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**Author(s):** Ifinedo, Eloho; Kankaanranta, Marja; Neittaanmäki, Pekka; Hämäläinen, Timo

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## **Exploring Nigerian University Students' Perception towards Mobile Learning**

Eloho Ifinedo,  
Department of Information Technology, University of Jyväskylä, Finland.  
eloho.e.ifinedo@student.jyu.fi

Marja Kankaanranta,  
Department of Information Technology, University of Jyväskylä, Finland.  
marja.kankaanranta@jyu.fi

Pekka Neittaanmäki,  
Department of Information Technology, University of Jyväskylä, Finland.  
pekka.neittaanmaki@jyu.fi

Timo Hämäläinen  
Department of Information Technology, University of Jyväskylä, Finland.  
timo.k.hamalainen@jyu.fi

**Abstract:** The specific objective of this study was to better understand Nigerian university students' perceptions and readiness towards mobile learning. Recently, the influence of mobile technology is seen to have infiltrated everyday life and the learning institutions. It is thus crucial for learning institutions to assess and understand the factors advancing the mobile learning adoption. This study offers some important insights into mobile learning adoption especially in developing countries like Nigeria. Data for this study were collected using a survey. Undergraduate students at two Nigerian universities (N=135) were non-randomly allocated to respond to a survey. Overall, the results reveal the existence of the widespread use and ownership of a mobile phone by the Nigerian students. Also deduced, is that a good number of the courses require the use of internet for completion of course assignments. Therefore, we recommend that course resources should be designed for delivery through a mobile device.

### **Introduction**

Learning in institutions has been shaped as well as influenced by the various types of technology that have been witnessed in the past and present. During recent years, especially the potential of portable wireless device (i.e. laptops, tablets, smartphones and other portable electronic devices) for enhancing and diversifying learning has received increased attention. Literally, this concept is called mobile learning or m-learning (Leung & Chan, 2003; Litchfield, Dyson, Lawrence, & Zmijewska, 2007; Costabile et al., 2008)). It is predicted that the predominance of mobile phone and its importance will outnumber the use of personal computers (Motiwalla, 2007; Sharples, Taylor, & Vavoula, 2005) and other previous technologies (Kalba, 2008). It is therefore crucial for learning institutions to assess and understand the factors advancing the mobile learning adoption.

Despite the rapid development in technology, extant literatures reveal limited information on technology integration in schools of learning in Nigeria. An increasing number of studies were found on m-learning with most of them being conducted in the USA, Asia, Britain, Scandinavia, and Australia (Litchfield et al., 2007; Sergis, Sholla, Zervas, & Sampson, 2014; Serrano & Yang, 2013; Jiranantanagorn, Goodwin, & Mooney, 2012). As the mobile learning trend is observed in other continents of the world, it is important to investigate the digital inclusiveness of the African continent. According to Avgerou and Madon (2005), digital inclusion can be achieved when the gap between each person's competences at integrating technology into learning is bridged. From the point of view of this study, a successful adoption of mobile learning should be built on students' perception towards m-learning, in other words, information concerning students' ownership of the mobile devices, students' technical skill and practices.

Hence, this study seeks to investigate the state of preparedness of the Nigerian universities for mobile learning. The study attempts to bring to light the relative association or similarities existent across various courses of

study (departments), sexes, age and other variables. The willingness of the students to use their mobile phones for instructional learning is also explored. In this regard, the questions to be answered are:

- What type of mobile devices do the university students possess?
- Are the students aware of mobile learning?
- Do the students have technical skills for mobile learning?

Thus, this study offers important insights into mobile learning adoption especially in developing countries like Nigeria. This paper is organized as follows. First, the m-learning literature is reviewed followed by a discussion of the context of the Nigerian education and technology. After this, the research methodology is described, including a discussion of the sample the variables and their measurement. Finally, the results are presented, followed by a discussion of the findings and the paper is concluded with reflective remarks.

## **On Mobile Learning**

In the technology era, the acquisition of knowledge is depicted as a process that is mediated by the device. The emerging technologies pave the way to the progress of numerous prospects that enhance the learning process in such a manner that was not possible before now. According to UNESCO (2012), the affordances of the technology offers not only possibilities for new experiences and learning but also places demands for acquisition of new skills such as computational thinking, problem solving, innovative product creation, collaborators, effective communicators. In addition, technology has provided opportunities for communication and by extension made the learning experience better (Sharples, 2000; Fuller & Joynes, 2015). The traditional ways of classroom lectures, acquiring information through the use of books at the library has been made easier in higher institutions of learning by the advent of electronic learning or e-learning.

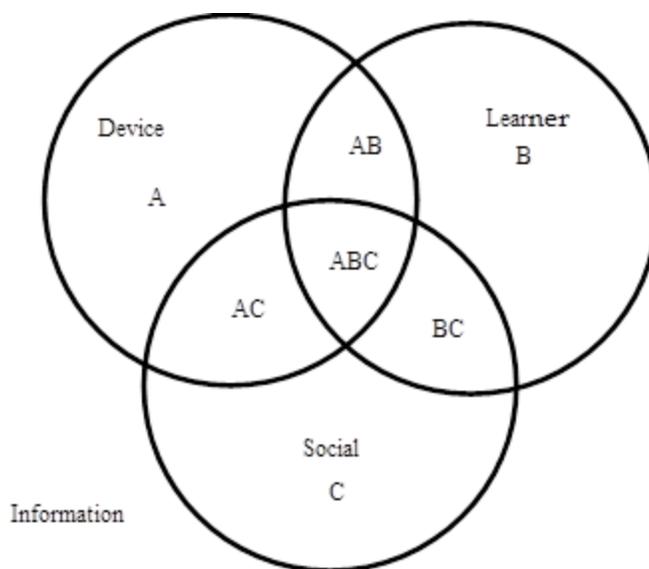
In recent times, the evolution of the mobile technologies which comes in various shapes, sizes and functionalities has further potentials for learning in various ways. For example, while a mobile phone which possesses several capabilities and functionalities is basically for communicating, mobile learning aims at optimizing these properties in a learning environment. Literarily, mobile learning is the use of portable wireless device for learning however, a number of definitions are provided for mobile learning in various scholarly articles. Leung and Chan (2003) define mobile learning as the point at which mobile computing and electronic learning intersect to produce anytime, anywhere learning experience. Litchfield et al., (2007) define it as the facilitation of learning and access to educational materials for students using mobile devices through a wireless medium. Costabile et al., (2008) also affirm that the combination of e - learning and mobile computing is called m - learning. In these definitions, it can be observed that the availability of the appropriate mobile device, the access to the wireless network, the need to acquire knowledge within varied context and appropriate pedagogy that culminates in the m-learning experience.

M-learning shares the same benefits with E-learning as they both afford the learner the flexibility of studying anywhere, any how and any time with the use of portable wireless technologies. Motiwalla (2007) maintains that, 'it is facilitated by a convergence of Internet, wireless networks, mobile devices and e- learning'. The portability of the device and the technology enables the learner take advantage of breaks or spare time such as lunch periods to seek out information. The desire for information can therefore be fulfilled as it arises instead of for instance, delaying till there is access to computer or arrival at the nearest library. Koole (2006) regards the portability feature of the device as an enabler to the process of accessing information such that with m-learning, the information moves to the learner instead of the learner moving to the information. Thus, mobile learning is depicted as a situation in which the mobile device (commonly used are laptops, tablets, smartphones and portable electronic devices to name but a few) acts as a facilitator in the learning process. In this paper, the device is seen as the tool which acts as the focal point that reconciles all forms of learning activities, experiences and explorations. Thus, this study is based on the social constructive theories which project learning as a social activity that is focused on the learner and the mobile phone as a tool for communication which provides a platform for feedback.

Koole (2006) provides a comprehensive framework for mobile learning. The Framework for the Rational Analysis of Mobile Education (FRAME) model was built as the thematic bedrock for evaluating the efficiency of the integration of mobile devices for learning. It provides an explanation of the procedure involved in the mobile learning process and it is based on the perspective of information as the learning environment within which the learner is situated. The model (figure 1) is made up of three parts represented as circles (device A, learner B, and social C) in a Venn diagram. The combination of all individual aspects (A, B, C), their primary intersections (AB, BC, AC, ABC) and the information context offers a depiction of what mobile learning is. Their intersections, Device Usability (AB) refers to the point at which the student begins to manipulate the device to execute learning tasks. In this sense, a blend of attributes such as portability, functionality and satisfaction are at play. Social Technology (AC)

mirrors the students and the technology and in this case attributes like collaborative tools, interactions are at fore. Lastly the Interaction Learning intersection (AC) considers external influences on the learners as well as their influences on one another illustrated by learning theories.

In this study, this framework is considered to be extensive since it explains elements that are learner centered and provides a basis for theories of learning and instruction found in the social constructivist philosophy. Nevertheless, due to constraints in time, resources and the fact that this study is in an exploratory phase, all aspects of Koole's model are not captured. Besides, it emphasizes that the learners should be the core focus for a successful implementation of m-learning. As such, the assumption is that the students require the skills to access relevant information at the time of need through mobile devices. This implies that the availability of the mobile device and wireless connectivity are necessities for the students in order to consider the integration of technology into education.



**Figure 1:** Adapted from Koole's FRAME Model (2006, pg 33)

## **Nigeria: Development in Education and Technology**

As at 2015, Nigeria's population was estimated at about 182.2 million (World Bank, 2016). According to Worldometer (2016), this is 2.48% of the world's population. The country occupies a landmass of about 923, 768sqkm and with a total of about 274 ethnic groups. World Bank (2016) asserts that Nigeria accounts for 47% of the West African population and about 20% of the Sub-Saharan Africa population.

Education is seen as an economic driver towards development of any nation but the challenge of affordable education for the Nigerian populace in the midst of decreasing national resources and the increasing growth of the population is quite high. National University Commission (NUC, 2016) maintains that Nigeria presently has 152 universities: 40 Federal universities, 44 state universities while 68 are privately owned. This figure does not include tertiary institutions such as Colleges of Education, Polytechnics and Monotechnics. Beside, there has been higher demand for university education than can be catered for by the number of universities available in Nigeria. Oyewole (2010) suggests that the swift increase in the private and distance tertiary institutions of learning in Africa in the last ten years is partly due to the increasing population and quest for education which has surmounted the resources available in current public institutions.

In terms of technology development in Nigeria, the history of telecommunication services in the country begins in 1886 (Ajadi, Salawu, & Adeoye, 2008) and became well known in era of the then colonial government. As at December 2014, the subscriber data reflects that there are approximately 139.1million connected lines comprising of mobile GSM, mobile CDMA and fixed wire/ wireless (Nigerian Communications Commission (NCC), 2016).

In 2014, the number of mobile phone holders in Africa was estimated at 700million and this is more than in the United States and Europe (ITU, 2014; AFD & UNESCO, 2015). With a population of about 936 million and growth rate of 2.4% per year, the Sub-Saharan Africa is notably the region with the highest population growth in the world. However, the number of internet users in the region lags behind the world average when compared to Asia,

the Pacific and Arab world. (Agence Francaise de Developpement, (AFD) & UNESCO, 2015). The influence of the mobile industry, has led to significant coalitions in Africa. Coalitions such as mobile banking (for example mPESA in Kenya), mobile health (for instance MoteCh in Ghana, MPedigree in Sub-Saharan Africa), mobile education (Tangerine system in Kenya), mobile farming (Used in Niger). A few other programmes worthy of mention are American One Laptop per Child (OLPC), Classmate PC by Intel group and Computer for School in Kenya (CFSK), (AFD & UNESCO, 2012). As a result of the opportunities that access to mobile technology offers, traditional methods of teaching and learning now begin to evolve while building on the ownership of the mobile devices. UNESCO (2012) reports on mobile learning projects used to support classroom teaching and curriculum delivery in South Africa, Tanzania and Mali. However, based on eight countries within the sub-Saharan Africa (the Democratic Republic of Congo (DRC), Ghana, Kenya, Malawi, Mauritius, Mozambique, Tanzania and Uganda), Bon (2010) recounts the current state of access to ICT in tertiary education and identifies that constraints which are political, financial and structural are acting as impediments.

The advent of wireless network in Nigeria presents a welcoming platform towards the integration of technology in the institutions of learning. M-learning also provides an attractive solution to the high demand for education in the country. Some studies within the Nigerian context have concentrated on the benefits and challenges of mobile learning. For example, it is advocated for nomadic education programmes by Aderinoye, Ojokheta and Olojede (2007). Similarly, Osang, Ngole and Tsuma (2013) look at the issues in relation to m-learning for Open University and distance learners. This paper aims at examining the perception and practices of university students towards mobile learning and the associated concerns which maybe characteristic to Nigeria and the sub-Saharan region at large. Therefore, from the point of view of this study, a successful adoption of mobile learning should be built on information concerning students' ownership of the mobile devices, students' technical skill and practices.

## **Method**

The purpose of this study was to explore the readiness of the Nigerian university students in anticipation for mobile learning adoption. The study served as a pre-study for providing understanding of the prevailing status of mobile learning among the university students.

## **Participants**

The participants were 135 non-randomly selected undergraduate students from two southern federal Nigerian universities. The study cuts across students from different years of study, gender, age group and departments. The bias in this study is for undergraduate university students in Nigeria and as a result, it excludes students of polytechnics, colleges of education, private universities, already graduated or in postgraduate studies.

## **Instrument**

In order to achieve the objective of this study, data was collected using a survey consisting of twenty - five questions based on the works of Motiwalla (2007) albeit with some modification. The survey comprised of 6 main themes namely, mobile phone ownership (3 questions), skill (2 questions consisting of 7 sub-questions), internet access (6 questions), attitude towards social networking sites (1 question consisting of 4 sub-questions), travel history (3 questions), lastly, the students' awareness of mobile learning and willingness to use their mobile device for learning (2 questions). In terms of the students' skill, the questions were designed to understand their disposition towards the use of email, word processing, internet surfing, software downloads and navigating the internet to obtain information. Information on their access to the internet was obtained by examining what type of device was used, the frequency and the need for such access in relation to course assignments. Data on the students travel history was gathered using questions related to their mode of transportation, the duration and frequency of travel. Some questionnaires were distributed to the respondents and response was collected almost immediately while a few others were collected a few days after.

Overall, the administration of the questionnaire was done within a period of 3 weeks in each school at different departments and lecture halls and the participants in the survey were informed on the aim of the study. It was originally intended that both the self-administration and on-line method of survey be employed in this study. However, as a result of envisaged low response rate and the limited time available for the study, self-administration of the questionnaire through gatekeepers appeared more advantageous in terms of response rate. Initially, 170 questionnaires were sent out and 140 received after completion. Five of the 140 collected questionnaires were eventually rejected as the respondents were graduates and therefore did not qualify for inclusion in the target

population. The difference of 30 questionnaires fell into the category of badly filled (10 questionnaires) and unreturned (15 questionnaires). A high response rate was found in this study to be 79.4%, this ensures a representativeness of the wider population from where the sample has been drawn. (Buckingham & Saunders, 2004)

**Data Context**

Some of the variables used in this study needed to be further categorized to enable data analysis. An example is the area of course of study where a number of departments and courses had to be grouped together into a single faculty. The faculties were grouped into six categories which are Engineering, Medicine, Agriculture, Art and humanities, Sciences and Social sciences.

Variables	Participants	Percentage (%)
Total sample size	135	100
University A	57	42
University B	78	58
Faculty		
Engineering	16	12
Medicine	12	9
Agriculture	16	12
Social Sciences	9	5
Sciences	62	46
Art and Humanities	21	16
Gender		
Male	73	54
Female	57	42
Age group		
≤18	19	14
19 - 22	68	50
23 – 26	43	32
27 - 30	1	0.7
Study Year		
Year 1	13	9.6
Year 2	51	38
Year 3	25	18.5
Year 4	29	21.5
Year 5	15	11
Others	1	0.7

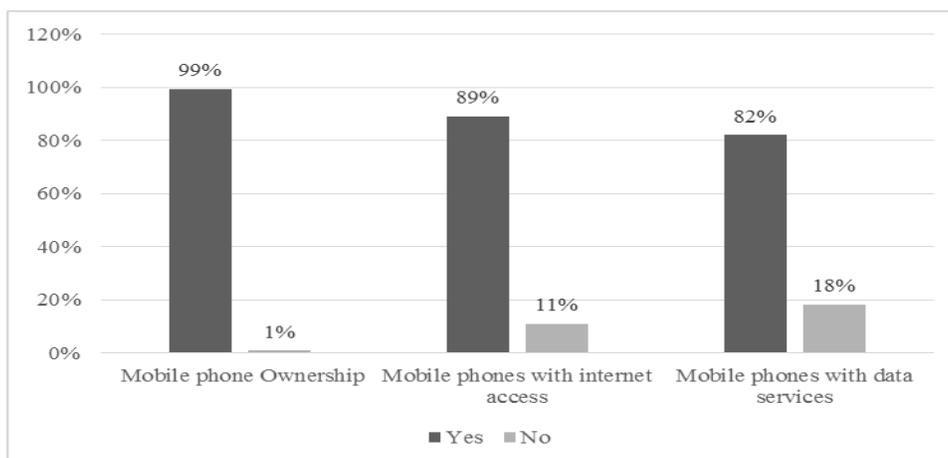
**Table 1:** Data Variables of the Study

**Result**

Next we offer the outcome of the main questions and themes that this study aimed to answer. The results are presented using charts and measures of central tendency to enable comparison and upfront comprehension (Bryman, Bell, Mills, & Yue, 2011).

**Type of Mobile Devices Owned by Students**

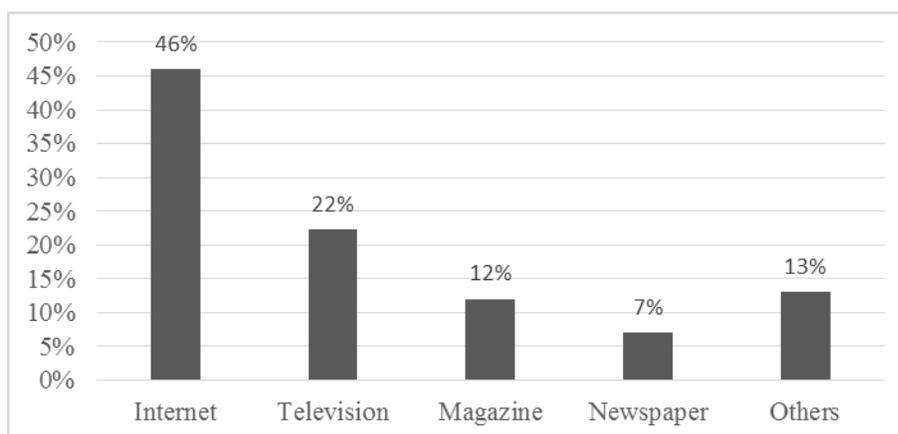
The result revealed that of the 128 students who answered the question, 99% own a mobile phone (Figure 2). In addition, 89% of the students owned mobile phones with which they could access the internet while 82% of the students could access data services.



**Figure 2:** Students' Ownership of Mobile Phones

### Students Knowledge of Mobile Learning

In response to the students awareness regarding mobile learning (see figure 3), a descriptive analysis reveals that 58% of the participants (N= 74) heard previously about mobile learning whereas, 42% had not. The internet ranked the most predominant medium of obtaining this knowledge with 46%. Subsequently, the television was 22% and magazine was 12%. Further, 93% (N= 126) were favourably disposed towards using their mobile phones for learning.



**Figure 3:** How They Learnt about Mobile Learning

### Students' Skill

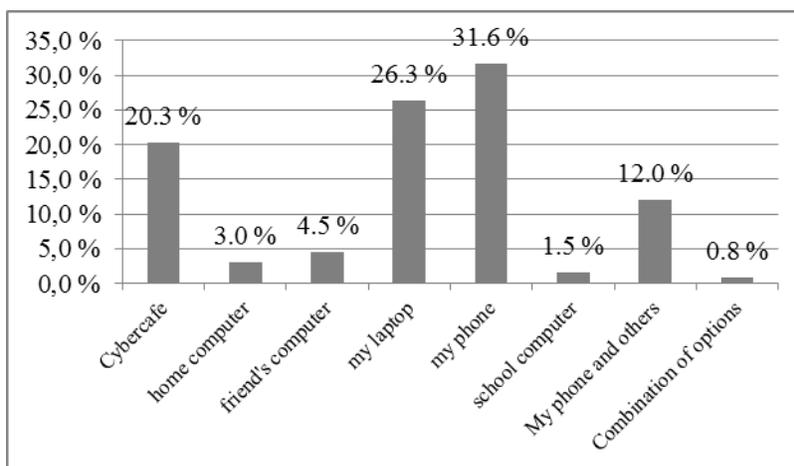
From the descriptive analysis of the result (table 2), it was observed that the mean ranged between 3.63 and 4.24 for all cases. A greater number of participants had skills in internet surfing. Those with very good skill were 36.2% (N = 130) while those with good skill were 29.2% and 28.5% had average skill. The majority of the students also were confident of their ability to navigate and obtain information from the internet with 88.5% (N = 122).

Skill \	N	Range	Minimum	Maximum	Mean	Std. Deviation
Word processing	134	4	1	5	3.67	1.095
Use of email	133	5	0	5	3.93	1.031
Internet surfing	131	4	1	5	3.94	0.983
Software downloading	132	4	1	5	3.63	1.327
Use of Internet is clear and understandable	126	4	1	5	4.24	0.862
Navigate and Obtain Information from Internet	123	4	1	5	4.18	0.897
Internet is easy to use	126	4	1	5	4.14	0.953
Valid N (list wise)	119					

**Table 2:** Descriptive Statistics of Skill

### Internet Access and Use

From the response to the survey, 51.2% (N= 127) claimed they require the use of the internet in 4 and more courses for completion of assignments. When the results were compared with respect to their individual faculties, it was observed that the students from the social science, the art and humanities faculties' believed they require the use of the internet for completion of course assignments for less than 4 courses. In addition, the most common mode of access to the internet (see figure 4) was through the use of their phones (31.6%; N= 133), followed by their laptops (26.3%), then through cyber cafes (20.3%). Only 1.5% was found to access the internet through the use of their school computer.



**Figure 4:** Mode of Internet Access

### Attitude to Social Networking Sites

The result showed that 94% of the participants (N = 133) use such sites. While 91% (N = 133) admit that they use such sites in order to connect with people and 76% (N=131) acknowledge the fact that they use such sites to keep in touch with events. However, about 36% (N = 132) of the respondents accept that among other reasons, they also use such sites because others use it. These details are presented in figure 5.

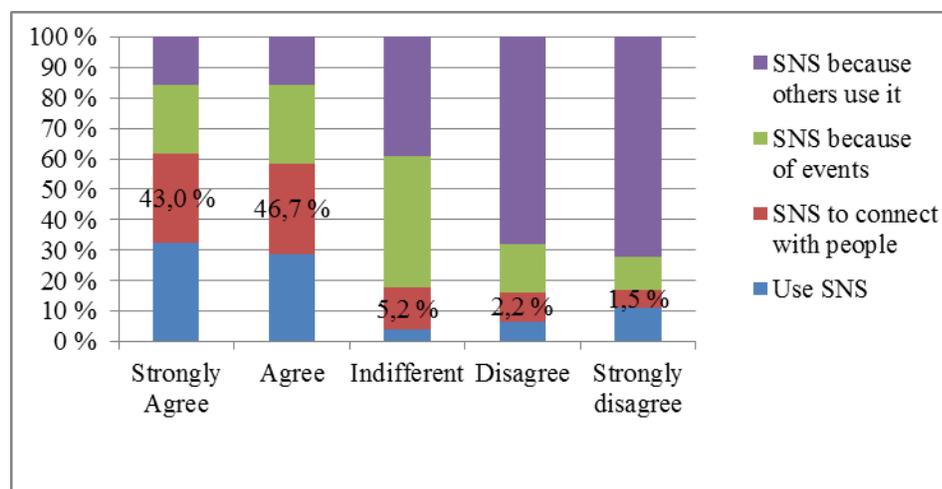


Figure 5: Attitude towards Social Networking Sites

### Travel History

Most students represented as 47% travelled to school by bus (N = 134) and 48 % (N= 125) made these trips twice a day. However, 60.8% (N =125) spent less than one hour on such trips.

### Conclusion

The result of this explorative study provides support for mobile learning in terms of the observed widespread ownership of the mobile device by the students and their general positive disposition. The device focused on was a mobile phone that is able to access the internet. The findings appear to be consistent with Koole's (2006) framework from the view point of the device availability which highlights the students' potentials in manipulating these devices towards course objectives. Also, the prospect of their co-construction of knowledge based on future collaborations among themselves as seen in their favorable disposition towards interactive activities (for example, social networking sites) and willingness to engage in mobile learning. Besides, a number of the courses required the use of internet for completion of course assignments and a high percentage of the students in this study obtained information about m- learning from the internet which confirms the desire for information. The key benefit of m- learning is observed in the ability to obtain information that is suitable and meets the timely need. Education stakeholders should consider pedagogies that promote learning activities which involve for example, sharing and collaboration using suitable technologies. The result further attests to the current trend in the ubiquitous use of the mobile device in developing countries especially in the sub-Saharan Africa (Sharples et al., 2005). Thereby supporting the argument put forward by Litchfield et al., (2007) that the students ownership of and readiness to use their own mobile device is a critical success factor in the implementation of m- learning. This may be valid because, it phases out the issue of cost of providing the device for the students and resolves the issues concerned with usability which was identified as a challenge to m- learning in a study by Corlett, Sharples, Bull and Chan (2005). In the same study, Corlett et al., (2005) confirm the significance in owning the mobile device as they observed that the students having been loaned PDAs, were found to be unenthusiastic in devoting time and money in personalizing and extending the device. Zhang et al., (2010) maintains that the ubiquitous technology has resulted in a growing enthusiasm among educators with regards to exploiting the benefits of m- learning.

With regards to travelling history, a good number of students in this study spend less than an hour at least twice in a day. Nonetheless, there are different learning activities that can be designed to fit various time frames while bearing in mind that it is difficult to delineate learning from other everyday activity but rather it should be incorporated in various non-learning activities (Sharples et al., 2005). Travelling time was referred to as *dead time* by Fuller and Joynes (2015) and in their research, they affirm that students' optimization of such opportunities for learning led to significant changes in their work placement. Nevertheless, the findings appear to be consistent with the report by UNESCO (2015) which claims that the use of ICT in education remains at the developing stage in most sub-Saharan countries.

As increasing development of technology continues to define the future, it is imperative that educational practices align with this trend. This study surveyed the students' ownership of mobile devices, their awareness and intent to use their devices for m- learning. Based on the findings revealing widespread ownership of the mobile device, the necessary skill and willingness to embrace mobile learning, we recommend that course resources should be designed for delivery through the mobile device. In addition, it is pertinent to choose or adopt suitable pedagogical approaches to learning activities that are appropriate for use considering the types of mobile devices owned by the students. The limitation of the study is such that the sample comprised undergraduates of two federal universities in the southern part of Nigeria.

Future research can examine the preparedness for m- learning in state universities, secondary schools or other institutions of learning in other regions of the country. In addition, since the focus of this study was solely students' perspective, the authors intend to further investigate the view of the teachers, their skills and attitude towards m – learning in the Nigerian universities.

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