Assessment of Lecturers' Acceptance and Adoption of M-Learning Technology for Instructional Delivery in Tertiary Institutions in Kogi State, Nigeria

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Abstract
This study assessed lecturers' acceptance and adoption of M-learning technology for instructional delivery in tertiary institution in Kogi State. The study was guided by six research questions and four of them were hypothesized. The study adopted a descriptive research of the cross sectional survey type. The population of the study consisted of lecturers in tertiary institutions in Kogi State. Purposive sampling technique was used to select one university, one polytechnic and one college of education that was used for the study. The sample size of the respondent was 333 lecturers. A researcher's designed questionnaire titled LAAMTID was used as the instrument for data collection and the study instrument was validated by experts. Mean, t-test and ANOVA were used to analyze the data. The analysis was done using SPSS. The findings indicated that lecturers' in tertiary institutions in Kogi State accept M-learning technology. That gender was not a moderating factor in lecturers' acceptance of M-learning technology in instructional delivery in tertiary institutions in Kogi State. Also, that gender was a moderating factor in lecturers' adoption of M-learning technology in instructional delivery in tertiary institutions in Kogi State. That area of specialization is not a moderating factor in the acceptance of M-learning technology among lecturers' in tertiary institutions in Kogi State. Based on these findings, it was recommended that lecturers 'should be motivated and encouraged to incorporate the adoption of M-learning technology for instructional delivery in tertiary institutions by organizing of workshop through agencies such as TETFUND. Gender should be considered in the adoption of M-learning technology, authorities of tertiary institutions should adopt strategies that are gender sensitive while planning to integrate M-learning technology. Also, lecturers irrespective of their area of specialization should be given equal opportunity to integrate and utilize M-Learning technology.

Keywords*: Assessment, Adoption, Acceptance, M-Learning Technology, Instructional Delivery, Lecturers and Tertiary Institutions.*

INTRODUCTION

Looking around us, we will observe that almost everybody has a smart phone; this is because mobile technology is the current trend, as it can be applied in all aspect of human endeavor. For example, looking at the banking sector where business transaction can be done in the comfort of our homes with the use of mobile phones, we can transfer and receive money from any part of the world. Same with shopping which can also be done from our homes and offices .Example is our Nigeria popular Jumia online store where you can shop online make payment on line and the goods are delivered to your door steps.

Another popular application of mobile device is the social media that almost everyone is involved in and which allows one to advertise his or her business, make voice and video calls, keep yourself abreast the of current news, undergo online training, search for old friends/meet new people, get heath advice from social site like Ask the Doctor and many more. Coming down to education, mobile devices can also be applied like going online to source for educational materials, download and upload materials, access information and many more.

All these are made possible through the birth of ICT which has played a critical role in human endeavors. ICT is being used globally, and it has been used to improve the quality of teaching and learning. ICT is referred to as an effective media for communication that the teachers use for instruction purpose, including the use of electronic gadgets as overall methodology (Ogunwale and Ojo 2007; Omiola, 2011; Olanrewaju, Adeshina & Kareem, 2016) Learning in institutions has been shaped as well as influenced by the various types of technology that has been witnessed in the past and present. The traditional methods for instruction were characterized by the use of textbooks during the paper based dispensation. Now in the technology era; the acquisition of knowledge is depicted as a process that is mediated by the device. These emerging technologies pave way for the progress of numerous prospects that enhance the learning process in such a manner that was not possible before now.

With the advances in mobile technology, it is already possible to support learners and teachers on the move, through what we call mobile learning. Mobile learning is the provision of education and training on Palmtops, handhelds, smart phones and mobile phones. Mobile learning through the use of wireless technology allows anyone to access information and learning materials from anywhere and at any time. Shuler (2003) explained mobile learning as learning by means of mobile technologies such as mobile phones, smart phones, e-readers and tablets; and argues that these devices offer ' unparalleled access to communication and information'.

There is an increase in the use of mobile devices in different areas of society to meet the needs of individuals on the move. Interest in mobile learning is growing in tertiary education as lecturers and students possess mobile devices. Mobile learning is considered a new and more flexible educational strategy where students have opportunities to review course content or communicate with their peers and lecturers "anywhere," "anytime" without the restrictions of fixed-location computer technology and lectures halls. An enhanced potential of e-learning is now being realized with the advent of mobile learning tools.

Mobile learning can make a positive contribution toward teaching and learning. Learning is predicted to move more and more outside of the online or traditional classroom contexts thus becoming more situated, personal, collaborative and lifelong. From observation, the new generation of students considers technology to be part of their lives and a steadily increasing number of today's students use their own personal mobile technologies. If lecturers intend to situate learning within the students' world, then ignoring the opportunities for mobile

learning would run counter to the declared contemporary missions and practices of some universities.

Although it offers unique opportunities for lecturers and students, mobile learning demands new educational approaches of delivery and facilitation (Corbeil and Corbeil, 2007), just as with earlier generations of e-learning transformation. Adherence to pedagogical "best practice" must be central to any mobile learning project adoption. However, the pedagogical purposes for using mobile technologies have not been widely discussed in tertiary education. Compared to Internet-connected computers, the popular distribution of mobile devices is already familiar, easy-to-use and widespread among learners. Lecturers need to adopt mobile 21st-century tools for 21st-century learners. As matters now stand, education tends not to expose students to these tools, thus widening the technology gap between institutions and the learners they serve.

Mobile learning is the use of portable wireless devices for learning. While a mobile phone which possesses several capabilities and functionalities is basically for communicating, mobile learning (M-Learning) aims at optimizing these properties in a learning environment. In M-learning, the mobile device is the tool which acts as the focal point that reconciles all forms of learning activities, experiences and explorations. The implementation of m-learning suggests that the attitude towards learning tasks, interaction and communication can be improved and therefore it increases the ability to learn. Hence in this study, m-learning is depicted as a situation in which the mobile device acts as a facilitator in the learning process.

Gender and area of specialization are among the factors that the researcher considered being important as are been tested in researches. Even taking into account that both factors are significant; there is still no clear understanding of how and why these factors may affect lecturers' acceptance and adoption of mobile technology for instructional delivery. Also, literature associate acceptance and adoption to personal characteristics (mediated factors) such as gender, and area of specialization.

Assessing lecturers 'acceptance and adoption of mobile learning technology for instruction is yet another area in which gender may manifest itself. However, it is generally often neglected in technology utilization for instruction studies (Gefen and Straub, 1997). Having that, this study further understands the moderating effect of gender on the relationship between the acceptance and adoption.

Area of specialization is the discipline individual lecturers in the tertiary institutions specialised on (Daramola, 2011). In the tertiary institution, area of specialization can be grouped into sciences, vocation and humanity. Regardless of the lecturers' area of specialization, the use of mobile technology for effective teaching cannot be over-emphasized.

Statement of the Problem

Teaching and learning has shifted from the teachers' point of view to student centered and there is a move from the traditional classroom environment to a virtual classroom environment. Technology has been changing many aspect of higher education, including the way of teaching and learning. The adoption of technology at post-secondary institution has therefore become an important research topic.

Mobile technologies have spread among large numbers of people, Tertiary institutions adopt e-learning and communication media in education since the traditional learning no longer meets the needs of the contemporary society. Tertiary institutions have to take advantage of the potential applications of the mobile technologies in instruction. Thus, they have to provide special environment to make use of the mobile technologies in developing the lecturers'

capabilities in instruction and giving them the opportunity and access to the new innovations to reach a high level of excellence and creativity.

It is also important to ascertain lecturers' acceptance and adoption of mobile technology for instruction before the utilization of mobile learning because lecturers are central in the dissemination of the curriculum at the tertiary level of education. There were more research work on adoption and perception of computer for instructional delivery but a few on mobile learning. Few empirical works have been done on Awareness and Attitude of lecturers towards the use of M-learning for instructional delivery. But not much has been done on lecturers Acceptance and Adoption of mobile learning.

With the coming of the use of mobile learning, will lecturers accept the use of M-learning in instructional delivery? Even if it is accepted, will they adopt the technology? And when the technology is adopted, will they use it? Hence, there is the need to assess acceptance and adoption of M-learning technology for instructional delivery in tertiary institution in Kogi state, Nigeria.

Research Questions

This research was guided by the following research questions:

1. Do Lecturers accept M-learning technology for instructional delivery in tertiary institutions?
2. Do Lecturers adopt M-learning technology for instructional delivery in tertiary institutions?
3. Will Gender influence Lecturers' acceptance of M-Learning technology for instructional delivery in tertiary institutions?
4. Will Gender influence Lecturers' adoption of M-learning technology for instructional delivery in tertiary institutions?
5. Will Lecturers' area of specialisation influence acceptance of M-learning technology for instructional delivery in tertiary institutions?
6. Will Lecturers' area of specialisation influence adoption of M-learning technology for instructional delivery in tertiary institutions?

Statement of Hypotheses

The following hypotheses were generated to answer research questions 3-6 and tested at 0.05 level of significance:

Ho_1: There is no significant difference between male and female Lecturers acceptance of M-Learning technology for instructional delivery in tertiary institution.

Ho_2: There is no significant difference between male and female Lecturers adoption of M-Learning technology for instructional delivery in tertiary institution.

Ho_3: There is no significant difference in the Area of Specialisation of lecturers' acceptance of M- Learning technology for instructional delivery in tertiary institution.

Ho_4: There is no significant difference in the Area of Specialisation of Lecturers' adoption of M-learning technology for instructional delivery in tertiary institution.

Objectives of the Study

The main purpose of this study is to assess the acceptance and adoption of M-learning technology for instructional delivery in tertiary institutions in Kogi state, Nigeria. Specifically, the study will assess:

1. Lecturers' acceptance of M-learning technology for instructional delivery in tertiary institutions.
2. Lecturers'adoption of M-learning technology for instructional delivery in tertiary institutions.
3. Influence of gender on lecturers acceptance of M-learning technology for instructional delivery in tertiary institutions.

4. Influence of gender on lecturers adoption of M-learning technology for instructional delivery in tertiary institutions.
5. Influence of lecturers' area of specialization on acceptance of M-learning technology for instructional delivery in tertiary institutions.
6. Influence of lecturers' area of specialization on adoption of M-learning technology for instructional delivery in tertiary institutions.

Study Area

This research was limited to only lecturers in tertiary institutions in Kogi State, Nigeria. The state has three (3) senatorial districts with two (2) universities, two (2) polytechnics and three (3) colleges of education. This study assessed the acceptance and adoption of M-learning technology for instructional delivery in tertiary institution in Kogi state, Nigeria.

Literature Review

The technology acceptance model has been a theory that is most widely used to explain an individual's acceptance of an information system. This study is based on the TAM theory that is proposed by Davis (1989) to analyze and identify the determinants, which make Lecturers to accept m-learning. The research model illustrates the categories, organization and potential flow of the seven latent constructs (i.e., Perceived Usefulness, Perceived Ease of Use, Network Accessibility, Quality of Content, Student Readiness, Social Influence, and Intention to Use). Researchers have used different models to explain the acceptance and the intension to use computer assessment system (Teo, 2009). Perceived Usefulness and Perceived Ease of Use from TAM has been used in many studies regarding technology. (Yi & Hwang, 2003). The conceptual framework for this study was adapted from Technology Acceptance Model (TAM) proposed by Davis, Baggozi and Warshaw (1989). TAM is one of the most important models for understanding adoption of information technology in education.

Mobile Technologies and their uses in Education

Mobile technology consists of mobile IT devices and variety of communication technologies Lam, Yau and Cheung (2010). There is variety of different mobile IT devices. Also the applications of mobile learning can vary greatly according to the needs of the learners' or organizations'. One of the biggest challenges is the rapid development of technologies. The development of the m-learning clearly is balancing between student and organizational needs and the rapid technological changes (Lam, Yau and Cheung, 2010). Also Sharples (2000) represented core characteristics for mobile technologies to support contextual life-long learning. According to Sharples (2000) technologies should be: highly portable, so that they can be available wherever the user need to learn; individual, adapting to the learner's abilities, knowledge and learning styles and designed to support personal learning; unobtrusive, so that the learner can capture situations and retrieve knowledge without the technology obtruding on the situation; available anywhere, to enable communication with teachers, experts and peers; adaptable to the learner's evolving skills and knowledge; persistent, to manage learning throughout a lifetime, so that the learner's personal accumulation of resources and knowledge will be immediately accessible despite changes in technology; useful, suited to everyday needs for communication, reference, work and learning; and intuitive to use by people with no previous experience of the technology.

Some of these requirements can of course be satisfied by traditional tools and methods but new technologies can supplement traditional tools and methods by offering learners the opportunity to manage their learning over long periods of time, to engage in worldwide collaboration, and to relate near-unlimited information to situated problems.

A device that truly supports mobile learning has to be 'hand-held' and also 'hand-operated'. Devices that need to be carried (e.g., netbooks) or require preparation (e.g., cameras) break the concept of learning as a spontaneous everyday activity. DeGani (2010) reminded that two points are important to note. The first relates to the rigidity of the definition of mobile learning devices. Some devices might be closer to the pure definition than others. The second point has to do with the ways in which the devices are used in. Some tasks with particular device engage students more in mobile learning than others.

Mobile learning system in Nigeria

There are numerous (106) federal, state and privately own universities in Nigeria (Ahmad, Chinada, Gambaki, Ibrahim and Ala, 2012), but few employ learning management systems or implement a viable e-learning system. They therefore advocate the adoption of Moodle by Nigerian Higher Education Institutions (HEIs), specifying that Moodle has the appropriate tools to manage and promote learning in addition to its scalability, support for blended learning, and the fact that it can be customized to suit the users.

In another but related study, Liverpool, Marut, Ndam and Oti (2010) proposed a model for the integration of e-learning in Higher Education Institutions based on the experiences of the ICT-Math's initiative in the University of Jos. The proposed model which used Moodle as the LMS consisted of two phases: one for the pre-project activities and the second for the implementation processes. Similarly, Ayanda, (2011) developed an e-learning model using an evolutionary software approach. Due to the high cost of computers and internet bandwidth, these two models had a small impact on learning itself (Madu and Pam, 2011). In view of this Adedoja, Botha and Ogunleye (2012) support mobile learning as a better alternative to the e-learning model proposed above.

In order to ascertain the status of mobile learning in Nigeria, it is necessary to determine the status of mobile infrastructure in the country. The results published by Pyramid Research (2010) revealed that mobile services were in use by a significant proportion of Nigeria's population. They estimated the number of mobile subscriptions in the country to be 73 million resulting in a mobile penetration rate of 49% of the population. It was therefore suggested that due to intense competition and constant innovation from mobile service providers, a greater number of people would realize its value and be well positioned to make use of the full potential of mobile services in the near future. However, Pyramid research (2010) claimed that the adoption rate of mobile learning was very low.

Subsequently, Utulu and Alonge (2012) investigated the use of mobile phones for Project Based Learning (PBL) among privately own universities in the south west zone of Nigeria. It was shown that 95.9% (based on tables one and two below) of the respondents possessed mobile phones, which they used for communication, interactions, obtaining information, browsing the Internet, and sharing knowledge when they were involved in PBL – while 2.3% had no phones and 0.8% had lost their phones.

M-Learning Importance for Higher Education

There are many advantages of smartphones for learning which have significant impact on the higher education institutes in general. These advantages can be summarized as follows. The interactive dimension allows learners to practice and share their knowledge with each other rather than passively receiving it from big screens; using mobile devices in the classroom requires no special skills and makes learning easier than on desktop. Computers; E-memos and e-books are lighter and slimmer than files and textbooks or even laptops, Handwriting using pen-mail is a more intuitive approach than the keyboard and mouse, Sending and receiving

educational pictures or videos and MP3 files; Accessing information or services via the Internet; Making voice and video calls; Sending or receiving e-mails with image, voice, text and video attachments, Organizing notes and address books ;Sending or receiving SMS messages; These devices are cheaper than regular computers and more useful and affordable; These devices makes M-learning a cooperative environment through opportunities to access study materials, including formative means of assessment and feedback between students, and between student and lecturers (Abu-Al-Aish and Love, 2013; Chong, 2011; Kennedy, 2008; Nassuora, 2012).

In summary, the tablets and smart phones devices became more convenient for higher education student because it provides many of the fundamental requirements to deal with these devices in the tertiary institutions. These will be helpful to use these facilities to improve tertiary institutions online learning environment to assist the student in this stage.

Methodology

Research Design

The study used a descriptive research of the cross sectional survey type. This is an approach that seeks to explain the phenomena by using predetermined instruments to collect numerical data for analysis using statistical techniques and also using a certain population to represent the entire population. The approach is particularly suitable for this study because it allowed the researcher to measure the diverse views, perspectives, and opinions of lecturers' acceptance and adoption of M-learning technology for instructional delivery in tertiary institution.

Population of the Study

The populations for this study were lecturers in tertiary institutions in Nigeria while the target populations were all lecturers in tertiary institutions in Kogi State, Nigeria.

Sampling Techniques

The general sample size was drawn from lecturers in the seven tertiary institutions consisting of two Universities, two Polytechnics and three Colleges of education. Purposive sampling technique was used in selecting a University, Polytechnic and a College of education in the central senatorial district of the state. Altogether, three (3) tertiary institutions were used for the study. Therefore a total of 333 was obtained as the sample size.

Table 1: Population of Lecturers

Institutions	Total number of lecturers
Federal University Lokoja	873
Kogi State Polytechnic, Lokoja	611
Federal College of Education, Okene	310
Total	1, 794

Source: Establishment Unit of various institution

A total number of 1,794 lecturers was the target population in this study. The sample selection of the lecturers was based on Israel's model. The model posited that given a total population of N, if ±3% is taken as precision levels where confidence level is 95%, and P=5, the sample (n) should be X (Israel, 2003).

Table 3: Lecturers Sample Selection

Name of Colleges Lecturers	Total number of Lecturers	Sampled
Federal University Lokoja	873	161
Kogi State Polytechnic, Lokoja	611	114
Federal College of Education, Okene	310	58
Total	**1,794**	**333**

Method of Data Collection

The researcher and her research assistants sought the permission of the Heads and their representatives of the sampled schools involved in the research. The questionnaires were administered by the researcher with help from the two research assistants who were members of staff in some of the institutions that was used.

Data Analysis

In assessing lecturers' acceptance and adoption of M-learning technology for instructional delivery using questionnaire as an instrument, the statistical tools for this study were mean, t-test and ANOVA for analyzing the data collected. The questionnaire was coded and analyzed using Statistical Science Package for Social Sciences (SPSS) version 23.0 for windows. Mean was used to analyze research question one and two, t-test to test hypotheses one and two while hypotheses three and four was tested using ANOVA.

Results Discussion

The researcher sent out 333 copies of the questionnaire to lecturers in their respective institutions. Eight lecturers did not return their copies of the questionnaire, while 11 of the 325 copies retrieved were invalid. Hence, results presented in this chapter are based on an overall sample size of 314.

Table 4: Statistics of Lecturers that Responded to the Questionnaire

Name of Institution	Questionnaires sent out	Questionnaire returned
Federal University Lokoja	161	152
Kogi State Polytechnic, Lokoja	114	108
Federal College of Education, Okene	58	54
Total	**333**	**314**

Analysis of Research Questions

Research Question One: *Do lecturers accept M-learning technology for instructional delivery in tertiary institutions?*

To answer this question, lecturers were asked to rate their acceptance of M-learning technology. The section soliciting information on lecturers' acceptance of M-learning technology had 15 items, which were treated as a Likert scale. The responses of lecturers to each item were scored and collated to form a composite score. Thereafter, mean and standard deviation were computed. A mean score of 2.49 and below was rated as non-acceptance of M-learning technology while a mean score of 2.50 and above was rated as an acceptance of M-learning technology by lecturers.

Table 5: Mean responses of Lecturers for Acceptance of M-Learning Technology

Item No.	Item	N	Mean	SD	Decision
1	I will accept the use of M-Learning technology for instructional delivery.	314	3.3758	.68217	Acceptance
2	Given the technical know- how, M-Learning technology is easy to manipulate for instructional delivery	314	3.2516	.68560	Acceptance
3	Anytime and anywhere, mobile technology can be used for instructional activities	314	3.2197	.77467	Acceptance
4	I accept mobile phones as a tool for teaching	314	3.0382	.85636	Acceptance
5	I accept to use mobile technology for teaching	314	3.1210	.80216	Acceptance
6	I Accept that M-le enables me to achieve teaching tasks more quickly.	314	3.2898	.67976	Acceptance
7	The M-learning technology is compatible with other systems I use	314	3.0892	.79436	Acceptance
8	Mobile learning improves my collaboration with colleagues.	314	3.1688	.74141	Acceptance
9	I find M-learning technology very flexible	314	3.2070	.65807	Acceptance
10	Navigating with an M-learning technology is easy.	314	3.1242	.73731	Acceptance
11	I accept m-learning if it is recommended or made compulsory by the authorities	314	3.1146	.77886	Acceptance
12	I am looking forward to exploring with M-learning technology	314	3.2389	.62198	Acceptance
13	M-learning allows self-direction in teaching	314	3.2293	.66277	Acceptance
14	In teaching, I find it motivating to use M-learning technology.	314	3.1911	.63582	Acceptance
15	I will recommend others to use M-learning technology.	314	3.2006	.71130	Acceptance
1-15	**Cluster Totals**	**15**	**3.1907**	**.08532**	**Acceptance**

Table 5 reveals the Mean responses of Lecturers for acceptance of M-Learning Technology for instructional delivery in tertiary institutions. A cluster mean of 3.1907 indicated lecturers' acceptance of M-Learning Technology for instructional delivery in tertiary institutions

Overall, 294 (93.6%) out of the 314 lecturers accepted the use of M-Learning for instructional delivery while 20 (6.4%) lecturers did not accept the use of M- Learning technology for instructional delivery. This is graphically displayed in figure 4.1.

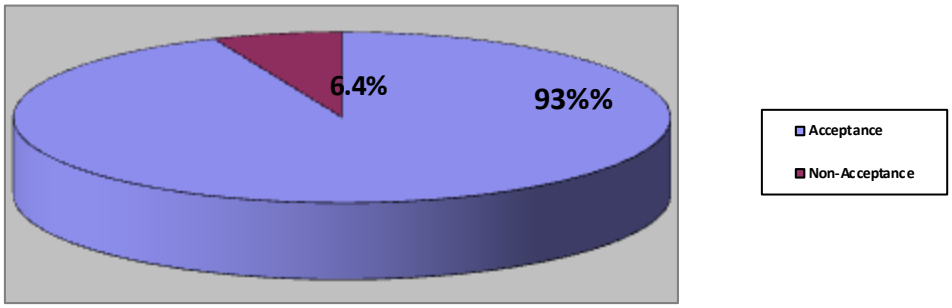

Figure 6: Lecturers' acceptance of M-learning technology for Instructional delivery in tertiary institutions in Kogi State.

Research Question Two (2)

Do Lecturers adopt M-learning technology for instructional delivery in Tertiary institutions?

To answer this question, lecturers were asked to rate their adoption of M-learning technology. The section soliciting information on lecturers' adoption of M-learning technology had 15 items, which were also treated as a Likert scale. The responses of lecturers to each of the 15 items were scored and collated to form a composite score. Thereafter, mean and standard deviation were computed. Lecturers with a mean score of 2.49 and below were rated as non-adopters of M-learning technology, while those with a mean score of 2.50 and above were rated as adopters of M-learning technology.

Table 6: Mean responses of Lecturers for Adoption of M-Learning Technology

Item No.	Item	N	Mean	SD	Decision
1	I am using M-learning technology in instructional delivery	314	3.0096	.87743	Adoption
2	I engage in collaborative teaching with mobile technology	314	2.9172	.82657	Adoption
3	I encourage other colleagues to adopt mobile technology for instructional delivery	314	3.1019	.72987	Adoption
4	Adopting M-Learning technology is voluntary	314	3.2898	.72963	Adoption
5	Adoption of M-Learning technology is useful in teaching	314	3.2771	.65649	Adoption
6	Adopting M-learning in teaching increases teaching productivity.	314	3.2293	.71829	Adoption
7	Generally, institutions should support the use of M-Learning technology	314	3.2516	.72192	Adoption
8	I have the resources necessary to use M-Learning technology	314	2.9204	.88835	Adoption
9	I will like to use M-learning if institution supports the use of it.	314	3.2038	.69905	Adoption
10	I find the M-Learning technology easy to use	314	3.0605	.76641	Adoption
11	I have the skills necessary to adopt the M-Learning technology for instructional delivery	314	3.1019	.75990	Adoption
12	It's easy for me to skillfully use M-Learning technology for instructional delivery	314	3.1115	.71295	Adoption
13	I will improve more in my use of M-learning technology in future.	314	3.2293	.69109	Adoption
14	I will use M-learning technology frequently in teaching	314	3.0924	.69301	Adoption
15	Adoption of M-learning improves my performance in instructional delivery.	314	3.2516	.68560	Adoption
1-15	**Cluster Totals**	**15**	**3.1365**	**.12339**	**Adoption**

Table 6 reveals the Mean responses of Lecturers for adoption of M-Learning Technology for instructional delivery in tertiary institutions. A cluster mean of 3.1365 indicated lecturers' adoption of M-Learning Technology for instructional delivery in tertiary institutions

Overall, 290 (92.4%) out of the 314 lecturers are adopters of M-Learning for instructional delivery while 24 (7.6%) lecturers are non-adopters of M-Learning for instructional delivery. This is graphically displayed in figure 4.2.

Figure 7: Lecturers' adoption of M-learning technology for Instructional delivery in tertiary institutions in Kogi State.

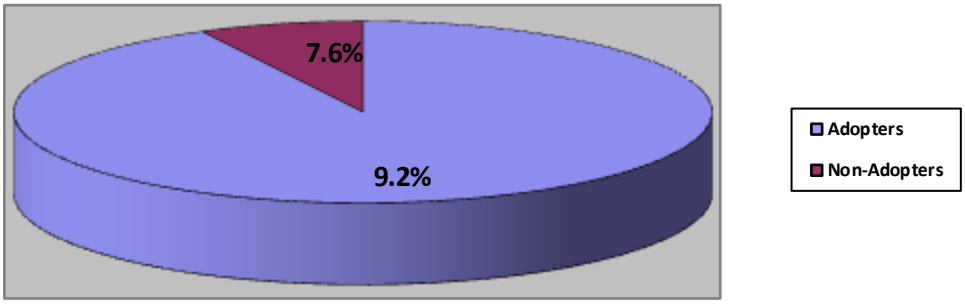

Figure 4.2: Lecturers' Adoption of M- learning technology for instructional delivery in tertiary institutions in Kogi State

Testing of Hypotheses

Hypothesis One

Ho_1: There is no significant difference between male and female lecturers acceptance of M-Learning technology for instructional delivery in tertiary institutions.

To determine if there is a significant difference between male and female lecturers' acceptance of M-learning technology for instructional delivery in tertiary institutions, an independent t-test analysis was carried out, at a 0.05 level of significance two-tailed. The summary of the result is presented in Table 7.

Female lecturers had a higher mean acceptance rate (M = 3.23, SD = 0.430) than male lecturers (M =3.16, SD = 0.452). The mean difference was not significant, t (312) = -1.234, p = 0.218. Thus, the null hypothesis is retained. That is, gender was not a moderating factor in lecturers' acceptance of M-learning technology for instructional delivery in tertiary institutions in Kogi State.

Table 7: Summary of t-test analysis of lecturers' mean acceptance of M-learning technology by gender

Gender	N	Mean	SD	df	Mean difference	t	Sig. (2-tailed)	Decision
Male	**180**	**3.16**	**0.452**					
Female	**134**	**3.23**	**0.430**	**312**	**-0.062**	**-1.234**	**0.218**	**Not sig.**

Hypothesis Two

Ho_2: There is no significant difference between male and female Lecturers adoption of M-Learning technology for instructional delivery in Tertiary institution.

To determine if there is a significant difference between male and female lecturers' adoption of M-learning technology for instructional delivery in tertiary institutions, an independent t-test analysis was carried out, at a 0.05 level of significance two-tailed. The summary of the result is presented in Table 8.

Female lecturers had a higher mean adoption rate (M = 3.20, SD = 0.435) than male lecturers (M =3.09, SD = 0.464). The mean difference was significant, t (312) = -2.133, p = 0.034. Thus, the null hypothesis is rejected. That is, gender was a moderating factor in lecturers' adoption of M-learning technology for instructional delivery in tertiary institutions in Kogi State.

Table 8: Summary of t-test analysis of lecturers' mean adoption of M-learning technology by gender

Gender	N	Mean	SD	df	Mean difference	t	Sig. (2-tailed)	Decision
Male	**180**	**3.09**	**0.464**					
Female	**134**	**3.20**	**0.435**	**312**	**-0.110**	**-2.133**	**0.034**	**Sig.**

Hypothesis Three

Ho_3: There is no significant difference in the Area of Specialization of lecturers' acceptance of M- Learning technology for instructional delivery in Tertiary institution.

To determine if area of specialization was a moderating factor in lecturers' acceptance of M-learning technology, a one-way analysis of variance was computed at a 0.05 level of significance. The results are presented in Table 9.

Table 9: ANOVA for lecturers' acceptance of M-learning technology based on area of specialization

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.594	2	.297	1.519	.220
Within Groups	60.827	311	.196		
Total	61.421	313			

The means and standard deviations are presented in Table 9. The analysis of variance indicates that there are no significant differences among the three areas of specialization, F (2, 311) = 1.519, p = 0.220. Therefore, the null hypothesis is retained. That is, area of specialization is not a moderating factor in acceptance of M-learning technology among lecturers in tertiary institutions in Kogi State.

Table 10: Mean acceptance of M-learning technology according to lecturers' areas of specialization

	Arts	Social Sciences	Sciences
Mean	3.1463	3.1556	3.2393
SD	0.5478	0.4458	0.4430

Hypothesis Four

Ho_4: There is no significant difference in the Area of Specialization of Lecturers' adoption of M-learning technology for instructional delivery in Tertiary institution.

The means and standard deviations are presented in Table 11. The analysis of variance indicates that there are no significant differences among the three areas of specialization, F (2, 311) =

2.015, p = 0.135. Therefore, the null hypothesis is retained. That is, area of specialization is not a moderating factor in adoption of M-learning technology among lecturers in tertiary institutions in Kogi State.

Table 11: ANOVA for lecturers' adoption of M-learning technology based on area of specialization

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.825	2	.413	2.015	.135
Within Groups	63.683	311	.205		
Total	64.508	313			

Table 12: Mean adoption of M-learning technology according to lecturers' areas of specialization

	Arts	**Social Sciences**	**Sciences**
Mean	3.1055	3.0827	3.1933
SD	0.5570	0.4448	0.3996

Summary of Findings

1. Lecturers in tertiary institutions in Kogi State accepted M-learning technology
2. Lecturers in tertiary institutions in Kogi State adopted M-learning technology
3. That gender was not a moderating factor in lecturers acceptance of M- Learning technology in instructional delivery in tertiary institutions in Kogi State
4. That gender was a moderating factor in lecturers adoption of M- Learning technology in instructional delivery in tertiary institutions in Kogi State
5. That area of specialization was not a moderating factor in acceptance of M-learning technology among lecturers in tertiary institutions in Kogi State.
6. That area of specialization was not a moderating factor in adoption of M-learning technology among lecturers in tertiary institutions in Kogi State.

Discussion of the Findings

The findings were discussed under the following sub headings:

- Lecturers acceptance and adoption of M-learning for Instructional delivery
- Influence of gender on Lecturers acceptance and adoption of M-learning for Instructional delivery
- Influence of area of specialization on Lecturers acceptance and adoption of M-learning for Instructional delivery

Lecturers' acceptance and adoption of M-learning for Instructional delivery

Finding on Lecturers acceptance and adoption of M-learning technology for Instructional delivery reveals that lecturers in tertiary institutions in Kogi State accept and adopt M-learning technology for instructional delivery. This is because M-learning technology plays an increasingly significant role in the development of teaching and learning methods for higher education. However, the successful acceptance and adoption of m-learning technology in tertiary institutions will be based on lecturers' acceptance of this technology.

This findings is in support of NNPIT; FRN (2001), which emphasized that, lecturers as trainers in tertiary institution have significant roles to play in all areas, it is necessary for all lecturers to be conversant with accept and adopt M-learning technology for instructional delivery

Influence of gender on Lecturers acceptance and adoption of M-learning for Instructional delivery

The findings reveal that gender had no influence on lecturers' acceptance of M-learning technology for instructional delivery in Kogi state. This buttressed the work of Fill and Brailsford (2005). However, it contradicts Chinyamurindi and Louw 2010, Okazaki and Renda dos Santos 2012 where they found gender as a moderating variable.

The presence of a gender divide was found to exist in the adoption of M-learning technology for instructional delivery in Kogi state, thereby contradicting other empirical studies (Agboola, 2013). This difference was in the direction of female lecturers. This finding agrees with the work of Schumacher and Moharan-Martin (2001), Shapka and Ferrari (2003), Oyelaran-Oyeyinka and Adeya (2004) and Teck and Lai (2011) that stressed the dominance of female in ICT related activities. But, it opposed the outcomes of Imhof, Vollmeyer and Beierlein (2007) and Bhattacharjee (2008) that reported the shrinking gender gap which seems as if it no longer exists. Hence, the issue of gender and ICT remains inconclusive.

Influence of area of specialization on Lecturers acceptance and adoption of M-learning for Instructional delivery

The result that arose from the analysis of this area indicated that all lecturers, irrespective of their areas of specialization accepted to adopt M-learning technology for instructional delivery. There were indications that the NPIT, FRN (2001), which emphasized that lecturers as trainers in tertiary institution have significant roles to play in all areas. But this indication does not have bias for areas of specialization. This finding supported the work of Oludipe (2004) but at variance with the studies of Alcuin (2006), Thomas and Mart (2006), Olumorin (2008), Agbatogun (2010) and Daramola (2011). This indicates that more studies need to be conducted in this area in view of variations.

Summary, Conclusion and Recommendations

Summary

This study assessed the acceptance, adoption and use of M-learning technology among lecturers of tertiary institutions in Kogi State. The study involved a sample of 314 lecturers drawn from public tertiary institutions (a university, polytechnic and college of education) in Kogi State. Data was collected using a structured questionnaire, which was analyzed using mean, t-test and ANOVA.

The major findings of this study are summarized as follows:

1. Most lecturers in Kogi State tertiary institutions accepted M-learning technology as a means of instructional delivery.
2. Most lecturers in Kogi State tertiary institutions adopted M-learning technology as a means of instructional delivery.
3. Gender was not a moderating factor for lecturers' acceptance of M-learning technology for instructional delivery in Kogi State tertiary institutions.
4. Gender was a moderating factor for lecturers' adoption of M-learning technology for instructional delivery in Kogi State tertiary institutions. Female lecturers adopt M-learning technology than their male counterparts.
5. Area of specialization was not a moderating factor for lecturers' acceptance M-learning technology for instructional delivery in Kogi State tertiary institutions.

6. Area of specialization was not a moderating factor for lecturers' adoption of M-learning technology for instructional delivery in Kogi State tertiary institutions.

Conclusion

Mobile devices are becoming popular as many people can afford them, currently the use of mobile communication devices has gone beyond the traditional communication role that it is now used in supporting teaching and learning. In education, M-learning technology has led to the evolution of new paradigm known as mobile learning (Muyinda et al, 2010). The rapid growth of access to mobile devices around the world and in Africa and Middle East regions in particular have a potential of improving teaching, learning and institutional efficiencies to enable national education system transformation (UNESCO, 2012). The conclusion derived from the study is that lecturers of tertiary institutions accept and adopt M-learning technology for instructional delivery. While gender is a significant influence in lecturers' adoption of M-learning technology, it is however not a determining factor in their acceptance as an instructional delivery tool and means. The decision to accept, adopt and continue to use M-learning technology is not dependent on lecturers' area of specialization.

The issue of gender had been a very volatile area for some time but recent findings which were earlier quoted have served as source of confirmation to the findings of this study. It was discovered that the entire variable used have signified no difference despite the purposive sampling of females. It must however be reflected under this discussion that the percentage of female is always lower to those of male in the staff strength of all the institution, reason for this could not be accounted for by this study.

Recommendations

Based on the findings of this study, discussions and conclusion drawn from it, the following recommendations were made:

1. Lecturers should be motivated and encouraged to incorporate the adoption of M-learning technology for instructional delivery in tertiary institutions by organizing of workshop through agencies such as TETFUND
2. Gender should be considered in the adoption of M-learning technology. Authorities of tertiary institutions should adopt strategies that are gender sensitive while planning to integrate M-learning technology in tertiary instructions' and in procurement of M-learning technology facilities if all lecturers must benefit from the present ICT revolution
3. Also, lecturers irrespective of their area of specialisation should be given equal opportunity and exposed to all possible avenues of M-learning technology in tertiary institutions. This would ensure that all the lecturers benefit equally from such.

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