Greenbaum & Kyng, 1991).

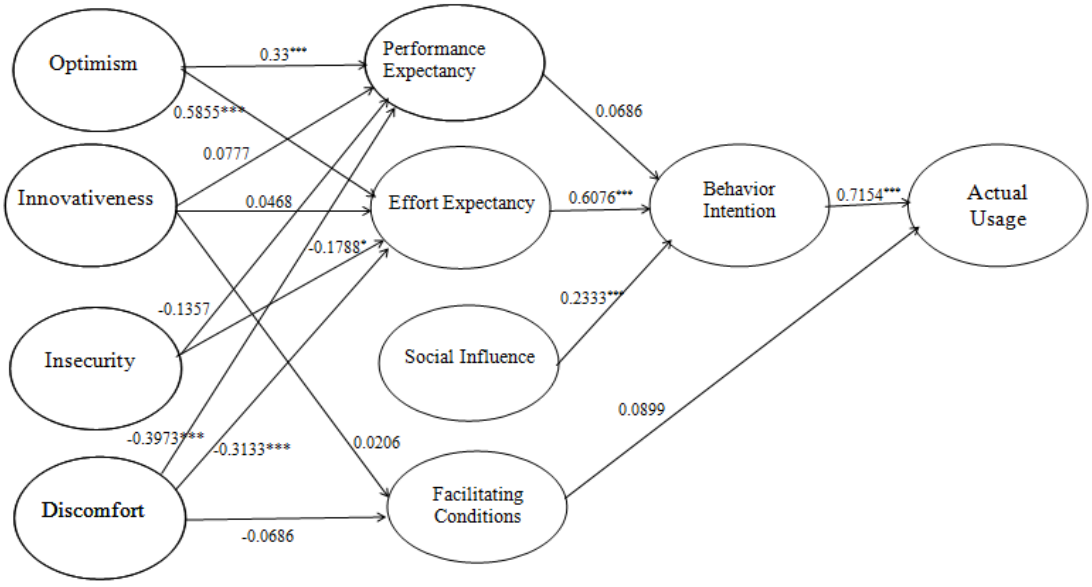

Figure 5: Final Validated Research Model

Social pressure has a significant impact in increasing students' intention to use e-learning systems. This finding indicates that students would be motivated to use e-learning systems after seeing other students and instructors using it or advocating its usage. Thus, there is a need for higher learning institutions to lay strategies advocating the utilization of e-learning systems among its students and instructors. Increased use of e-learning system among students and instructors will lure more students to use the system. This finding corroborates past studies in technology adoption (Abrahão et al., 2016; Lee, 2010; Lwoga & Komba, 2015; Martins et al., 2014). Actual students' usage of e-learning depends on their intention to use the system.

Conclusion and Limitations of the Study

The internet has revolutionized the way learning is delivered in higher learning institutions. The power of the internet has motivated higher leaning institutions world-wide to adopt e-learning systems. Several studies have been conducted worldwide to ascertain factors that may influence the adoption of e-learning systems. However, empirical evidence indicates that previous studies on the adoption of e-learning systems did not consider the personal traits of learners.

This study integrated TRI and UTAUT to investigate the influence of personal traits on learners' perceptions during e-learning system adoption. Personal traits such as optimism, insecurity and discomfort with technology play a key part in influencing individual perceptions towards the adoption of e-learning systems. The influence of personal traits provides a new perspective in the design of e-learning policies. Specifically, policy and decision makers should pay attention to personal traits as well as developing policies that work. For each construct that is influenced by personal traits, a respective policy should take into account personal trait that has influence on it.

Since the study adopted the Snowball sampling technique, the results may have limitation on generalization. Thus, future studies should employ probability-sampling techniques to achieve generalizable results. Furthermore, the study also used cross-sectional design, which again makes the results generated from this approach to have limitations. For instance, when students acquire more knowledge on technology after a given period of time their personal traits and perceptions on e-learning may change. Therefore, future studies may concentrate on studying the effect of change in students' personal traits over a period of time in the adoption of e-learning.

References

Abrahão, R., S. N. Moriguchi & D.-F. Andrade, (2016), "Intention of Adoption of Mobile Payment: An Analysis in the Light of the Unified Theory of Acceptance and Use of Technology (UTAUT)," *RAI Revista de Administração E Inovação*, 13(3): 221–230.

Akbar, F., (2013), "What Affects Students' Acceptance and Use of Technology? Carnegie Mellon University.

Awang, Z., (2015), *SEM Made Simple: A Gentle Approach to Learning Structural Equation Modeling. Selangor*, Kuala Lumpur: MPWS Rich Publication.

Awwad, M. S. & S. M. Al-Majali, (2015), "Electronic Library Services Acceptance and Use," *The Electronic Library*, 30(6): 1100–1120.

Baggozi, R. P. & Y. Yi, (1988), "On the Evaluation of Structural Equation Models," *Journal of the Academy of Marketing Science*, 16(1): 74–94.

Bhalalusesa, R., E. E. Lukwaro & M. Clemence, (2013), "Challenges of Using E-learning Management Systems faced by the Academic

Staff in Distance Based Institutions from Developing Countries: A Case Study of the Open University of Tanzania," *Huria Journal of OUT*, 14: 89–110.

Boomsma, A., (2000), "Reporting Analyses of Covariance Structures," *Structural Equation Modeling*, 7(3): 461–483.

Calder, B. J., L. W. Phillips & A. M. Tybout, (1981), "Designing Research for Application," *Journal of Consumer Research*, 8(2): 197–207.

Chauhan, S. & M. Jaiswal, (2016), "Determinants of acceptance of ERP Software Training in Business Schools: Empirical Investigation Using UTAUT Model," *The International Journal of Management Education*, 14(3): 248–262.

Chen, C., J. Wu & S. C. Yang, (2008), "Accelerating the Use of Weblogs as an Alternative Method to Deliver Case-based Learning," *International Journal on ELearning*, 7(2): 331.

Chen, H.-J., (2010), "Linking Employees' e-Learning System Use to Their Overall Job Outcomes: An Empirical Study Based on the IS Success Model," *Computers & Education*, 55(4): 1628–1639.

Chin, W., (1998), "The Partial Least Square Approach to Structural Equation Modeling," *Mordem Methods for Business Research*, 295(2), 295–336.

Clark, R. & R. Mayer, (2016), *E-learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning*, New Jersey: John Wiley & Sons.

Dacebo, (2017), "E-Learning Market Trends and Forecast 2017-2021. Retrieved from https:// www.docebo.com/elearning-market-trends-report- 2017-2021/?utm_campaign=2016 11 eLearning Market Trends Report&u tm_ medium =WP Download&utm_ source= PRWeb

Davis, D., (1989), "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly,* 319–340.

Dwivedi, Y. K., N. P. Rana, H. Chen & M. D. Williams, (2011), "A Meta-analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT)," In: IFIP International Working Conference on Governance and Sustainability in Information Systems-Managing the Transfer and Diffusion of IT (pp. 155–170), "Springer.

Elliot, M. & F. Fu, (2008), "Consumer Acceptance of Technology Products: The Impact of Tactical Selling Approaches. *Marketing Management Journal*, 18: 47–64.

Erdogmus, N. & M. Esen, (2011), "An Investigation of the effects of technology readiness on technology acceptance in e-HRM," *Procedia-Social and Behaviour al Sciences*, 24: 487–495.

Fornell, C. & D. F. Larcker, (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research*, 18(1), 39–50.

Greenbaum, J. & M. Kyng, (1991), *Design at Work: Cooperative Design of Computer Systems*, Lawrence Erlbaum Associates.

Hair, J. F., R. E. Anderson, R. L. Tatham & W. C. Black, (1998), *Multivariate Data Analysis* (5th ed.), Upper Saddle River, NJ: Prentice Hall.

Haron, H., W. F. Abbas & N. Rahman, (2012), "The Adoption of Blended Learning Among Malaysian Academicians," *Procedia-Social and Behaviour al Sciences*, 67, 175–181.

Hu, L. & P. M. Bentler, (1999), "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives," *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1): 1–55.

Karim, M. R. A. & Y. Hashim, (2004), "The Experience of the E-learning Implementation at the Universiti Pendidikan Sultan Idris, Malaysia," *Malaysian Online Journal of Instructional Technology (MOJIT)*, 1(1): 50–59.

Katz, Y. J., (2000), "The Comparative Suitability of three ICT Distance Learning Methodologies for College Level Instruction," *Educational Media International*, 37(1), 25–30.

Khechine, H., S. Lakhal, D. Pascot & A. Bytha, (2014), "UTAUT Model for Blended Learning: The Role of Gender and Age in the Intention to Use Webinars," *Interdisciplinary Journal of E-Learning and Learning Objects*, 10(1): 33–52.

Kibona, L. & G. Mgaya, (2015), "Smartphones' Effects on Academic Performance of Higher Learning Students," *Journal of Multidisciplinary Engineering Science and Technology*, 2(4): 777–784.

Kline, R. B., (2005), *Principles and Practice of Structural Equation Modeling* (2nd ed.), New York: Guilford Publications.

Lee, M.-C., (2010), "Explaining and Predicting Users' Continuance Intention Toward E-learning: An Extension of the Expectation–Confirmation Model" *Computers & Education*, 54(2): 506–516.

Lin, C., H. Shih & P. Sher, (2007), "Integrating Technology Readiness Into Technology Acceptance: The TRAM model," *Psychology & Marketing*, 24(7): 641–657.

Lin, C., H. Shih & P. Sher, (2007), "Integrating Technology Readiness into Technology Acceptance: The TRAM Model," *Psychology & Marketing*, 24(7): 641–657.

Lin, W. & C. Wang, (2012), "Antecedents to Continued Intention to Adopt E-Learning Systems in Blended Learning Instructions: A Contingency Framework Based on Models of Information Systems Success and Task Technology Fit," *Computers & Education,* 58(1): 88–99.

Lin, Y. & Jou, M., (2012), "A Web Application Supported Learning Environment for Enhancing Classroom Teaching and Learning Experiences," *Procedia-Social and Behavioural Sciences*, 64(1): 1–11.

Little, R. J. A., (1988), "A Test of Missing Completely at Random for Multivariate Data with Missing Values," *Journal of the American Statistical Association*, 83(404): 1198–1202.

Lubua, F., (2016), "Exploring the Opportunities for Integrating New Digital Technologies in Tanzania's Classrooms," *International Journal of Learning, Teaching and Educational Research*, 14(2): 131–150.

Lwoga, E., (2012), "Making Learning and Web 2.0 Technologies Work for Higher Learning Institutions in Africa," *Campus-Wide Information Systems*, 29(2): 90–107.

Lwoga, E. & M. Komba, (2015), "Antecedents of Continued Usage Intentions of Web-Based Learning Management System in Tanzania," *Education + Training*, 57(7): 738–756.

Mahenge, M. P. J. & C. Sanga, (2016), "ICT for e-learning in three higher education institutions in Tanzania," *Knowledge Management & E-Learning: An International Journal (KM&EL),* 8(1): 200–212.

Martins, C., Oliveira, T. & A. Popovi, (2014), "Understanding the Internet banking adoption: A Unified Theory of Acceptance and Use of Technology and Perceived Risk Application," *International Journal of Information Management*, 34(1): 1–13.

Millar, M. M. & Dillman, D., (2011), "Improve Response to Web and Mixed-mode Survey," *Public Opinion Quartely*, 75(2): 249–269.

Mossholder, K. W., N. Bennett, E. R. Kemery & M. A. Wesolowski, (1998), "Relationships Between Bases of Power and Work Reactions: The Mediational Role of Procedural Justice," *Journal of Management*, 24(4): 533–552.

Mtebe, J. S. & R. Raisamo, (2014a), "Investigating Students' Behavioural Intention to Adopt and Use Mobile Learning in Higher Education in East Africa," *International Journal of Education and Development Using Information and Communication Technology*, 10(3): 4–20.

Mtebe, J. S. & R. Raisamo, (2014b), "Investigating Students' Behavioural Intention to Adopt and Use Mobile Learning in Higher EEducation in East Africa," *International Journal of Education and Development Using Information and Communication Technology*, 10(3): 4–20.

Mtega, W., R. Bernard, A. C. Msungu & R. Sanare, (2013), "Using Mobile Phones for Teaching and Learning Purposes in Higher Learning Institutions? The Case of Sokoine University of Agriculture in Tanzania," *Proceedings and Report of the 5th Ubuntu Net Alliance Annual Conference*, 2223(7062): 118–129.

Njoroge, C. N. & D. Koloseni, (2015), "Adoption of Social Media as Full-Fledged Banking Channel? An Analysis of Retail Banking Customers in Kenya," International Journal of Information and Communication Technology Research, 5(9).

Nunnally, J., (1978), *Psychometric Methods*. New York: McGraw-Hill.

Olatubosun, O., F. A. Olusoga & O. A. Samuel, (2015), "Adoption of eLearning Technology in Nigerian Tertiary Institution of Learning," *British Journal of Applied Science & Technology*, 10(2): 1–15.

Oye, N. D., N. A. Iahad & N. A. Rahim, (2014), "The History of UTAUT Model and its Impact on ICT Acceptance and Usage by Academicians," *Education and Information Technologies*, 19(1): 251–270.

Parasuraman, A., (2000), "Technology Readiness Index (TRI) A Multiple-Item Scale to Measure Readiness To Embrace New Technologies," *Journal of Service Research*, 2(4): 307–320.

Parasuraman, A., (2000), "Technology Readiness Index (TRI) A Multiple-Item Scale to Measure Readiness To Embrace New Technologies," *Journal of Service Research*, 2(4): 307–320.

Parasuraman, A. & Colby, C. L., (2007), *Techno-Ready Marketing: How and Why Your Customers Adopt Technology,* New York, USA: The Free Press.

Roca, J. C., C.-M. Chiu & F. J. Martínez, (2006), "Understanding E-learning Continuance Intention: An Extension of the Technology Acceptance Model," *International Journal of Human-Computer Studies*, 64(8): 683–696.

Rumanyika, J. D. & R. Mashenene, (2015), "Challenges for Teaching and Learning Information and Communication Technology Courses in Higher Learning Institutions in Tanzania?" *African Review*, 5(2): 1–13.

Seddon, P. B., (1997), "A Respecification and Extension of the DeLone and McLean Model of IS Success," *Information Systems Research*, 8(3): 240–253.

Sedoyeka, E. & G. Gafufen, (2013), "Computers in Tanzania Secondary Schools-Challenges and Opportunities," *International Journal of Computing & ICT Research*, 7(1): 22–32.

Shin, S. & W. Lee, (2014), "The Effects of Technology Readiness and Technology Acceptance on NFC Mobile Payment Services in Korea," *Journal of Applied Business Research*, 30(6): 1615.

Shoniregun, C. A. & S.-J.Gray, (2003), "Is E-learning Really the Future or a Risk?" *Ubiquity*, 2003 (April), 1-1.

Sife, A., E. Lwoga & C. Sanga, (2007), "New Technologies for Teaching and Learning: Challenges for Higher Learning Institutions in Developing Countries," *International Journal of Education and Development Using ICT*, 3(2).

Sophonthummapharn: K. & G. Tesar, (2007), "Technology Readiness and Propensity of Cell Phone Users to Subscribe to Commercial Messaging Services," *Marketing Management Journal*, 17(2): 81–95.

Sumak, B., G. Polancic & M. Hericko, (2010), "An Empirical Study of Virtual Learning Environment Adoption Using UTAUT. In *Mobile, Hybrid, and On-Line Learning*, 2010. ELML'10. Second International Conference on (pp. 17–22), IEEE.

Šumak, B. & A. Šorgo, (2016), "The acceptance and Use of Interactive Whiteboards Among Teachers: Differences in UTAUT Determinants Between Pre- and Post-Adopters," *Computers in Human Behaviour*, 64: 602–620.

Triandis, H. C., (1979), "Values, Attitudes, and Interpersonal Behaviour," In Nebraska Symposium on Motivation. Nebraska: University of Nebraska Press.

Tsikriktsis, N., (2004), "A Technology Readiness-Based Taxonomy of Customers: A Replication and Extension," *Journal of Service Research*, 7(1): 42–52.

United Republic of Tanzania (URT), (2010), *Secondary Education Development Programme II.* Dar es Salaam, Tanzania.

Venkatesh, V., M. Morris, G. Davis & F. Davis, (2003), "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, 27(3): 425–478.

Walczuch, R., J. Lemmink & S. Streukens, (2007), "The Effect of Service Employees' Technology Readiness on Technology Acceptance," *Information and Management*, 44(2): 206–215.