

## **Individual And Technological Factors Affecting Undergraduates' Use Of Mobile Technology In University Of Ilorin, Nigeria**

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### **Abstract**

The proliferation and utilization of handheld mobile technology among undergraduates for mobile learning cannot be underestimated. This study was geared towards investigating individual and technological factors affecting the perceived usefulness of mobile technology by undergraduates in university of Ilorin, Nigeria. The study was a descriptive research of the survey type. Samples were randomly drawn from all students in the 15 faculties. A total of 100 undergraduates were sampled. Two research questions, and one hypothesis were answered and tested respectively. Mean was used to answer the research questions while Pearson Product Moment Correlation (PPMC) was used to test the relationship between the technological and individual factors. Findings from the study revealed that the technological and individual factors positively affected the perceived usefulness of mobile technology for learning among undergraduates. Also, there was a positive relationship between technological and individual factors that affected perceived usefulness of mobile technology. Based on the findings, it was concluded that both the individual and technological factors affected the perceived usefulness of mobile technology for learning positively. It was recommended that students should be encouraged in the use of Mobile technology devices for learning.

### **Keywords**

Education; ICT; Mobile Learning; individual factor; Technological factor

## I. Introduction

Technology has changed educational landscape due to how information is delivered and to whom the information is delivered to, the speed of access to information, and the choice of options for learning (Truluck, 2005). Since new technologies are evolving, different ways of learning like mobile learning with the use of mobile technology are also gaining popularity. In recent years, a concerted effort has been made to introduce modern technologies into the school curriculum as part of the efforts which include the use of modern technologies like computers, internet, multimedia, communication technologies as well as the creation of suitable educational software.

Studies have shown that the use of modern technologies such as the mobile technologies considerably influence effective teaching and learning. The mobile technologies at school learning influence individual and technological factors related to the students' personality while using the modern technologies in educational practice (Benson, 2004; Hsioung, 2002; Roussos, 2002). Mobile technology is seen as; any device or facility that supplies a learner with general electronic information and educational content that aid acquisition of knowledge regardless of location and time (Chen and Kinshuk, 2003).

A small handy device, computing device, which usually comes with display screen and also accompanied with touch input and/or a miniature keyboard and usually weighing less than 0.91 kg are used for mobile technology. The National Institute of standards and technology [NIST] (2014) described mobile devices as tools that are usually small and handy, that can access at least one wireless network interface, support applications of web browsing and third party, run an operating system that is not a full-fledged desktop/laptop OS, possess a minimum of one digital camera or video recording tool, contain a microphone, storage support and synchronization with other devices. Some of these mobile devices are more powerful, they allow you to do many things which can also be done on the desktops and laptops ( Goodwill Community Foundation [GCF], nd).

Mobile technology, with its persuasive acceptance and powerful functionality, is inevitably changing people's behaviours. In fact young adults are especially dependent on mobile devices in the contemporary; CourseSmart (2011) revealed that university students cannot do without their mobile devices, including smartphones, laptops and more. It's very common to see university students checking email, Facebook, Twitter, or other social network sites using mobile devices with their constant web connection feature nowadays.

Mobile technology tools are the result of two converging technologies: computers and mobile phones. Numerous platforms are available, each with its own advantages, technical specifications and cost. A wireless laptop computer offers the greatest capabilities, including maximum storage and a standard PC platform that enables conventional e-learning and web content. A tablet computer having full computer capabilities without the keyboard has been found to be successful for teaching and learning visual subjects. A personal digital assistant (PDA) and Pocket PC are portable and can have many additions, but might not be compatible and thereby incur high costs (Workshop Report, 2005).

Traxler (2007) stated that there were six areas of emerging technologies that will significantly have impact on education through mobile technology. These include, clouding computing, use of Geocoded data, personal web tools, semantic aware applications, smart objects that give ordinary objects the power to recognize their physical location and respond appropriately, and mobile devices. With a rapid deployment of mobile technology, mobile learning gives rise to new possibilities for extending learning opportunities (Lam & Chung, 2009).

The potentials of mobile technology in education cannot be over- emphasized. In addition to telephones, modern mobile devices also support a wide variety of other services which include text messaging, multimedia system, email, Internet access, short-range wireless communications (infrared, Bluetooth), business applications, gaming and photography. Mobile phones that offer these and more general computing capabilities are referred to as smartphones. Smartphones combine telephone

capabilities with a PDA (Personal Digital Assistant), Camera, Video, Mass storage, MP3 player, internet access, and networking features in one compact system (Corbeil & Corbeil 2007). Walker (2006) stated that mobile technology provide opportunities for students to rehearse oral presentations take quizzes, shoot photos for class projects and create podcasts.

The major advantages of mobile technology in education include greater access to appropriate and timely information, reduced cognitive load during learning tasks, and increased interaction with other people and systems. It may be argued that networked mobile devices can help shape a culturally sensitive learning experience that can offer additional and, possibly, more powerful means of encoding, recall, and transfer (Koole & Ally, 2001). The disadvantage is that not all data, which are available on the web, are suitable for some beginning courses. Students may not have acquired sufficient knowledge of a particular field necessary to use available data sets, although these data sets are suitable for many advanced undergraduate courses.

The mobility of technology describe the ubiquity of the mobile devices such as smartphones, digital cameras, media players, iPods and personal digital assistance devices (PDAs). The mobility of the learners respect the fact that learners are not only remote from their instructors, but they have the full freedom of controlling fully their access of information on their mobile devices, which is done independently. Supporting this view, Uden (2007) opined that mobile technologies offer new opportunities for students' educational activities in that they can be used across different locations and times. The mobility of learning views learning processing from a contextual point of view. "The context is utterly individual – completely different from the rigid outlay of the traditional classroom or lecture room, and the computer laboratory" (El-Hussein & Cronje, 2010, p. 19)

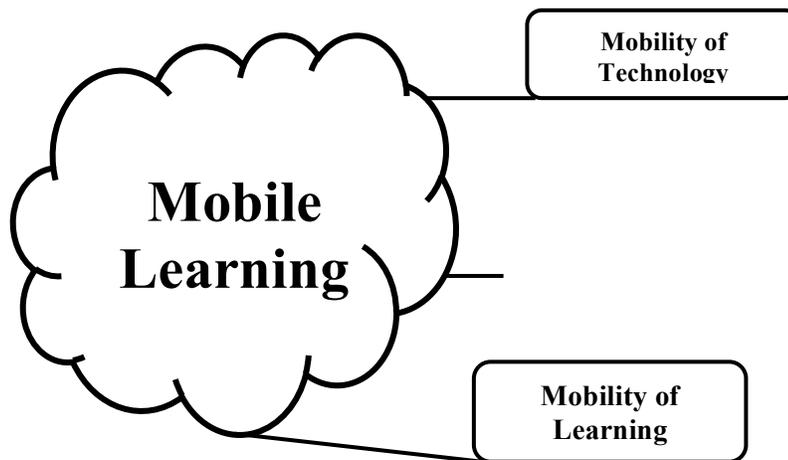


Figure 1: The three concepts of mobile learning

### a. Classifications of Mobile Technology For Learning

In understanding the real concept of using mobile technology for learning, Traxler (2009) opined that classifying the mobile learning can help tackle the problem of definition from different direction. Traxler (2009) therefore classified mobile learning through the use of technology into the following:

- i. Technology-driven mobile learning – a specific technological innovation is deployed to demonstrate technical feasibility and pedagogic possibility, perhaps the new iPhone
- ii. Miniature but portable e-learning – mobile, wireless and handheld technologies are used to re-enact approaches and solutions found in conventional e-learning, perhaps porting an established e-learning technology onto mobile devices.
- iii. Connected classroom learning – the same technologies are used in a classroom setting to support static collaborative learning, perhaps connected to other classroom technologies; personal response systems, graphing calculators, PDAs linked to interactive whiteboards and others.
- iv. Mobile training and performance support – the technologies are used to improve the productivity and efficiency of mobile workers by delivering information and support just-in-time and in context for their immediate priorities, roles and duties
- v. Large-Scale Implementation – the deployment of mobile technologies at an institutional or departmental level to learn about organisational issues
- vi. Inclusion, assistivity and diversity – using assorted mobile and wireless technologies to enhance wider educational access and participation, for example personal information management for students with dyslexia
- vii. Informal, personalised, situated mobile learning – the same core technologies are enhanced with additional unique functionality, for example location-awareness or video-capture, and deployed to deliver educational experiences that would otherwise be difficult or impossible; for example informal context-aware information in museum spaces
- viii. Remote, rural and development mobile learning – the technologies are used to address environmental and infrastructural hurdles to delivering and supporting education where 'conventional' e-learning technologies would fail. (Traxler, 2009, pp. 3-4)

### b. Statement of the Problem

The 21<sup>st</sup> century advancement of technology and computing is ushering in an era of mobility, an era whereby users can have easy access to computing anywhere, anytime via the use of smaller and more powerful portable devices, expanding coverage for wireless and cellular networks, and a flourishing pool of applications that take advantage of these technologies promise that one day, most things you can do at a desktop computer—and some things that you can't—will be possible from a mobile device (EDUCASE, 2010).

Mobile devices are made in a wide array of sizes, designs, capabilities and functionalities, using the cellular networks and Wi-Fi or a combination of the two, they also possess touch-screen for easy user interface display. They run on diverse Operating Systems (OS), and support for software built on Java and Flash (Livingston, 2004; EDUCASE, 2010). It is no surprise however, how the mobile technology is the fastest spreading technology of the 21<sup>st</sup> century, making a population of over six billion subscribers worldwide (Regalado, 2013).

Mobile technology devices such as cell-phones, tablet computers, iPods among others are beginning to revolutionize education as mobile learning becomes another paradigm shift in teaching and learning process. Goad (2012) stated that the use of mobile technology, specifically cell phones, tablets computers, iPods and laptop (the most ubiquitous piece of technology in the world) as instructional tools to engage students in learning will be of immense benefit.

Most of the earlier studies focused on students' and teachers' perception and attitude towards the use of mobile technology for teaching and learning which indicate that none of these studies known to the researchers focused on the individual and technological factors that influence the use of mobile technology. It is based on this background that this study identified technological and individual factors affecting undergraduates' use of mobile technology in university of Ilorin, Ilorin Nigeria.

### **c. Purpose of the Study**

The main purpose of the study was to examine the technological and individual factors affecting use of mobile technology for learning among undergraduates in University of Ilorin. Specifically the study investigated:

- i. Technological factors affecting undergraduates' use of mobile technology for learning in University of Ilorin Nigeria.
- ii. Individual factors affecting undergraduates' use of mobile technology for learning in University of Ilorin Nigeria.

### **d. Research Questions**

The following research questions were answered in the course of the study.

- i. What are the individual factors that affect undergraduates' use of mobile technology for learning in University of Ilorin?
- ii. What are the technological factors that affect undergraduates' use of mobile technology for learning in University of Ilorin?

### **e. Research hypotheses**

The only hypothesis in the study was tested at 0.05 level of significance

$H_{01}$ : There is no significant relationship between the individual and technological factors affecting undergraduates' use of mobile technology for learning in university of Ilorin.

## II. Methodology

The study adopted the descriptive approach of the survey type. The population for this study consisted of undergraduate students in the University of Ilorin. Random sampling technique was used to select a total of 100 students across all the 15 faculties and levels in the university. A researcher-designed questionnaire entitled "Individual and Technological Factors Affecting Mobile Learning" was used to collect for data this study. The reliability of the questionnaire used in this study was achieved by administering the questionnaire on students of Kwara State University, Ilorin. Cronbach Alpha was adopted to determine the reliability of the instrument. The items on the questionnaire had reliability co-efficient of 0.71. The individual and technological factors were examined using mean while relationship between the technological and individual factors was tested using Pearson Product Moment Correlation at 0.05 level of significance.

### a. Data Analysis Technique

The result of the administered researchers-designed questionnaire was subjected to descriptive statistics and correlation instrument and was coded and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0 for windows. The statistical tests used were descriptive analysis involving mean for research questions 1 and 2 and Pearson Product Moment Correlation Coefficient (PPMC) for the only hypothesis.

## III. Results

The following are the results of the analysis:

### a. Research question 1

What are the individual factors that affect undergraduates' use of mobile technology for learning in University of Ilorin?

Individual Factors	Mean
i can adapt ideas by using mobile technologies	4.44
i can develop ideas using mobile technologies	4.32
i can represent understanding in a multimodal way using mobile technology	3.64
i can access resources using mobile technology	4.40
i can exchange ideas with other students using mobile technology	4.70
mobile technology can be used to extend my participation in school	4.30

Table 1: Individual Factors that affect undergraduates' Perceived Usefulness of Mobile Technology for learning

Table 1 revealed that items which stated that students can adapt ideas by using mobile technologies had a mean of 4.44, developing ideas using mobile technologies had a mean of 4.32, exchanging of ideas with other students had the highest mean of 4.70 and representing understanding in a multimodal way using mobile technology has the lowest mean of 3.64. The implication is that students' individual factors positively affect their use of mobile technology for learning.

**b. Research question 2**

What are the technological factors that affect undergraduates' use of mobile technology for learning in University of Ilorin?

<b>Technological Factors</b>	<b>Mean</b>
Portability	4.52
information availability	4.62
psychological comfort	3.66
Satisfaction	4.08
Learnability	4.32
Comprehensibility	4.20
Intuitiveness	3.55
aesthetics of the interface	3.36
device networking	3.70
system connectivity	3.88
collaboration tools	3.50
internet access	4.10
document transfer protocol	3.82

Table 2: Technological Factors that affect Undergraduates' use of Mobile Technology for learning

Table 2 revealed the technological factors that affect undergraduates' use of mobile technology for learning. As indicated on table 2, the 13 items basically tested device usability. Analysis showed the resultant mean range from 3.36 to 4.62. This implies that the technological factors affected the use of mobile technology students learning positively.

**c. Research Hypothesis**

H<sub>01</sub>: There is no significant relationship between the individual and technological factors affecting undergraduates' use of mobile technology for learning in university of Ilorin.

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Variables	N	X	SD	r- value	Sig	Remark
Technological Factor	100	25.93	3.02			
Individual Factor	100	25.63	3.44	0.82	0.73	Accepted

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**significant at 0.05 alpha level**

Table 3: Relationship between the Individual and Technological Factors Affecting the Usefulness of Mobile Technology by Undergraduates

Table 3 shows the relationship between the technological factors and individual factors affecting undergraduates' use of mobile technology for learning. The data revealed a calculated r-value of 0.82, significant at 0.73. This level of significance is higher than 0.05 which was used for the decision, therefore the hypotheses is not rejected. There is a positive correlation between the technological factors and individual factors affecting undergraduates' use of mobile technology for learning  $r(100) = 0.72, p > .05$ . Hypothesis 1 is therefore accepted. This implies that there was no significant relationship between the technological factors and individual factors affecting undergraduates' use of mobile technology for learning.

**IV. Discussion of the Finding**

The study investigated the individual and technological factors affecting the perceived usefulness of mobile technology by undergraduates in university of Ilorin, Nigeria. The result of the study showed that individual and technological factors positively affected undergraduates' perceived usefulness of mobile technology. The result of the study is in consonance with the report of Oyinlola (2012) who reported that mobile devices were available for students learning and affects their learning positively. It also agrees with the report of Bamidele & Olayinka (2012). More so, the study revealed that there was a significant relationship between the individual factors and technological factors that affected the undergraduates' perceived usefulness of mobile technology. The outcome agrees with the report of Mudi (2013). Traxler (2007) also found that some people viewed mobile learning as mobility of learning in terms of learner's experiences of learning with mobile devices which support a wide variety of conceptions of teaching uniquely placed to support personalized, authentic and situated learning. Also, Ash (2013) reported that the proliferation of tablets, smartphones and other mobile devices has increased the number of games, apps, and software to help students learn thereby increasing their literacy skills.

## V. Conclusion

Based on the findings of the study, it could be concluded that individual and technological factors positively affected undergraduates' perceived usefulness of mobile technology. More so, the study concluded that there was a positive relationship between individual and technological factors that affected the perceived usefulness of mobile technology. The findings of this research also established that students perceived mobile technology to be useful and easy to use for learning. This implies that attention should be given to the use of mobile technology for learning among undergraduates with proper monitoring in order to gain the necessary skills and encouragement to make use of mobile technology and other ICT gadgets for learning.

## VI. Recommendations

Based on the conclusion of the study, it was recommended among others that students should be encouraged in the use of Mobile technology devices for learning since both individual and technological factors affected their perceived usefulness. Governments and institutions should also make available, facilities needed such as the internet in order to maximize the potentials of these technologies. This can be done either by reducing the price or making it free of charge; Universities, other tertiary institutions and secondary schools should also implement the distribution of tabs for students in order to make them acquire the required skills. University of Ilorin tablet computers and Opon -Imo (by the State of Osun for secondary school students) are existing examples; Curriculum planners and developers should include in the curriculum the use of mobile technology for teaching and learning in Nigeria.

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