Review of Factors that Influence Students' Intention to Use E-learning Systems

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Abstract
It is widely acknowledged that technology has continued to influence universities across the globe to adopt and use different forms of electronic learning systems for interaction and knowledge sharing among lecturers and students. Thus, this study reviewed relevant literature on the factors that influence students' intention to use e-learning systems in universities. The review revealed that perceived usefulness, perceived ease of use, information quality, service quality, system quality, and hedonic motivation were identified as the factors that frequently influence students' intention to use the e-learning system. Therefore, this study proposes a conceptual framework on factors that influence e-learning systems among students in Nigeria. The study also identified the bottlenecks that challenge most Nigerian Universities in fully adopting and using e-learning systems. Bandwidth for internet connectivity, computer system availability, electricity challenges, technical expertise, technophobia, and inadequate telecommunication infrastructure pose a great challenge to the utilization of the e-learning system in Nigerian universities. Never-the-less, the combination of popular and novice models could overcome the challenges.

Keywords: Computer-based test, E-learning, Intention to use

Introduction

The proliferation of internet technology and the usage of computer systems and other electronic devices has led to the widespread adoption of e-platforms across the globe. E-commerce, e-business, e-banking, e-finance, e-portfolio, e-training, e-teaching, and e-learning studies have become the areas of discussion in academia and industries. Given the recent technological advancement, the conventional traditional approach of learning is gradually transforming into a modern method in which the role of technology is quite significant. Learning through the usage of the electronic medium is gradually becoming indispensable worldwide (Amin, Akter, & Azhar, 2016). Academic institutions have continued to invest heavily in information systems to derive benefits in areas such as knowledge generation, increasing access to education, cost minimisation, improving self-efficacy, learners' flexibility and interactivity (Sinclair, Kable, Levett-Jones, & Booth, 2016).

Therefore, technological innovation in recent years has been the prime driver of educational transformation as it continues to play a major role in knowledge dissemination. Stakeholders such as students, academic staff and technical staff widely use web-based applications for knowledge generation and sharing (Alsabawy, Cater-Steel, & Soar, 2016). Similarly, e-learning has also created new ways of learning by enabling instructors to deliver learning instructions via other mediums such as audio, video, animations, images and text, as well as providing online learning spaces and timely feedback methods which is accessible to students irrespective of geographical location (Abdullah & Ward, 2016).

The world has become a global village as each part of the world is connected. The adoption of e-learning technologies is spreading far into developing and third world countries (El-Masri & Tarhini, 2017). The 2016 Ambient Insights report highlights the astonishing increase in demand for e-learning systems in several regions of the world (Ambient Insight, 2016). In a study conducted by Docebo (2014), revealed that Africa would witness a 15.2% annual growth rate of e-learning adoption between 2012 and 2016, while that of Asia will be slightly higher at 17.3% annual growth rate. In Nigeria, the application of e-learning is still seen as an emerging concept in higher education as most institutions of learning are not fully utilizing the technology. Given the foregoing, this study is aimed at identifying the

factors that influence students' intention to use e-learning technologies.

Literature Review
E-learning

Clark and Mayer (2011) broadly define e-learning as any educational media that is delivered in an electronic form. Terms such as computer-assisted learning, online learning, web-based learning, and e-learning are often used, but all reflect information delivery via an electronic device for educational purposes. The computer-based test is largely considered as an e-learning technology component used in assessing students. Many studies were carried out to identify the factors that determine students' intention to use e-learning technologies in various context (Abdullah & Ward, 2016; Chang, Hajiyev, & Su, 2017; El-Masri & Tarhini, 2017; Masa, Tarhini, Mohammed, & Maqableh, 2016; Moghavvemi, Paramanathan, Rahin, & Sharabati, 2017; Mohammadi, 2015; Tarhini, Hone, & Liu, 2013). The following section reviews studies conducted in countries other than Nigeria.

Factors Influencing Students' Intention to Use E-learning

Users' acceptance of a new information system or technology has become a prerequisite for the successful implementation of an information system (Almaiah, Jalil, & Man, 2016). Several studies were conducted by scholars across the globe to understand the perception of e-learning users. Factors such as social, organizational, individual and cultural were identified as major drivers of e-learning intention to use by students and other stakeholders alike. These variables were largely drawn from the well-established information system adoption theories and models.

Almarashdeh, Sahari, Zin, and Alsmadi (2010) assessed the success of learning management systems among distance learning students in Malaysian universities and identified information quality, system quality, service quality, perceived usefulness, and perceived ease of use as factors that influence use intention. The result reveals that all the aforementioned factors have a strong and positive relationship on students' intention to use e-learning except for information quality that has an insignificant relationship. Similarly, Li, Duan, Fu, and Alford (2012) researched on e-learners in rural China and argued that among

the factors that directly influence the intention of users towards using an e-learning system include service and course quality, perceived usefulness, perceived ease of use in and self-efficacy.

Farahat (2012), conducted a study among undergraduate university students in Egypt on the determinants of students' acceptance of online learning and how these determinants can shape students' intention to use online learning. The result shows that perceived ease of use, perceived usefulness, attitude, and social influence have a significant impact on intention to use online learning. Chen and Liu (2013) in their study on the effectiveness of information technology (IT) in reducing the rural-urban knowledge divide in Taiwan found technology policy, information integrity, information accessibility, perceived ease of use, perceived usefulness and system support to have a relationship with intention to use. Tarhini et al. (2013) identified the factors affecting students' acceptance of e-learning in developing countries, by collecting data on 569 undergraduate and postgraduate students in Lebanon, and found that perceived usefulness, perceived ease of use social norms and quality of work-life are significant determinants of students' behavioural intention to use e-learning.

Similarly, Mohammadi (2015) investigated users' perspectives on e-learning using an integrated model of TAM and Delone & McLean IS Success model in an Iranian public university and discovered that service quality, technical system quality, content and information quality as well as perceived usefulness have a relationship with the intention to use e-learning. However, the result also shows that educational quality and perceived ease of use has no relationship with the intention to use. Lo, Ramayah and Mohamad (2015) in a study of an e-learning system among university students in Malaysia confirmed that perceived ease of use and perceived usefulness to have a significant relationship with intention to use e-learning. They also empirically proved that intention to use leads to actual use.

Alsabawy et al. (2016) conducted a study on the determinants of perceived usefulness of the e-learning system in a university in Australia. The study identified IT infrastructure services, system quality and information quality as

determinants of perceived usefulness. The result also indicates that service delivery quality fully mediates the relationship between IT infrastructure services, system quality, information quality, and perceived usefulness. Masa et al. (2016), while modelling factors affecting students' usage behaviour of e-learning systems in Lebanon (Beirut), found that performance expectancy, hedonic motivation, habit, and trust have a significant relationship with the intention to use. Similarly, facilitating conditions and intention to use also has a significant relationship with use. However, effort expectancy and social influence have no significant effect on the students' intention to use. Wang (2016) studied the factors influencing usage of e-learning in Taiwan's public sector and identified performance expectancy, effort expectancy and social influence to have a significant relationship with behavioural intention, while facilitating condition and intention have significant relationship with usage behavior.

Chang, Hajiyev, and Su (2017) applied the recently developed General Extended Technology Acceptance Model (GETAMEL) by Abdullah and Ward (2016) to examine the students' intention to use e-learning among undergraduate and postgraduate students in Azerbaijan. They disclosed that social norms, perceived usefulness and perceived ease of use are predictors of intention to use.

In a comparative study between developing and developed countries, El-Masri and Tarhini (2017) investigated the factors affecting the adoption of e-learning system in Qatar and the United States of America (USA). They carried out an online survey on 833 students from one university each in Qatar and the USA. They discovered that performance expectancy, hedonic motivation, trust, and habit have a significant relationship with behavioural intention to use e-learning. They also showed that effort expectancy and social influence have a significant relationship with intention to use in Qatar even though it is a developing country. However, in the USA, a developed country, no relationship was found. Finally, facilitating conditions was found to have no significant effect on intention in Qatar, but in the USA it has a significant relationship.

Furthermore, Moghavvemi et al. (2017) while assessing students' perceptions towards e-learning via Facebook in University Malaya, found that hedonic motivation, playfulness, performance expectancy and social influence have significant relationships with the intention to use. However, with effort expectancy, the relationship was insignificant. Furthermore, facilitating conditions, habit and intention to use were found to have a significant relationship with system use as its predictors. These studies have revealed the most frequently used variables to assess the factors that determine the students' intention towards the adoption of e-learning across different countries in the world.

Based on the reviewed literature in this study, the result highlighted the variables most frequently used to assess individuals' intention to use e-learning technologies. Perceived usefulness and perceived ease of use from the technology acceptance model (TAM), as well as performance expectancy, effort expectancy, habit, facilitating conditions, hedonic motivation and price from the unified theory of acceptance and use of technology (UTAUT) were also investigated. Therefore, these two models were the most frequently used in the literature to examine the phenomena. However, the technology readiness index (TRI) (Parasuraman, 2000) and the newly developed TRI 2.0 (Parasuraman & Colby, 2015) framework were infrequently used. Therefore, variables from the TRI 2.0 model such as optimism, innovativeness, discomfort, and insecurity can be further investigated empirically as factors influencing the users' intention to use the e-learning technology, especially in the Nigerian context.

Challenges of E-learning System Use among Nigerian Students

Irregular electricity supply is a perennial problem affecting almost every aspect of the Nigerian economy, including education. Without electricity, there is hardly any system that can work as the other alternative sources are very expensive. Electricity problem was believed to be the major setback in terms of Nigeria's technological advancement (Oye, Salleh, & Iahad, 2011). There is a high cost of acquiring and installing hardware and software technologies needed for e-learning, which makes access to internet costly. Bandwidth in some universities is very limited due to the poor condition of existing telecommunication infrastructure. Similarly, technophobia, reluctance to change and the absence of

affordable specialized e-learning centers, coupled with the limited number of technical staff, are among the major issues of concern with regards to e-learning application adoption in Nigeria (Aduke, 2008; Ajadi, Salawu, & Adeoye, 2008; Anene, Imam, & Odumuh, 2014; Omotayo & Tiamiyu, 2017). These, among others, are some of the reasons responsible for the very low adoption of e-learning technologies. Therefore, conducting empirical investigations to identify such influencing factors will be of great importance to scholars and practitioners.

Conclusion

It is in line with these aforementioned issues that this study proposes a conceptual model necessary for the examination of the factors that influence students' intention to use e-learning technologies such as Computer-based Test (CBT) with variables related to the peculiar nature of the Nigerian context. Such factors could include variables from the technology readiness index such as optimism, innovativeness, discomfort, and insecurity. It is expected that such empirical findings will validate some of the underlying assumptions and provide a clear direction on how to fully integrate technology into the teaching and learning process in Nigerian Universities. Considering Nigeria's high population of around 200 million people, such a step would minimise to a very large extent most of the issues affecting the educational system. Also, it is recommended that the survey questionnaire instrument is more appropriate in collecting data from the students on their perception regarding e-learning technologies. Famous models that are used for assessing individual behavioral intentions such as TAM, UTAUT can be combined with the TRI framework in future studies. Variables could be drawn from the models to develop a conceptual framework that will address the underlying issues. Specifically, TRI 2.0 was found to be among the least used framework to empirically investigate the factors that influence users' intention to adopt e-learning technology. Future empirical investigations should provide clarity on the specific variables that influence users' perceptions.

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