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# Role of IT Culture in Learners' Acceptance of E-Learning

James Wairimu
*The University of Texas Rio Grande Valley*

Susan Githua

Kenneth Kungu

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# Chapter 18
# Role of IT Culture in Learners' Acceptance of E-Learning

**James Wairimu**
*University of Texas – Rio Grande Valley, USA*

**Susan Githua**
*Tennessee State University, USA*

**Kenneth Kungu**
*Clayton State University, USA*

## ABSTRACT

*This chapter sought to explore factors that influence e-learning adoption and use among students in higher education in Kenya. Based on UTAUT model, the study proposes that performance expectancy, effort expectancy, social influence, and facilitating conditions will influence intention to use e-learning. Additionally, the role of IT culture is explored. Performance expectancy, social influence, facilitating conditions, and IT culture were significant in predicting intention to use e-learning. Intention to use significantly predicted usage. Implications for higher education are discussed.*

## INTRODUCTION

The continued advancement in information and communication technologies (ICT) is transforming human experiences in various sectors including education through e-learning, a mode of education delivery that does not require physical classrooms. Two modes of e-learning exist in form of, asynchronous e-learning, where students log into e-learning platforms at their own convenience to access educational materials or participate in discussion boards, and synchronous e-learning that entails students using real-time technology such as video-conferencing to participate in classroom activities (Hrastinski, 2008). Both forms of e-learning provide several advantages to learners including; convenient access to education, efficient content delivery, and meeting the growing demand for education (Bhuasiri, Xaymoungkhoun, Zo, Rho, & Ciganek, 2012; Guan, Ding, & Ho, 2015). Therefore, e-learning provides the advantage of

education access to every citizen, a goal of almost all countries in the world. It is therefore important for both researchers and practitioners to determine ways of improving e-learning technologies for successful education delivery to leaners.

Findings from e-learning studies attribute e-learning success to several factors including information technology (IT) infrastructure (Hameed, Shaikh, Hameed, & Shamim, 2016), and the extent to which an e-learning system addresses the educational needs of learners (Lee, Yoon, & Lee, 2009). Technology adoption studies emphasize on the importance of user perceptions in comfort and ease of use as factors that influence for successful technology utilization (Venkatesh, Morris, Davis, & Davis, 2003). Therefore, user acceptance of e-learning stands as a major factor in determining the success of e-learning to users. However, literature is scarce on e-learning primary users' perceptions on their interaction with e-learning technologies, especially in the developing world context. Much attention is focused on the state of IT infrastructure in supporting e-learning activities. However findings from United Nations Research Institute for Social Development (UNRISD) show that countries are increasingly investing in technological infrastructure for sustainable development (Dugarova & Gülasan, 2017), hence infrastructure is becoming less of an inhibiting factor towards e-learning use in developing countries. Technology adoption studies have explicated other factors that influence technology use, primarily culture. According to Leidner & Kayworth, (2006), culture is a complex term that involves multiple definitions and contexts, and hence needs to be carefully investigated on its role in technology use and acceptance. Findings on the role of culture in e-learning acceptance are, however, not conclusive given the varying cultural practices in different countries. Moreover, the influence of culture on e-learning has been extensively studied in the context of natural culture based on Hofstede, (1984) cultural dimensions. As submitted by Leidner & Kayworth, (2006), culture is a diverse term that needs further exploration.

Culture can be conceptualized as a way of living. It is implied that technology influences culture by shaping how people undertake daily activities, for example; online shopping as opposed to visiting a store, or visiting places based on internet recommendations (Gilkey, 2015). Therefore, it is arguable that the practice of utilizing technology in daily activities turns to habits that are embedded in individuals' culture. Using this conceptualization, we define IT culture as the extent to which individuals are accustomed to routine technology use in everyday activities such as banking, bill payments, and communication.

There are studies that explore how IT culture is transforming individual experiences in shopping, or tourism, but little is known about how IT culture shapes individuals' e-learning experiences. It is plausible that technology experience is important for acceptance and use of technologies (Venkatesh et al., 2003). The objective of this study is to investigate the role of IT culture in e-leaning acceptance and use.

This study is focused on investigating the factors that influence use of e-learning in a Kenyan higher education setting. Kenya is increasingly characterized as a country with vibrant technology infrastructure and high internet penetration. According to Internet World Stats Website, (2019), Kenya ranks highest (85%) in internet penetration in Africa as of the year 2018. Also, Kenya stands as a ready market for e-learning technologies given the growing demand for university education. As of the year 2016, there has been over 100% increase in university enrolment in Kenya (Mukhwana, 2016). However, studies on e-learning in Kenya have focused more on policy makers and IT infrastructure development. This study seeks to understand acceptance and use from the perspective of learners.

The aim of this study is to explore factors that influence e-learning adoption and use among students in higher education in Kenya. The contributes to the literature by testing the unified theory of acceptance and use of technology (UTAUT) in a new context, and introduces IT culture as a new variable in the model.

In the following sections, we provide a brief review of relevant literature. We then introduce the theoretical framework and formulate our hypothesis. Lastly, we discuss the methods, results, discussions and limitations.

## BACKGROUND

### E-Learning in Developing Countries

Several studies have been conducted in developing countries regarding e-learning adoption and use. In an exploration of critical success factors that influence e-learning, Bhuasiri et al., (2012) identified factors such as; curriculum design, learners' behaviors, and technology awareness as all influential in e-learning success. A similar study about critical factors was carried out in Pakistan where similar issues were identified. In addition, other factors such as; e-learning software quality, local language translation, and design were other critical success factors identified (Farid et al., 2015).

In a review of e-learning challenges in both developing and developed countries, user perceptions in both categories stood out, whereas factors including; government funding support, tutors' training, and ICT infrastructure affected the developing countries more (Naresh & Reddy, 2015). In a recent study that assessed e-learning success in Nigeria, service quality of the e-learning technology influenced user satisfaction but not use intentions, whereas system quality influenced intention but not satisfaction (Yakubu & Dasuki, 2018). This draws a contrast between use and satisfaction where, intention to use the e-learning is more influenced by how users perceive an e-learning systems ability to deliver learning benefits. This finding is consistent to that of Kim & Park, (2018) where, performance expectation was influential in users' e-learning use intentions. These studies report consistent findings in terms of individual and technological factors that influence e-learning use. However, some of the findings are based on a particular e-learning technology (e.g. Yakubu & Dasuki, 2018)), whereas the others (e.g. Boateng, Mbrokoh, Boateng, Senyo, & Ansong, 2016; Tarhini, Hone, & Liu, 2014)) rely on less powerful theories as compared to UTAUT in predicting e-learning adoption.

A recent study i.e. (Masa'deh, Tarhini, Bany Mohammed, & Maqableh, 2016) successfully used UTAUT model to predict learners' e-learning use intentions. However, the study was based in Lebanon, hence it would be important to replicate the same in a different developing country to compare results for reliability. Findings from this study are helpful to education stakeholders in understanding factors that influence learners' adoption of e-learning technologies in developing countries and design strategies to implement e-learning.

### Research Model Development

Prior e-learning adoption studies have extensively used Technology Acceptance Model (TAM) to discern factors that influence e-learning acceptance and use. In a meta-analysis of e-learning technology acceptance, Šumak et al., (2011) reported that 86% of the studies investigated used TAM as the main model for understanding e-learning acceptance. Such extensive use of TAM has led to the development

of many external factors that try to explain e-learning acceptance (Abdullah & Ward, 2016). Findings from these studies extensively report that perceived usefulness and ease of use as major influences of learner's acceptance of e-learning technologies (Šumak et al., 2011). According to (Venkatesh et al., 2003) TAM may not reflect all factors that may influence users' technology adoption, hence, Unified Theory of Acceptance and Use of Technology (UTAUT) was introduced. UTAUT incorporates eight other theories (Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Theory of Planned Behavior (TPB), Motivational Model (MM), Combined TAM and TAB (C-TAM-TPB), Model of PC Utilization (MPCU), Social Cognitive Theory (SCT) and Innovation Diffusion Theory (IDT)) including TAM and has been successfully used to measure users' attitudes and intentions to use a technology. UTAUT was found to be more effective in predicting users' intentions to adopt technologies as compared to these eight theories (Venkatesh et al., 2003).

UTAUT has been reported to have varied findings depending on the context of technology adoption. For example, a study by (Im, Hong, & Kang, 2011) that employs UTAUT to compare technology adoption between the United States and Syria reported several differences that influence behavior intentions. UTAUT has been utilized in discerning e-learning adoption in several countries, and this study seeks to replicate the same in the Kenyan context.

We seek to understand determinants of success of e-learning technologies. Specifically, we employ IT culture in the UTAUT model to predict successful use of e-learning technologies.

## Hypotheses

### IT Culture

Multiple definitions of culture exist including; myths, ideologies, norms, observable artifacts, practices, among others. However, a unifying factor for all descriptions of culture its exclusiveness, making a group of people to be distinct. Culture represents belief that individuals have towards human behavior and way of living (Leidner & Kayworth, 2006). Culture influences individual behavior in different contexts including information technology (IT) adoption. In fact, it is posited that culture and IT share endogenous relationship as culture influences technology whereas technology influences culture as well (Gilkey, 2015). Culture influences IT in several ways including technology acceptance (Al-Gahtani, Hubona, & Wang, 2007; McCoy, Galletta, & King, 2007), and IT design to conform to cultural standards (Kinasevych, 2010). IT on the other hand influences culture in several ways including communication, from the use of traditional newspapers to the internet through; online blogging, video blogging, and social media (Gilkey, 2015). The phenomenon presented shows that IT and culture are embedded in societal norms, thus, IT culture.

We propose that the IT culture possessed by a society is likely to influence their acceptance and use of e-learning. For example, in Kenya, individuals exhibit IT culture when it comes to monetary transactions through mobile phones with 66% of the population using mobile money transfer services of M-Pesa (Donkin, 2016). Also, Kenya is among the countries that rank high in internet penetration and online presence across Africa. Therefore, this IT culture is likely to positively influence the acceptance and use of e-learning technology.

H1: IT culture has a positive relationship with student's intentions of e-learning use.

## Social Influence

This sums the extent to which individuals perceive that people who influence their behavior would support their use of a technology (Venkatesh et al., 2003). Notwithstanding it's significant influence to use a technology under mandatory environments as posited by Venkatesh & Davis, (2000), social influence also affects individuals' intentions to adopt technologies under voluntary environments. For example, in the Kenyan context, users are socially influenced to adopt technologies such as; health management (Karuri, Waiganjo, & Orwa, 2017), Information and Communication Technologies for research (Muriithi, Horner, & Pemberton, 2016). We also posit that individuals such as teachers, and peers' views would positively influence students' intentions towards e-learning use.

Hypothesis 2: Social influence will positively influence students' intentions towards e-learning use.

## Performance Expectancy

This is the extent to which individuals perception that using a particular technology enhances their job performance (Venkatesh et al., 2003). A technology should thus help users gain efficiency in their tasks when using a technology as compared to the traditional means. In the e-learning context, performance expectancy is described as the perception that using an e-learning tool shall help a student in expanding their knowledge (Gitau & Omwenga, 2016). Significant findings have been reported in prior studies where, performance expectancy influences adoption of Web 2.0 e-learning tools such as YouTube and blogs among students and staff in Kenyan universities (Gitau & Omwenga, 2016).While such findings are based on open source platforms such as blogs and YouTube video tutorials, it would be interesting to discern if the same is replicated in e-learning tools designed for universities. This leads to our second hypothesis that suggests;

Hypothesis 3: Performance expectancy will positively influence students' intentions towards e-learning use.

## Effort Expectancy

This is the degree that a system is easy to use (Venkatesh et al., 2003). The effort that a user is expected to exert to use a technology influences their decision to adopt the technology. This is significant in the Kenyan context in terms of users intentions of health technology adoption (Karuri et al., 2017). According to Venkatesh et al., (2003), like other UTAUT constructs, effort expectancy influences use behavior in both voluntary and non-voluntary environment. This construct has also been explored in TAM as 'ease of use' and found to influence individuals' attitudes and behavioral intentions. In development of an extended TAM for e-learning, perceived ease of use was found as a positive influencer of individuals' attitudes towards e-learning adoption (Abdullah & Ward, 2016), as well as in e-learning adoption comparison between western and eastern cultures (Al-Jumeily & Hussain, 2014). In the UTAUT perspective, we theorize that students' intentions to adopt e-learning technologies shall be positively influenced by the less effort that is required from them to use them.

Hypothesis 4: Effort expectancy will positively influence students' e-learning intentions

## Facilitating Conditions

This is defined as an individual's perception that an organization or institution has the necessary capabilities to support a technology (Venkatesh et al., 2003). It is expected that the presence of tutorials on a new technology increases users' intention to adopt a technology. This was however not supported in Venkatesh et al., (2003) arguments, where results were not significant. Similar findings were also reported in a mobile learning technology adoption study in Guyana, where users' intentions were not influenced by facilitating conditions (Thomas, Singh, & Gaffar, 2013). However, respondents from a mobile banking adoption study indicated that the availability of facilitating conditions such as compatibility, knowledge, and other resources were influential in their intentions (Baptista & Oliveira, 2015). These results depict an inconsistent pattern that may be attributed to the type of technology, as well as the technology environment. In Kenya, the technology environment is growing, and most people are utilizing mobile payment technologies. Organizations that provide these services are readily proving support and educational materials through TV advertisements that makes it easier for individuals to use these mobile payment technologies. We thus predict that the technology infrastructure laid out by the learning institution such as computer labs, and availability of technical support will lead to high intentions of adopting e-learning technologies. We also propose that intentions lead to actual usage as reported in prior technology adoption studies.

Hypothesis 5: Facilitating conditions will positively influence students' intentions of e-learning use.
Hypothesis 6: Intentions towards e-learning use leads actual e-learning use.

## METHOD

### Participants and Data Collection

We conducted a survey where participants were recruited from different universities in Kenya. Participants were asked to fill an online likert-scale survey with measurements adopted from prior studies (See Appendix). We conceptualize IT culture as individuals' media technology usage attitudes (MTUA) developed and tested by Rosen, Whaling, Carrier, Cheever, & Rokkum, (2013).

We received a total of 115 respondents, whom 63 were male and 49 were female, whereas the rest chose not to disclose their gender. The respondents had a median age of 25 years. 75% had home internet access, whereas 78% owned a laptop computer, and 34% owned a tablet. Majority (98%) of the respondents own a smartphone. 77% of the respondents had a full-time job.

A wordcloud generated from students' responses shows that most of the students were pursuing a bachelor's degree, and some of the major courses pursued by majority include; science, arts, technology, and management.

## ANALYSIS AND RESULTS

We performed confirmatory factor analysis to validate our measurement model. Results confirm instrument reliability as composite reliability (CR) values for all factors were above the 0.7 cut-off value (Hair, Sarstedt, Ringle, & Mena, 2012) . Convergent validity was also confirmed as the average variance explained (AVE) for all constructs were above the satisfactory threshold of 0.5, (Hair et al., 2012).

Divergent validity is also confirmed as the square root of AVE for all constructs were above 0.7 threshold.

After validation of the constructs and measurements, we perform structural equation modelling (SEM) using SmartPLS3 (Ringle, Wende, & Becker, 2015) for hypothesis testing. Findings from the structural model analysis show that IT culture positively influence e-learning use intentions (*p < 0.05; t= 2.614; β= 0.192*), supporting H1. Hypothesis 2 was also supported, where social influence positively influences individual e-learning use intentions *(p < 0.05; t= 3.115; β= 0.26).* The positive relation between performance expectancy and e-learning use intentions was also significant (*p < 0.05; t= 6.006; β= 0.491*), supporting H3. Effort expectancy was found to be negatively related to e-learning use intentions as hypothesized (*β=- 0.047*) but this relationship was not statistically significant (*p > 0.05; t= 0.842*), thus, H4 was not supported. This is not surprising as most of the participants had experience with technology as most owned laptop computers and smartphones. However, the positive relationship between facilitating conditions was significant (*p < 0.05; t= 2.206; β= 0.608*), supporting H5. And finally, use intention was positively related to actual use and was significant (*p < 0.05; t= 11.41; β= 0.608*), supporting H6.

## DISCUSSION AND IMPLICATIONS

This study sought to explore factors that influence e-learning adoption and use among students in higher education in Kenya. Based on the unified theory of acceptance and use of technology (UTAUT), the study proposes that performance expectancy, effort expectancy, social influence and facilitating conditions will influence intention to use e-learning. The study extends UTAUT theory by including an additional variable, IT culture, in the model. Lastly, the study proposes that intentions to use e-learning leads actual e-learning use.

### Performance Expectancy

Performance expectancy had a positive relationship with intention to use e-learning. Performance expectancy refers to the degree to which users believe the system will help them attain gains in performance (Venkatesh et al., 2003). Of all the five variables, performance expectancy was the strongest predictor of intentions to use e-learning. This is consistent with previous studies that have found performance expectancy to be a significant predictor of behavioral intentions to use various forms of IT including e-learning and mobile learning (Masa'deh, et al., 2016; Mbete & Raisamo, 2014; Thomas, Singh, & Gaffar, 2013; Venkatesh et al., 2003). Two meta-analyses found a consistent positive association between performance expectancy and behavioral intentions (Taiwo & Downe, 2013; Dwivedi, Rana, Chen &Williams, 2011).

The implication of this finding is that surveyed students are more likely to use e-learning if they believe that it is useful and will help them attain performance that they value. In higher education settings outcomes such as learning more efficiently, improving learning performance, and obtaining better grades could motivate students (Mbete & Raisamo, 2014). Some suggestions on improving performance expectancy include designing systems that will enable students complete learning tasks quickly (Taiwo & Downe, 2013); providing sufficient and up-to-date content that meets user needs (Wang, Wu &Wang, 2009); and developing tools that will facilitate learning (Mbete & Raisamo, 2014). Developing e-learning with those features is likely to increase perceived usefulness of the system among students leading to adoption and use.

## Effort Expectancy

Effort expectancy was not found to be a significant predictor of intention to use e-learning. Effort expectancy refers to expected ease of use of e-learning systems. The results from this study differs from previous research in two regards: the relationship between effort expectancy and intention to use was negative, and not significant. Some meta-analyses have found a consistent positive association between effort expectancy and behavioral intentions (Taiwo & Downe, 2013; Dwivedi, Rana, Chen &Williams, 2011). One possible explanation of this outcome could be sample we surveyed. We collected the data through an online survey, and it is possible that the survey targeted students who are computer savvy and thus may not view e-learning systems as complex. Thus, ease of use may not be a factor for such a population.

Regardless of this finding, it is recommended that designer should create e-learning systems that are easy to use. E-learning systems that do not require too much effort on the part of the students to complete learning tasks are more likely to be adopted and used. For instance, e-learning systems should have easy to navigate web interfaces (Taiwo & Downe, 2013) and allow for access to material remotely and on mobile devices (Muriithi, Horner, & Pemberton, 2016). In addition, colleges should offer training on how to use the e-learning system to students to increase their skill in using the system and thus influence their perceptions of ease of use. Students are more likely to adopt and use e-learning systems they perceive to be user friendly and easy to use.

## Social Influence

Social influence had a positive relationship with intentions to use e-learning; the second strongest predictor. Other studies had found a positive relationship between the two variables, even though in most studies, this relationship was weak (Dwivedi et al., 2011; Masa'deh, et al., 2016; Taiwo & Downe, 2013; Venkatesh et al., 2003). It appears that in this context, social influence is an important variable in determining adoption and use of e-learning.

Social influence refers to the degree referent others believe one should use the new system (Venkatesh et al., 2003). In promoting the use of e-learning systems, universities should consider using instructors, student leaders and peers to encourage other students to use the system. Mbete and Raisamo (2014) suggest offering training and awareness to early adopters as a way of influencing others to follow. Muriithi, Horner and Pemberton (2014) suggest making use of ICT mandatory in some university processes the effects of which would translate to more people considering using e-learning. The role of important others in influencing adoption and use should be incorporated in all e-learning enrollment campaigns.

## Facilitating Conditions

Facilitating conditions significantly predicted increased intention to use e-learning. Facilitating conditions refers to the degree to which an individual believes that there is sufficient organizational and technical infrastructure to support use of the system (Venkatesh et al., 2003). Past research on this relationship has yielded mixed findings. For instance, the meta-analysis by Dwivedi et al. (2011) found a consistent positive relationship between facilitating conditions and behavioral intentions. Taiwo and Downe's (2013) meta-analysis could not conclusively reach that determination. However, Thomas, Singh, & Gaffar (2013) found that facilitating conditions do influence behavioral intentions to use mobile learning in a developing world context.

Thus, we can suggest that in this context, it is important for students to perceive that universities have necessary organizational and technical infrastructure to support e-learning. Universities should pay attention to such factors as providing reliable internet connectivity, power back up plans, and adequate technical support (Muriithi, Horner, & Pemberton, 2016). The e-learning ecosystem should be designed to remove barriers to use (Venkatesh et al., 2003). Institutions of higher learning in Kenya should expend more resources in developing organizational and technical infrastructure.

## IT Culture

IT culture was a significant predictor of increased intention to use e-learning. IT culture in this study is conceptualized as the extent to which individuals are accustomed to routine technology use in everyday activities. It was anticipated that in a country like Kenya that has one of the highest internet penetration rates in Africa, and one in which mobile money is ubiquitous, every day technology use would spillover and influence intention to use e-learning. Just like Venkatesh et al., (2003) suggested, technology experience can influence acceptance and use of other technologies.

In this context, it has emerged that the extent to which one uses technology in regular, day-to-day activities does positively influence intention to use e-learning. Universities should consider building on the existing IT culture to influence intention and usage of e-learning. Muriithi, Horner, & Pemberton (2016) suggests using ICT for wider university processes such as communication and documentation could promote a culture in which IT use is common place. This means jettisoning hard copies for most processes. Other possible suggestions would be to build e-learning systems that are compatible with mobile access, as the existing IT culture is largely mobile phone-based.

## E-Learning Use

Intentions towards e-learning use was positively related to e-learning use. A meta-analysis by Dwivedi (2011) found a consistent positive relationship between behavioral intentions and usage.

To increase e-learning use, higher education institutions in Kenya should increase performance expectancy, effort expectancy, and work on social influence, IT culture, and facilitating conditions. The will influence intention to use e-learning and ultimately increase use of e-learning.

## LIMITATIONS

This study has several limitations. The data used in this study was collected at single point in time from a convenience sample. The cross-sectional nature of the data and the non-random sample do limit the generalizability of the results of this study. The key variables in this study were studies using single source, self-report and perception measures. Future studies should incorporate more objective measures especially for a variable like e-learning usage. Lastly, this study did omit some key moderating variables suggested by Venkatesh et al. (2003) among others such as age and gender. This reduced the explanatory power of the model we have used in this study.

## REFERENCES

Abdullah, F., & Ward, R. (2016). Developing a General Extended Technology Acceptance Model for E-Learning (GETAMEL) by analysing commonly used external factors. *Computers in Human Behavior*, *56*, 238–256. doi:10.1016/j.chb.2015.11.036

Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, *44*(8), 681–691. doi:10.1016/j.im.2007.09.002

Al-Jumeily, D., & Hussain, A. (2014). The impact of cultural factors on technology acceptance: A technology acceptance model across eastern and western cultures. *International Journal of Enhanced Research in Educational Development*, *4*(2), 37–62.

Baptista, G., & Oliveira, T. (2015). Understanding mobile banking: The unified theory of acceptance and use of technology combined with cultural moderators. *Computers in Human Behavior*, *50*, 418–430. doi:10.1016/j.chb.2015.04.024

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education*, *58*(2), 843–855. doi:10.1016/j.compedu.2011.10.010

Boateng, R., Mbrokoh, A. S., Boateng, L., Senyo, P. K., & Ansong, E. (2016). Determinants of e-learning adoption among students of developing countries. *International Journal of Information and Learning Technology*, *33*(4), 248–262. doi:10.1108/IJILT-02-2016-0008

Donkin, C. (2016). *M-Pesa continues to dominate Kenyan market - Mobile World Live*. Retrieved April 6, 2019, from https://www.mobileworldlive.com/money/analysis-money/m-pesa-continues-to-dominate-kenyan-market/

Dugarova, E., & Gülasan, N. (2017). *Global Trends: Challenges and Opportunities in the Implementation of the Sustainable Development Goals*. Academic Press.

Farid, S., Ahmad, R., Niaz, I. A., Arif, M., Shamshirband, S., & Khattak, M. D. (2015). Identification and prioritization of critical issues for the promotion of e-learning in Pakistan. *Computers in Human Behavior*, *51*, 161–171. doi:10.1016/j.chb.2015.04.037

Gilkey, C. (2015). *Technology and Culture Influence Each Other - Productive Flourishing*. Retrieved April 6, 2019, from https://www.productiveflourishing.com/technology-and-culture-influence-each-other/

Gitau, M., & Omwenga, E. I. (2016). Application of the UTAUT Model to Understand Factors Influencing the use of Web 2.0 Tools in e-learning in Kenyan Public Universities. *Journal of Emerging Trends in Computing and Information Sciences*, *7*(7).

Guan, C., Ding, D., & Ho, K. W. (2015). E-Learning in Higher Education for Adult Learners in Singapore. *International Journal of Information and Education Technology (IJIET)*, *5*(5), 348–353. doi:10.7763/IJIET.2015.V5.528

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science*, *40*(3), 414–433. doi:10.100711747-011-0261-6

Hameed, N., Shaikh, M. U., Hameed, F., & Shamim, A. (2016). *Cultural Differences in E-Learning: Exploring New Dimensions.* ArXiv Preprint ArXiv, 6.

Hofstede, G. (1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, *1*(2), 81–99. doi:10.1007/BF01733682

Hrastinski, S. (2008). Asynchronous and Synchronous E-Learning. *EDUCAUSE Quarterly*, *31*(4), 51–55.

Im, I., Hong, S., & Kang, M. S. (2011). An international comparison of technology adoption. *Information & Management*, *48*(1), 1–8. doi:10.1016/j.im.2010.09.001

Internet World Stats Website. (2019). *Internet Penetration in Africa*. Retrieved April 6, 2019, from Internet World Stats Usage and Population Statistics website: https://www.internetworldstats.com/stats1.htm

Karuri, J., Waiganjo, P., & Orwa, D. (2017). Determinants of Acceptance and Use of DHIS2 in Kenya: UTAUT-Based Model. *Journal of Health Informatics in Developing Countries*, *11*, 22.

Kim, B., & Park, M. J. (2018). Effect of personal factors to use ICTs on e-learning adoption: Comparison between learner and instructor in developing countries. *Information Technology for Development*, *24*(4), 706–732. doi:10.1080/02681102.2017.1312244

Kinasevych, O. (2010). The effect of culture on online learning. In Proceedings Cultural Attitudes Towards Communication and Technology, (pp. 420–427). Murdoch University.

Lee, B.-C., Yoon, J.-O., & Lee, I. (2009). Learners' acceptance of e-learning in South Korea: Theories and results. *Computers & Education*, *53*(4), 1320–1329. doi:10.1016/j.compedu.2009.06.014

Leidner & Kayworth. (2006). Review: A Review of Culture in Information Systems Research: Toward a Theory of Information Technology Culture Conflict. *MIS Quarterly, 30*(2), 357. doi:10.2307/25148735

Masa'deh, R., Tarhini, A., Bany Mohammed, A., & Maqableh, M. (2016). Modeling Factors Affecting Student's Usage Behaviour of E-Learning Systems in Lebanon. *International Journal of Business and Management*, *11*(2), 299. doi:10.5539/ijbm.v11n2p299

McCoy, S., Galletta, D. F., & King, W. R. (2007). Applying TAM across cultures: The need for caution. *European Journal of Information Systems*, *16*(1), 81–90. doi:10.1057/palgrave.ejis.3000659

Mukhwana, E. J. (2016). *State of university education in Kenya*. Nairobi, Kenya: Commission for University Education.

Muriithi, P., Horner, D., & Pemberton, L. (2016). Factors contributing to adoption and use of information and communication technologies within research collaborations in Kenya. *Information Technology for Development, 22*(sup1), 84–100. doi:10.1080/02681102.2015.1121856

Naresh, B., & Reddy, B. S. (2015). Challenges and opportunity of E-learning in developed and developing countries-a review. *International Journal of Emerging Research in Management and Technology*, *4*(6), 2278–9359.

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). *SmartPLS 3.* Boenningstedt: SmartPLS GmbH. Retrieved from http://www. smartpls. com

Rosen, L. D., Whaling, K., Carrier, L. M., Cheever, N. A., & Rokkum, J. (2013). The Media and Technology Usage and Attitudes Scale: An empirical investigation. *Computers in Human Behavior*, *29*(6), 2501–2511. doi:10.1016/j.chb.2013.06.006 PMID:25722534

Šumak, B., Heričko, M., & Pušnik, M. (2011). A meta-analysis of e-learning technology acceptance: The role of user types and e-learning technology types. *Computers in Human Behavior*, *27*(6), 2067–2077. doi:10.1016/j.chb.2011.08.005

Tarhini, A., Hone, K., & Liu, X. (2014). The effects of individual differences on e-learning users' behaviour in developing countries: A structural equation model. *Computers in Human Behavior*, *41*, 153–163. doi:10.1016/j.chb.2014.09.020

Thomas, T. D., Singh, L., & Gaffar, K. (2013). The utility of the UTAUT model in explaining mobile learning adoption in higher education in Guyana. *International Journal of Education and Development Using ICT*, *9*(3), 17.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Quarterly*, *27*(3), 425–478. doi:10.2307/30036540

Yakubu, M. N., & Dasuki, S. (2018). Assessing eLearning Systems Success in Nigeria: An Application of the DeLone and McLean Information Systems Success Model. *Journal of Information Technology Education: Research*, *17*, 183–203. doi:10.28945/4077

## KEY TERMS AND DEFINITIONS

**E-Learning:** Individuals access to educational materials over technology mediated mediums.

**E-Learning Acceptance:** Individuals' willingness to use e-learning technologies.

**Effort Expectancy:** Perceptions of the degree of strain required to operate e-learning technologies.

**Facilitating Conditions:** The extent to which an e-learning user perceives adequacy in facilities and environment for e-learning activities.

**IT Culture:** Behaviors and habits of engaging in technology mediated activities.

**Performance Expectancy:** The degree to which e-learning technology perform according to users' expectations.

**Social Influence:** The extent to which individuals are persuaded to use e-learning based on peer influence.

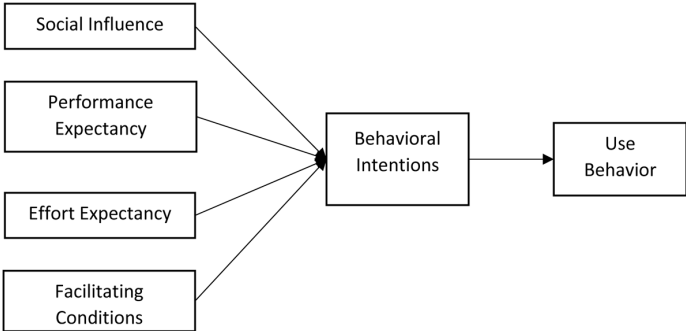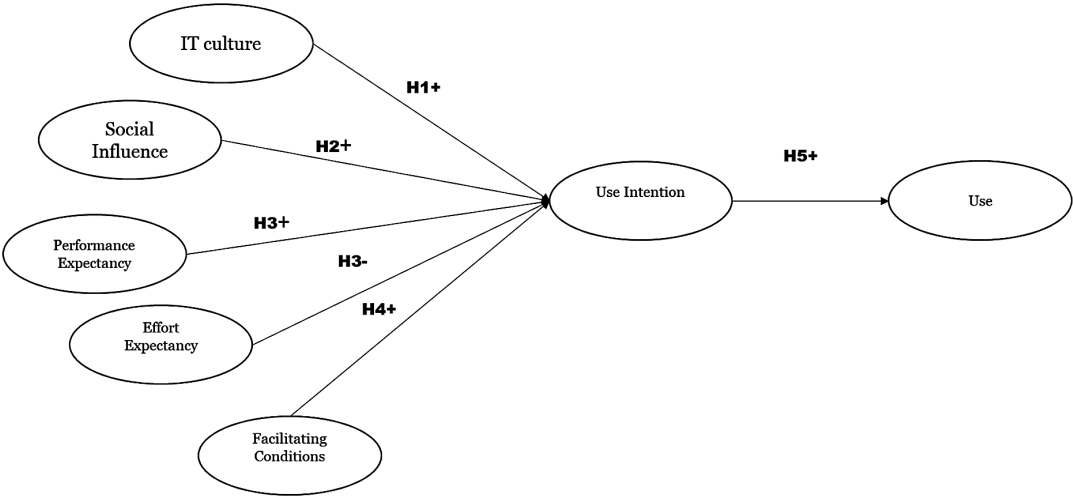## APPENDIX

*Figure 1. Original UTAUT Model*



*Figure 2. Extended UTAUT Model*

*Figure 3. Wordcloud of students' majors*



*Figure 4.*

*Table 1. Convergent and Discriminant Validity*

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1.Effort Expectancy CR= 0.897 | **0.862** | | | | | | |
| 2.Facilitating Conditions CR= 0.887 | 0.474 | **0.851** | | | | | |
| 3.MTUA CR= 0.899 | 0.171 | 0.328 | **0.802** | | | | |
| 4.Performance Expectancy CR= 0.877 | 0.377 | 0.270 | 0.178 | **0.777** | | | |
| 5.Social Influence CR= 0.809 | 0.124 | 0.305 | 0.050 | 0.294 | **0.770** | | |
| 6. Use Behavior CR= 0.867 | 0.246 | 0.477 | 0.118 | 0.401 | 0.420 | **0.827** | |
| 7. Use Intentions CR= 0.893 | 0.260 | 0.417 | 0.337 | 0.622 | 0.459 | 0.608 | **0.823** |
| Note: Diagonals contains square root of AVE, off diagonals contains interfactor Correlation, CR=Composite Reliability | | | | | | | |

*Table 2.*

|  | Hypothesis | Supported |
|---|---|---|
| H1 | IT culture has a positive relationship with student's intentions of e-learning use. | Yes |
| H2 | Social influence will positively influence students' intentions towards e-learning use. | Yes |
| H3 | Performance expectancy will positively influence students' intentions towards e-learning use. | Yes |
| H4 | Effort expectancy will positively influence students' e-learning intentions | No |
| H5 | Facilitating conditions will positively influence students' intentions of e-learning use. | Yes |
| H6 | Intentions towards e-learning use leads actual e-learning use. | Yes |

*Table 3. Constructs and Measurements*

| IT Culture | | |
|---|---|---|
| How frequently do you perform each of the following activities either on mobile phone, tablet, or laptop? | | |
| | Search the Internet for information | |
| | Search the Internet for videos | |
| | Send, receive and read e-mails | |
| | I enjoy using e-mail. | |
| | Check your personal e-mail | |
| | Check your work or school e-mail | |
| | Send or receive files via e-mail | |
| | Download media files from other people on a computer | |
| | Watch video clips on a computer | |
| | Share your own media files on a computer | |
| **Social Influence** | | |
| **Item** | **Measurements** | **Loadings** |
| SI1 | People who influence my behavior think that I should use e-learning technologies | 0.806 |
| SI2 | People who are important to me think that I should use e-learning technologies | 0.896 |
| SI3 | University teachers are supportive of the use of e-learning technologies | 0.572 |
| **Performance Expectancy** | | |
| **Item** | **Measurements** | **Loadings** |
| Perf1 | e-learning Technologies are useful in education in general | 0.552 |
| Perf2 | e-learning technologies enable students to accomplish tasks more quickly | 0.850 |
| Perf3 | e-learning technologies would improve students' performance | 0.841 |
| Perf4 | e-learning technologies would increase students' productivity | 0.827 |
| **Effort Expectancy** | | |
| **Item** | **Measurements** | **Loadings** |
| EE1 | e-learning technologies are easy to use | 0.924 |
| EE2 | Finding or using features in e-learning technologies is easy | 0.799 |
| EE3 | Learning to operate e-learning technologies is easy | 0.859 |
| **Facilitating Conditions** | | |
| **Item** | **Measurements** | **Loadings** |
| FC1 | In general, my University campus has support for e-learning | 0.900 |
| FC2 | In general, the country in which my university campus is located has support (infra-structure, policies etc.) for e-learning. | 0.881 |
| FC3 | I have the resources necessary to use e-Learning. | 0.767 |
| **Use Intentions** | | |
| **Item** | **Measurements** | **Loadings** |
| UI1 | Using e-Learning technologies is a good idea | 0.777 |
| UI2 | I would like to use e-Learning technologies | 0.751 |
| UI3 | I believe that working with e-Learning technologies would be fun | 0.871 |
| **Actual Use** | | |
| **Item** | **Measurements** | **Loadings** |
| AU1 | I intend to use e-Learning technologies in the next semester | 0.495 |
| AU2 | I predict I will use e-Learning technologies in my courses in the next semester | 0.378 |
| AU3 | I have a plan to use e-Learning technologies in the near future | 0.586 |