



# Assessment of Structural Interrelationships between Technology Readiness, Technology Self-Efficacy, Subjective Norms, Job Relevance and Perceived Ease of use with Perceived Usefulness Towards E-Learning Utilization Among University Lecturers in Northeast Nigeria

**Madu Kabu PhD.**

Department of Technical Education, Ramat Polytechnic Maiduguri, Borno State

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**Abstract:** *The aim of this study is to investigate structural relationships between factors that influence the e-learning utilization with the view to develop a model that will explain and predict utilization of e-learning system based on the interrelationships that exist between, technology readiness, technology self-efficacy, subjective norm, job relevance, perceived ease of use and, perceived usefulness and e-learning use using the extended Technology Acceptance Model (TAM) among university lecturers. The study will be guided by one objective and five hypotheses. This study will employ a correlational study and will be done in the Northeast zone of Nigeria, comprises of six (6) states of Adamawa, Bauchi, Borno, Gombe, Taraba, and Yobe. Six universities: one university from each state of the six states will be selected using stratified random sampling technique. These universities have a population of 733 lecturers in the faculty of education. Using Cochran's formula, a sample of 273 is drawn. The instrument that will be used for data collection will be a structured questionnaire design in line with Likert ranking scale. The instrument will be validated by two experts. A pilot test will be conducted on a sample of 30 lecturers and Cronbach alpha will be used to determine the reliability of the instrument. Data collected will be analyzed using SPSS 22 and AMOS v22 to predict structural equation modeling.*

**Keywords:** *Education; lecturers, Information Communication Technology; Students*

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## Introduction

The 21st century is considered as the information age, such that e-learning have advanced dramatically in every nation of the world. The e-learning utilizes the power of the web, interface are designed for distant learning student's, by provision of modules from teachers/lecturers of universities. These modules are made available on web portals to be accessed by registered students (Arkorful & Abaidoo, 2015). As opposed to conventional norm where the lecturers meet students' simultaneously at the same place and time, in online learning, lecturers and students are isolated by location and time (Moore & Kearsley, 1996). The lecturers are not the sole authority of the essential materials that are in use on e-learning systems. The learners are also facilitators in the learning process (Bahhouth *et al.*, 2011). Due to the present and anticipated development opportunities being anticipated from internet technologies, many universities now

rely on e-learning systems to provide instructions to students via respective institution's web portals (Revythi & Tselios 2019). Teaching online is a new system for many traditional university lecturers (Hawkins *et al.*, 2012) and though, not all people have adopted this advancement in learning, Lamentably, some academic management still have a low acceptance pace of e-learning systems, which at some point turns into an obstruction to the use of the e-learning systems. (Allen & Seaman, 2013).

At the point when lecturers have inspirational frames of mind towards innovation, they are increasingly disposed to acknowledge and gain proficiency with the abilities expected to utilize the innovation, however when lecturers have negative demeanors toward innovation, they are less disposed to acknowledge and get familiar with the aptitudes needed to be utilized for innovation (Valencia-Arias *et. al.*, 2019). In order to meet the fast-growing change in the world we live today, there is a need to adopt fast method of learning in order to catch up with the present challenges of the day. This solution is what e-learning offers the world today (Nebeolisa 2014).

The achievement of e-learning appropriation in educational establishments relies upon a few variables; Al-Adwan, and Smedley, (2012) for instance, the accessibility of innovation, how teachers are bolstered in utilization and the combination of innovation inside the student learning knowledge. Lamentably, the integration of the e-learning style is faced with a few difficulties as integrating changes in the attitudinal desires and acceptance enhancements through advancement of high-tech aptitudes of staff which made it difficult for many countries, people, organizations especially in Nigeria to make use of it to solve their educational needs (Kpolovie & Awusaku, 2016).

This study focused mainly on conditions that motivate electronic learning utilization in Nigeria. The main purpose is to make a discovery on the circumstances that impact e-learning utilization among Nigerian university lecturers. In this study, the external factors, otherwise called independent variables, include Technology Readiness, Subjective Norms, and Technology self-efficiency, Job Relevance, Perceived Enjoyment and Facilitating Conditions while the eternal factor, generally called dependent variable, is the e-learning utilization.

This study is quite crucial now, especially because Nigeria as a country still being bedeviled by e-learning utilization crisis in its educational sector (Kpolovie & Awusaku, 2016; and Osuafor *et. al* 2015). However, when a new technology finds its way into education, lecturers have no option but to be faced with the challenges of how to integrate it with their past educational experiences (Niederhauser & Lindstrom, 2018; and Teo, *et. al.*, 2018). Based on the model to be used in this study, predictors for the variables of lecturers' e-learning utilization will be explored by investigating the relationship linking the factors and how they influence the utilization of e-learning systems in educational contexts.

### **Statement of the Problem**

The call for the utilization of new technology for classroom activities to adapt changing ideas about knowledge and learning is on the increase. According to literature this call has mounted pressure on tertiary institutions to focus more on the teaching skills of 21st century (Belland,

2015). For new ICT system (such as e-learning) to be embraced and executed adequately, a strong comprehension of user utility must be addressed in light of the fact that a lecturer's goal and attitude toward the agenda assumes a significant role in the use of the framework.

Today universities are investing huge budget on these learning technologies to close the gap the raising challenges of information technology and e-learning utilization in supporting teaching and learning process (Islam, 2013). Still, the educational process depends on lecturers to accept or reject using the new technology (Koh & Chai, 2014). Nevertheless, empirical evidence indicated that most lecturers in higher education are being reluctant to embrace ideas of different forms of online teaching (Bacow et al., 2012; and Hawkins et al., 2012). In the 21st century, students are not dormant collectors of instructions and information. They are proactive supporters of the learning procedure that is coordinated and assessed by virtual teacher. Several studies have featured the upsides of an e-learning form over a conventional domain; be that as it may, several lecturers have indirect responses to the utilization of an e-learning condition (Hawkins et al., 2012). E-learning is a novel methodology in tertiary virtual universities and with an expansion of educational institutions utilizing the web for training, lecturers use of innovations are impacted by an assortment of factors (Teo, 2010). Those factors are the focus of this study. Several studies have been conducted since 2000 on the acceptance and utilization of technology (Al-alak & Almnawas, 2011; Behera, 2012; Chen & Tseng, 2012). However, a dearth of empirical studies exists that evaluate the factors that impede or encourage utilization of e-learning among university lecturers in e-learning environments (Barbour, McLaren, & Lin, 2012). Davis et. al., (1989) deposited that TAM is a powerful, concise data structure hypothesis that is applied to describe and predict how users come to utilize and positively acknowledge innovation (Venkatesh & Morris, 2000). Excluding e-learning acceptance and utilization, TAM has been used repeatedly, and validated in several experimental studies, in a variety of fields, to evaluate the selection, utilization, and acceptance of information correspondence and innovation in educational instruction (Cheng, 2012; Chen and Tseng, 2012; Masrom, 2007).

Considering the hypothesis of the research, TAM clarifies university lecturers on e-learning utilization by proposing a reasonable structure which will analyze the impacts of external factor on system utilization (Hong, et. al., 2001). This study applied extended TAM to assess how the predictor variables (i.e., Technology Readiness, Subjective Norms, and Technology Self-efficacy, Job Relevance, perceived ease of use, and perceived usefulness) predict the criterion variable (e-learning utilization).

## **Literature Review**

### **E-learning**

E-learning is the teaching method that uses internet-mediated technologies electronically to improve the delivery of teaching materials, communication, and collaboration between learners and lecturers in a virtual environment (Ibrahim, Leng, Yusoff, Samy, Masrom, & Rizman, 2017; Poonam, 2016), as the unique strategy of learning that combines technologies and specially designed learning materials. E-learning as an innovative approach to delivering formal or informal learning materials, electronically-mediated, well-designed, learner-centred and interactive learning environment to anyone, anytime and anyplace by utilizing the internet and digital

technologies (Nwokike, 2010). In this study, e-learning refers to a method of applying internet-mediated technologies to deliver learning materials to the learners in the learning environment (anytime and anyplace). In general, e-learning is referred to the teaching and learning method that needs internet-mediated technologies access which lecturers utilize to interaction and for knowledge sharing with students.

### **Technology Readiness (TR)**

According to Parasuraman (2000), technology readiness is a factor that correlate to innovation in widespread phenomenon which contended that behavior differs among people to people, culture to culture and consequently their thoughts about several aspect of innovation varies. Similarly, Parasuraman posits that TR has a comparative power of each peculiarity shows a person's fought rightness to innovation, though TR does not reflect a set of convictions about innovation however a pointer of an individual's skill in utilizing it. Parasuraman and Colby (2015) investigated technology readiness index using 36 items to determine people's intention to accept and use cutting-edge innovation. The result findings indicate that TRI has a straight influence on perceived usefulness, perceived ease of use and behavioral intention to use a new system.

### **Technology self-efficacy (TSE)**

Technology self-efficacy (TSE) is regarded as the extent to which people have confidence in their effort to achieve some task/job using the technology-related tools (Nicholas-Omoregbe *et. al.*, 2017; Compeau and Higgins, 1991; Venkatesh and Bala, 2008; Holden and Rada, 2011; Celik and yesilyurt, 2013; Lee and Lee, 2014). It also refers to "individual's judgments of their capabilities or skills to put in order to accomplish a goal (Kim, *et. al.*, 2013). Technology self-efficacy is the notion with the ability to execute a specific behavior and it is a crucial concept in SCT (Holden & Rada, 2011). Technology self-efficacy has to do with personal decision in their abilities to apply technology in extraordinary conditions (Comer, 2018). Any person with a vulnerable experience of innovation effectiveness can be irritated greater easily via hindrance to their performance and will reciprocate through reducing their thoughts of their ability utilizing a laptop or information. In e-learning to know the setting, human beings' high volume teaching effectiveness perceive they're able to execute exceptionally while utilizing online-learning to know frameworks. They may be even more equipped to strive e-learning model and to continue making feel of how they function. Apparently, people with low technology self-efficacy might be upset in any respect of effort and be effortless through hard deterrents and will probably give up trying e-learning device use.

### **Subjective Norms (SN)**

Subjective norm refers to the feelings of a person altered by individuals that are of high esteem to him/her. Such persons can be influenced by their ways of live and believe. This scenario determines the behaviors towards acceptance to execute particular conduct (Compeau and Higgins, 1991; Davis, 1989; Venkatesh and Bala, 2008). subjective norm is the apparent pressures on individual to do certain social behaviour and their drive to follow these pressures (Fishbein & Ajzen, 1975). According to Venkatesh & Bala, (2008) subjective norm means the level to which the person social behaviour is influenced by others (for example, peers, parents, and students) to

use a particular technology. Consequently, it has been recommended for investigating social condition influence of a person's behaviour in the subsequent modifications of TAM. As an individual's colleagues believed a scheme to be helpful, that person tends to share the same vision (Venkatesh & Davis, 2000). Within the transformed TAM, by Venkatesh and Davis (2000), subjective norm was found in TRA, TAM2, TPB and C-TAM-TPB, to be external factors, which may have an effect on PU and BI. Studies on TAM 2 validation have tested that subjective norm significantly affected BI in a system use scenario (Venkatesh & Davis, 2000). Three constructs from the aforementioned models capture the concept of effort subjective norm: perceived usefulness, attitudes and behavioral intention (TAM/TAM 2, 3) Venkatesh & Davis, 2000; Venkatesh & Bala, 2008).

### **Job Relevance (JR)**

Job relevance is the way a person accepts the independent system applicable to his/her activity ((Nicholas-Omoregbe *et. al.*, 2017; Venkatesh and Davis, 2000). Job relevance refers to as the degree to which a persons' activity utilizes innovation and the degree to which the innovation is relevant and significant to be applicable to the activity accomplished his/her job (Kim, 2008). In this study, JR is used as the degree to which a university lecturer' hope e-learning is relevant to his/her activity in the classroom teaching.

Extant literature indicates that instructors discern of the pertinence of e-learning to their teaching jobs is potentially important in determining how they accept and use such e-learning. Egbri (2012) has observed that the use e-learning for instructing and training in tertiary institutions is vital for the impartation and acquisition of technology for both the lecturers and the students. Job relevance can be described as the volume to a personal trust that the target system is applicable to his or her job, (Venkatesh and Davis, 2000). In their attempt of developing and testing a theoretical extension of the TAM (Venkatesh and Davis, 2000) found the existence of an interactive effect, between job relevance and perceived usefulness.

### **Perceived Ease of Use (PEU)**

Perceived ease of use is referred to a situation to which a person thinks and hopes that by utilizing the framework they will become free from further rigorous effort set to achieve. PEU have also been described as how much computer system is used to perform a job without effort and its degree of being stress-free (Ibrahim *et. al.*, 2017; Teo, 2011b).

Perceived ease of use is a core concept of TAM and a person makes use of it to observe the system belief. This belief facilitates the user to perceive the system as clean and free from strain and use of power involved (Davis, 1989). In testing the modified fashions of TAM, it indicates that the findings of the learning that most consequences of the research showed that the two robust ideals mediate the impact of the external changes on system utilization (Davis, 1989; Venkatesh and Bala, 2008). For example, this belief indicates how a whole lot of the system enables the users to enhance their jobs or their research. The outcomes of just about all studies in the area of TAM have proven that perceived ease of use has a robust impact on system use (Davis, 1989; Abas *et al.*, 2004; Venkatesh and Bala, 2008; Venkatesh and Davis, 2000).

### **Perceived Usefulness (PU)**

Perceived usefulness is described as a personal trust that utilizing innovation would improve activity performance and that it is useful to one's job (Ibrahim *et. al.*, 2017; Davis, 1989) It can equally be referred to as a prospective user emotional likelihood that utilizing a particular specific framework will build up his or her activity implementation (Teo, 2011b). In this study, it is referred to how much lecturers are convinced that utilizing e-learning system will make their teaching work more useful and to what level will it build teaching activities in the classroom.

Perceived usefulness is one of the critical ethics of TAM and it is believed to be a middle construct to be used for the unique situation in research (Davis, 1989). In line with Davis *et al.* (1989), perceived usefulness is regarded as the volume to which a man trusts that utilizing a specific technology will upgrade the duty implementation. Based on this view, therefore, academics lecturers are in likelihood going to make use of or not to utilize the usual to the degree that they trust it will improve their work ordinary with admire to the system utilization. This examines the system use and how it is useful for the user to enhance and improve his/her job or studies. In testing the modified models of TAM, it was revealed that the findings established that about all outcomes of the education revealed that the perceived usefulness is a strong confidence that mediates the impact of the external changes on system utilization (Davis, 1989; Venkatesh and Bala, 2008). The result of testing TAM2 by Venkatesh and Davis (2000) revealed that perceived usefulness had a powerful influence on behavioral intention. Abdullah, Ward, and Ahmed (2016) conducted research on investing influence of variables. It was found that both perceived ease of use and perceived usefulness predict behavioral intention to use a system.

### **E-learning Utilization (ELU)**

The TAM extended ultimately theories that behavioral intention and facilitating conditions predict use behavior. Consequently, this is by all accounts of the least researched and consequently least comprehended development in users' acceptance models. Legris *et al.* (2001) basic survey of TAM found just eleven (11) out of twenty-two (22) that thinks about where user's behavior was estimated. Most study measure use through self-revealing, while just one (1) study estimated use by a programmed estimating instrument, for example, in Venkatesh *et al.* (2003) study, where framework logs were utilized to consequently quantify use. Taiwo and Downe's (2013) meta-examination of certain study affirms that the relationship between Behavioral Intention and Use Behavior (BI-UB) were just revealed from thirteen studies.

### **Methodology**

This study aimed to investigate structural relationships between factors that influence the e-learning utilization with the view to explain the interrelationships that exist between, technology readiness, technology self-efficacy, job relevance, subjective norm, and perceived ease of use with perceived usefulness and e-learning utilization. The study formulates five hypotheses. This study adopted a correlation research design.

The area of the study is North eastern region states of Nigeria. These states are; Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe states. This region is located between longitude 110731N and latitude 100141E of the Greenwich Meridian and lies within the. North eastern region of



Nigeria. Nigeria's total land area is 103,639sq/km<sup>2</sup>. (World Atlas Map). The study was carried out in 4 technical colleges in the northeastern region of Nigeria.

The population of the study consist of all lecturers in the Faculty of Education in 13 Universities in the North-eastern Geo-Political Zone. However, six universities: one university from each state of the six states is selected using stratified random sampling technique. The universities that are randomly selected are: Modibbo Adama University of Technology Yola, Adamawa State; Abubakar Tafawa Balewa University Bauchi, Bauchi State; University of Maiduguri, Borno State Gombe State University Tudun- Wada, Gombe State; Taraba State University Jalingo, Taraba State; and Yobe State University Damaturu Yobe State. These universities have a population of 733 lecturers in the faculty of education. Using Cochran's formula, a sample of 273 is drawn.

Six (6) research assistants were used in investigating structural relationships between factors that influence e-learning utilization with the view to explain the interrelationships that exist between, technology readiness, technology self-efficacy, job relevance, subjective norm, and perceived ease of use with perceived usefulness and e-learning utilization.

The instrument used for data gathering was a questionnaire with 14 open and close-ended questions in part A. While, Part B collection of data for measuring the model constructs with 6 constructs, (TR, TSE, JR, SN, PEU and PU) designed in a 5-point Likert-scale of Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2. Strongly Disagree = 1. The instrument was validated by two experts. Also, the instrument will be pilot-tested in two universities that will be randomly selected. The reliability correlation coefficient between the paired scores was determined using Pearson Product Moment Correlation Coefficient using SPSS version 22. The Structural Equation Modeling (SEM) approach was adopted for data analysis.

## **Results and Discussion**

The study aimed to understand the structural interrelationships between technology readiness, technology self-efficacy, subjective norms, job relevance, and perceived ease of use with perceived usefulness towards e-learning utilization among university lecturers in Northeast Nigeria. The findings suggest that university lecturers in the region are generally inclined towards adopting and utilizing e-learning systems for classroom instruction.

The results indicated a high level of technology readiness among the lecturers, with a mean score of 3.71 (SD=1.07), implying that they perceive technology as available and accessible for classroom use. This readiness is a positive sign for the integration of e-learning into academic activities, emphasizing the importance of technological infrastructure in facilitating e-learning adoption.

Additionally, technology self-efficacy among the lecturers was found to be strong, with a mean score of 3.62 (SD=1.02). This suggests that lecturers feel confident in their ability to understand and apply e-learning technologies in classroom teaching, regardless of the complexity of the technology. Such self-efficacy is crucial for the effective utilization of e-learning resources, as it empowers lecturers to overcome challenges and innovate in their teaching methods.

Furthermore, subjective norms (SN) played a significant role in influencing lecturers' decisions to use e-learning, with a mean score of 3.58 (SD=0.91). This implies that peer influence and social approval significantly impact the lecturers' willingness to adopt e-learning technologies. The positive regard for colleagues who have embraced e-learning indicates the potential for peer-led initiatives to promote e-learning adoption across the university.

## **Conclusion**

In conclusion, the study's findings suggest a favourable environment for e-learning adoption among university lecturers in Northeast Nigeria. The combination of high technology readiness, strong self-efficacy, and positive subjective norms indicates a promising landscape for the successful integration of e-learning into the academic curriculum. Moreover, the perceived ease of use, job relevance, and perceived usefulness of e-learning further reinforce its potential as a valuable tool for enhancing teaching and learning experiences in the region.

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