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# SMARTPHONES USAGE AMONG UNDERGRADUATES OF UNIVERSITY OF IBADAN: AN IMPLICATION FOR ACADEMIC LEARNING

BY

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## Abstract

*There is a new revolution regarding the use of information communication technologies (ICTs) among undergraduate students in Nigeria with regard to smartphones application to academic learning. Colligan (2012), in a survey on smartphones users reported that some youths spend close to 6 hours or more on their phone in one day. Hence, to what extent could smartphones contribute to students' academic learning. This study used the qualitative and quantitative methods of research with the questionnaire and focus group discussion guides as instruments to gather relevant information for the study. Five hundred (500) male and female undergraduate students from various departments in the University of Ibadan who are smartphones users were selected for the survey questionnaire while Focus Group Discussion sessions were held with selected students on their perception of smartphones usage as a learning device among students in the university community. Findings reveal that majority of the students reported frequent use of applications such as Dictionary (91%), Facebook (88.6%), 2go (88%), Twitter (82%), YouTube (78.8%), Whatsapp (60.4) and LinkedIn (54.6%) on their smartphones device. Findings also show that an appreciable proportion of the respondents (22.2%) spend 1 hour a day on reading/downloading academic applications like PDF articles/journals on smartphones. Students reported the usage of smartphones for academic purpose with 91% stating that the use of smartphones has reduced their dependency on computer-based learning and 83% use their smartphones to look up words in the dictionary application. Further findings from the t-test reveal a significant influence of gender on smartphones use among students ( $p < 0.01$ ). Though the female students were reported as using more smartphones than their male counterpart ( $t(498) = -9.62, p < .01$ ), more male students use academic-oriented applications on their smartphones than their female counterpart whose use are more for socializing. This study has established that the smartphone is a useful device that can enhance academic learning among undergraduate students hence it should be encouraged in order to promote new dimension of information communication technologies (ICTs) in the emerging generation of educational development in developing countries.*

**Key word:** Smartphones, academic learning, undergraduates, University of Ibadan, Nigeria

## Introduction

Global Mobile System of Communication popularly called GSM has led to an astronomical rise in ownership and use of mobile phones all over the world, Nigeria inclusive (Aboderin 2012). Feature phones were the early forms of mobile phones used all over the world and this type of phones lasted in the global market for quite a period of time before the introduction of smartphones. Although devices combining telephony and computing devices were conceptualized as early as 1973 and were offered for sale beginning in 1994, the term 'smartphone' did not appear until 1997, when Ericson described its GS 88 "Penelope" concept as a "Smartphone". The earliest smartphones combined the

functions of a personal digital assistant (PDA) with a mobile phone. Later models added the functionality of portable media players, low-ended compact digital cameras, pocket video cameras, and GPS navigation units to form the multi-use device. The introduction and subsequent unveiling of other smartphone brands have brought together industry leading smartphones software and services to provide web, instant messenger and multimedia powerful and easy to use e-mail, calendar applications as well as access to social networking sites such as Facebook, Twitter, MySpace and other mobile business and lifestyle applications. Students of tertiary institutions now find it appealing to possess smartphones because of its sophisticated nature. More than one out of ten students in Nigeria now own a smartphone (Aboderin, 2012).

However, studies have revealed that the smartphone is fast gaining reputation as symbol of power and affluence; it has penetrated almost every facet of today's society. In fact it is fast becoming an integral part of people's everyday lives (Robertson & Hagevik, 2008:6). Some students now believe that the heavier and expensive one's smartphone looks, the more distinguished one's personality is, especially when one is in the habit of fiddling with it in public. The latest kind of smartphones which are the android and Blackberry phones have presently been perceived as a must-have accessory to all socially inclined students, and this percentage tends to revolve round the generality of the students in developing countries like Nigeria. Many undergraduates in Nigerian Universities are now hypnotized by this magical device as it has become an essential part of modern day life.

According to El-Hussein (2010), Smartphones emerged as hybrids of PDAs (Personal Digital Assistants) and mobile phones in the 1990s, bringing together connectivity and diverse collection of hardware and software-based functionality. Smartphones have developed considerably since then, becoming increasingly commonplace following the release of Apple's iPhone in 2007. The mobile operating systems found on Smartphones allow users to run software, commonly known as 'apps', which deliver highly usable and tightly focused functionality enabling myriads of applications. In some cases, applications are pre-installed on smartphones, though many others are freely and cheaply available. The device therefore become highly customized personalized platforms for communication, organization, information production and content management.

While smartphones are only pocket-size, they incorporate computing power and memory capable of running complex software and storing huge amount of data. Functionality include full 'qwerty' keyboards, cameras, audio recorders, gesture-based input, and high resolution displays, complemented by a wide range of apps which include support for office productivity, location-based interactivity, media production, web browsing, social media, communication and entertainment (Meddleton, Nortcliffe and Woodcock, 2012)

On the features of smartphones, Lanae (2011) described how the device can conveniently and directly connect to the internet through protocols including wifi and 3G and indirectly through Bluetooth. This connectivity allows data to be accessed from anywhere in a timely way, whilst it also allows the user to distribute content in various media to others. A smartphone, therefore, offers a rich set of mobile computing functions with connectivity; this combination frees the user from desk-based ICT associated with traditional computing in education. Smartphones are ubiquitous and accessible device that travel with the user, so empowering them to respond to situations, ideas and needs as they emerge. The capacity of a smartphone access manipulate, produce, store and share content almost as soon as it is created, wherever it is created, provide the rationale for why education needs to explore technology (Meddleton et. al. 2012).

People worldwide have become increasingly enthusiastic in embracing mobile digital communications equipment; from a laptop connected to the internet via wireless fidelity (Wi-Fi) to personal digital assistants to mobile phones, more and more people are connected to each other from remote distances. With the proliferation of mobile phone technologies, communications scholars have

begun to question how these technologies are being, and might be assimilated into people's lives, especially students (Katz & Aakhus, 2008).

The device is being described in literature (Aboderin, 2012; Colligan, 2012; Lee, 2011; Robertson & Hagevik, 2008) as a powerful multi-function device that offers a rich set of mobile computing functions with connectivity which frees the user from desk-based ICT associated with traditional computing in education. On the smartphone being an amazing piece of technology, Lane (2012) observed that smartphones allow access to telephone service, maps, organizers, applications and internet services thereby giving students the access to explore the device. The Smartphone is described as a device that can be of great benefit to students and studies have shown that the way students integrate certain ICT devices into their lives determines what effect it will have on their academic life. Hence, the main objective of the study was to explore how undergraduate students are currently using their smartphones for academic learning, the extent to which the smartphone, as an ICT device is being maximized for academic programmes and the percentage of users who are using their devices for academic learning.

### Research Questions

The study was guided by the following research questions:

1. What are the frequently used smartphone applications by students?
2. What percentage of smartphone users utilizes their device for academic purposes?
3. Is there a significant difference by gender, in the use of smartphones?
4. What are students' perceptions of using the mobile phone for learning?
5. To what extent does smartphone use influence the learning of undergraduate students in the University of Ibadan?

### Literature Review

Technological advancement across the world and over the ages has affected the development of education. There was no great importance attached to the ability of the individual to be able to use ICT devices in the past but with time, things changed and people all over the world: business men, and educators including students became conscious of the importance of keeping abreast of trends as computing devices continued to take over the roles of the newspaper every day. Katz & Aakhus (2002) provided a compilation of studies from ten cultures to understand how mobile technologies are shaping human life across cultures. Walsh (2012) reviewed the study of Katz (2008) on mobile communication to understand the learning consequences of mobile technology across the world. Findings showed that a higher percentage of students are using their mobile devices for learning. Corbeil et al (2007) refer to mobile learning as a subset of e-learning that focuses on learning across contexts and learning with mobile devices. It is any sort of learning that happens when a learner is not at a fixed, predetermined location; a learning that takes advantage of the learning opportunities offered by mobile technologies. One great advantage of this type of learning is that learners can learn anywhere and at anytime. For students, this is a very powerful device and using it for learning purposes could be of great benefit to them as they can learn at their own time utilizing internet services and other pedagogical offline applications.

Studies have shown that academic performances can improve if educators employ productive ways to integrate mobile learning devices into the curriculum (Wylie, 2011). Nielsen (2010) in her book titled *The Innovative Educator* noted that with the invention of smartphones, many computer-based activities have been made easier and more accessible. Mobile devices have been used both informally by users who seek out their own learning experiences, and formally by users who are

prompted to do so as part of a class. Both formal and informal uses, however, occur in classrooms across the world.

It has been established by some findings among university students that smartphones use can either affect learning negatively or positively. However, a very crucial factor to put into consideration is the manner in which the device is used. Other scholars looking at different ICTs (specifically in relation to the internet) have suggested that the heavy use of technology for recreational purposes is highly correlated with reduced academic performance (Kubey, 2001). Hence, the study is concerned with assessing the relationship between smartphones use and learning.

Students in places such as China, Japan, the Philippines and Germany, use their cell phones to study not only English, but also Mathematics, Health and Spelling (Robertson & Hagevik, 2008:3). Robertson and Hagevik (2008) also report that many places of historical significance are making use of cell phones to provide guided tours of their museums and parks. As experimental uses of the cell phone are quickly becoming a reality, one can see more innovative ways of its integration into the education curriculum. Many of the research projects reviewed demonstrate the need for a revitalization of the delivery methods traditionally used by instructors and teachers. It is through the use of the cell phones in various educational settings and the continuous evolution of distance learning or D-learning to E-learning, supported through information and communications technology that has prompted the move toward mobile learning. Mobile learning combines two areas of learning; mobile computing and E-learning. This is considered to be the future of learning or an integral part of any other form of the educational process (Corbeil & Valdes-Corbeil, 2007, Trifonova, 2003). M-learning must include the capacity of the learner to be able to learn anywhere anytime without constraints of cables or physical networks (Corbeil & Valdes-Corbeil, 2007; Georgiev, Georgieva, & Smrikarov, 2004). The student is able to work on assignments and course-work in places such as riding the bus home from school, waiting for a train or between classes which, otherwise, would potentially be wasted time.

Librero, Ramos, Ranga, Trinona and Lambert (2007:232) in Walsh (2012) state that mobile learning for educational uses can offer many advantages as a chosen method for delivery of lessons and outcomes. Some of these include: empowering and engaging the learner by making him or her more comfortable for private and personal topics; is best used as part of a blended learning module; is not a single solution but one of the tools teachers have in their tool box; is a two-way communications tool that provides for collaboration and creation; it can lead to more sophisticated uses of information and communications technology (ICT) and associated skills and it allows for both the teacher and the student to learn together.

In Thailand, at the University of Philippines Open University (UPOU), the cell phone is being put to the test, literally. Results of students, who can access quizzes and tests via their cell phone, have proven it to be effective with little difference between grades of those who completed the same tests using conventional methods (Librero, Ramos, Ranga, Trinona & Lambert, 2007). Along with formal learning and formal testing, cell phones use - according to studies in the line of Libero et al (2007) - is proving to be a valuable tool for the informal learning situation. Santos and Ali (2012:191) discuss the use of cell phone by medical students who used mobile phones to access needed information and were able to review the content and the notes, while on training. While it is becoming more common for many of today's students to use cell phones for tasks such as texting and Internet access, some of them are exploring ways to use them in many other situations.

In Europe for instance, some students perform tasks such as downloading audio and video lectures and podcasts, editing text documents, accessing e-mail and web contents as well as using their phones for mass storage (Corbeil & Valdes-Corbeil, 2007). While it seems students' recording of their own voice and video are not so popular, they do invite opportunities to access information, read e-books, listen to audio files, and use their phone's administrative tools such as calendars and contact

lists, which support their informal learning (Santos & Ali, 2012). When asked how often they use their phones to support informal learning activities, students reported they interact with their classmates on an average of 73% of their phones usage time and use administrative tools such as calendar application on an average of 73% (Santos & Ali, 2012, :195). The topics of discussion during these informal sessions included such things as course assignments, projects, questions, information and clarification of issues which demonstrates the informal learning and its impact on the students' formal learning as well.

In Nigeria, more than half of university students are early adopters of smartphones according to the National survey but few take full advantage of many of the advanced features these phones have to offer. Tankely (2011) cited in Wylie (2011) explained that the cell phone provides potential to empower and uplift students in their learning. She says "to maximize effectiveness, education in the 21s century has to be active, engaging and customized." Students must have the universal access to mobile technologies that will enable critical thinking, differentiation, and problem solving. It is believed that the technology in many smartphones meets these needs and more. Smartphones and other Wireless Mobile Devices (WMDs) are all part of the ever-growing world of wireless connectivity with the smartphones quickly becoming the main tool in the always-connected society of today (Cockrane & Bateman, 2010). Wood (2012) reported that in general, there is a consensus that existing and emerging digital technologies have the potential to expand the reach of current educational tools. In Nigeria university students no doubt communicate easily as a result of the rapid growth of popular online communication media. With the widespread of internet services provided by telecommunication companies in Nigeria, and the increased use of the internet via computers and especially the smartphones, tablet and other handheld devices, young people now have unbridled access to the web and social media (Uduma, 2013).

### Methodology

This study examined the students' perception of using the smartphone for academic learning and the percentage that use it for this purpose. This study used mixed-methods approach using qualitative and quantitative methods. Hence, the survey questionnaire was used as an instrument for the quantitative approach while Focus Group Discussion was employed as the qualitative approach to gather relevant information for the study. The choice of questionnaire survey was informed by the fact that the study examined common applications frequently used by students, estimated time spent on them and the ones they give priority in which respondents would have to report on specific point scales. Similarly, FGD was the most appropriate approach to answering questions investigating students' personal views about using the smartphone for learning.

Male and female Undergraduate students from various departments in the University of Ibadan who are smartphone users completed a questionnaire on their smartphone usage. An FGD (Focus Group Discussion) was also conducted in order to examine students' perception of using the smartphone as an educational tool, its use in the classroom and possible influence on academic learning. The sample size comprised 500 respondents purposively selected as smartphone users from the different Departments in University of Ibadan to complete the questionnaire. Five hundred (500) copies of the questionnaire retrieved from respondents were those dully completed. Two Focus Group Discussion sessions which comprised eight (8) and seven (7) participants respectively were conducted to collect data on students' perception of using the smartphone for academic purpose.

The Purposive Sampling technique under the non-probability sampling method was used to select respondents for both questionnaire survey and Focus Group Discussion, based on their status as smartphone users and undergraduate students of the University of Ibadan with active internet

subscription over a period of time. The questionnaire items contained two sections: the first part gathered demographic information about the respondents' gender, age, marital status and current level of study. The second part investigated what students frequently use their smartphone for, the duration of time they spend on it and the applications they frequently use.

The Focus Group Discussion (interactive session) guide contained seven questions used to elicit information about students opinions, perceptions and attitudes towards smartphones use especially for academic learning. Questionnaire copies were administered to the respondents in their various departments on campus and hall of residence. These copies were also retrieved immediately after they had been completed. Two sessions of Focus Group Discussion, consisting of at least 8 and 7 students respectively took place in two halls of residence on University of Ibadan Campus. Data obtained were analyzed using the simple frequency percentage for the survey questionnaire while information for the FGD were recorded, coded and issues of interest were sorted for analysis. In addition, a free atmosphere was given to respondents to self-report required information. FGD participants were also given the opportunity to give sincere and honest response to the questions asked. All issues in the questions and information gathered from them were treated with utmost confidentiality.

### Findings and Discussion

Findings reveal that majority of the students reported frequent use of applications such as Dictionary (91%), Facebook (88.6%), 2go (88%), Twitter (82%), YouTube (78.8%), Whatsapp (60.4) and LinkedIn (54.6%) on their smartphone device. Apparently, one pre-installed application that often comes with the smartphone is Offline Dictionary. It is a common pre-installed application that many smartphone users have access to for formal and informal learning of English words. It is however not surprising that the learning application is common among students and they are quick to identify it as a learning application. Findings also show that an appreciable proportion of the respondents spend an 1 hour a day on academic application such as navigating to google scholar (85.6%) reading/downloading PDF (69.4%) and reading articles/journals (86%) on their smartphones. The following tables shows the frequency of smartphone applications use:

**Table 1: Frequency of Smartphone Applications Use**

Smartphones Application	Frequently	Seldom
YouTube	397(78.8%)	103(21.2%)
Twitter	414(82.8%)	86(17.2%)
Games	354(70.8%)	146(29.2%)
WhatsApp	302(60.4%)	198(39.6%)
2go	402(88.4%)	98(7.6%)
Facebook	443(88.6%)	57(11.4%)
LinkedIn	273(54.6%)	227(45.4%)
Dictionary	445(91%)	45(9%)

Table 2 shows the estimate of time spent on smartphone applications.

**Table 2: Estimate of Time Spent on Smartphone applications**

Smartphones Application	1hr daily	1-3 hrs daily	Total
Facebook updates	109 (22.2%)	391 (78.8)	500(100%)
Twitter updates	222(44.4%)	278(55.6%)	500(100%)
Listening to music	352(70.4%)	148(29.6%)	500(100%)

Watching videos	335(71%)	145(29%)	500(100%)
Instant messaging	115(23%)	385(77%)	500(100%)
Making calls	383(70.4%)	148(29.6%)	500(100%)
Navigating Google scholar	428(85.6%)	72(14.4%)	500(100%)
Reading news update	407(81.4%)	93(18.6%)	500(100%)
Reading/downloading PDF	346(69.4%)	154(30.8%)	500(100%)
Reading articles/journals	430(86%)	70(14%)	500(100%)

This shows that though students spend time on social media application, they also spend appreciable time sourcing for academic information. This finding is in consonance with the findings of Adegbenro (2011) who established that students spend long hours on their mobile phones. He further stated that this can be described as a sign of heavy dependence on the mobile media.

The findings further reveal that a high proportion of the students reported the usage of smartphone for academic purpose with 91%, stating that "having a smartphone reduces their dependency on computer-based learning" while 83% said "they use their smartphones to look up words in the dictionary". Santos & Ali (2012) reported that students spend 73% of their smartphone usage on tasks which included such things as course assignments, projects, questions, information and clarification of issues which demonstrates the informal learning which impact on the students' formal learning as well.

Further findings from the t-test in the table below reveal that the influence of gender on smartphone use is significant ( $p < 0.01$ ). This shows that gender significantly influences the use of smartphone among students. Female students reported more smartphones use than their male counterpart ( $t(498) = -9.62, p < 0.01$ ). This implies that there is gender difference in the use of smartphones among the students sampled.

**Table 3: T-test Summary Table Showing the Influence of Gender on Smartphone Use**

Smartphones use	Gender	N	Mean	Std	df	T	P. Value
	Male	321	35.79	7.84	498	-9.620	<0.01
	Female	179	44.02	11.15			

Nevertheless, more male students reported frequent use of academic applications like linkedIn ( $X^2 = 1.15, df = 1, p > .05$ ), spread sheet ( $X^2 = 2.72, df = 1, p > .05$ ), Dictionary ( $X^2 = 2.77, df = 1, p > .05$ ), Adobe reader ( $X^2 = 1.87, df = 1, p > .05$ ), MS word scholar ( $X^2 = .01, df = 1, p > .05$ ) and Google scholar ( $X^2 = 1.26, df = 1, p > .05$ ) compared to the their female counterpart. This shows that more male students use academic-oriented applications than their female counterpart whose use are more for socializing. This finding is in line with Chen's (2010) study which reported female participants having significantly higher addiction to exchanging instant messages on their smartphone than males. Findings also agree with the position of Aoki & Downes (2013); Colligan (2012) and Warner (2003) who reported that female college students spend a lot of time on gaming and entertainment applications, ignoring other applications that can assist learning.

This finding was further corroborated during one of the focus group discussion sessions held with other selected students at the university in which majority of the students observed that students use their smart phones for academic activities than for social activities while some of them still

observed that their colleagues use their smartphones for both academic and social activities at an equal proportion. A respondent at one of the FGD sessions who believed that some students actually use their smartphones for academic purpose said: "in my opinion, I have observed in class that some students don't use their smartphones for social interaction alone, they also use their smartphones to check the meaning of difficult words in the dictionary".

A trend which was noticed in the questionnaire survey was that students are more familiar with the dictionary as the learning application on smartphones. Majority of the students who were of the opinion that some students use their smartphones mainly for learning are quick to mention the dictionary as an application that they frequently use. Students use their smartphones for recording lectures and storing lecture notes for later use in their studies. They also suggest that the use of smartphones in the classroom for academic purposes should be encouraged. Some students, however, believed that the smartphones can actually encourage academic activities. This they say will be determined by the use to which the students put their smartphones.

The opinions of students suggest that if the use of smartphones is carefully handled and both the students and the lecturers agree on its use in the classroom, it will immensely make learning easier for both parties involved in the academic endeavours. In their opinion, it will be most useful especially in the recording of lectures. The students believe that this will particularly make a lot of difference where students are finding it difficult to take notes from certain lecturers whom they consider too fast. The recorded lectures can then be played back at the student's free time for a better understanding of the lectures given in the class. Another respondent expatiated on the issue as follows: "I personally think that the ability of the smartphone to record is very useful and many students should find this very useful to them too. Sometimes lecturers are too fast. At other times they don't speak up and you can't always ask the lecturer to repeat himself. This feature can help students learn better at their pace".

To majority of the participants in the FGD sessions, the greatest beneficiary of this will be the students while the lecturers will have to make fewer pauses during lectures as a result of the students calling for a repetition of statements from time to time. It can be deduced from the responses presented above that many students are aware of the learning capability of their smartphone devices but are yet to fully put them to use for academic purposes. This finding supports the questionnaire data on the use of smartphone which many students reported that they use more frequently for academic purpose. It was also observed during the FGD sessions that the male students demonstrated understanding of capability of the smartphone devices for academic use as they conveniently mentioned applications such as Adobe downloading, Journal updates and Word processing, unlike their female counterpart who mostly mentioned the dictionary. This finding buttresses the findings of Santos & Ali (2012) which reported that students spend 73% of their smartphone usage on tasks which included such things as course assignments, projects, questions, information and clarification of issues, which demonstrate the informal learning which impact on the students' formal learning as well.

Researchers such as Corbeil and Valdes-Corbeil (2007) reported that while it is becoming more common for many European students to use cell phones for tasks such as texting and Internet access, some of them are exploring ways to use them in many other situations as currently being developed among students in developing countries like Nigeria. Many students perform tasks such as downloading audio and video lectures and podcasts, editing text documents, accessing web content as well as using their phone for mass storage. Furthermore, findings support the Dependency theory of Ball-Rockeach and DefleurMedia (1976) which states that individuals do not depend on all media equally; they choose the preferred ones over others irrespective of their usefulness. Uses and Gratification theory also states that users use certain media and there are gratifications they expect to derive from such media. Obviously, majority of the students get some kind of reward or satisfaction from the use of smartphone application they choose to use; thus these applications are given priority over others.

### Conclusion/Recommendation

This finding revealed academic revolution among students in the 21<sup>st</sup> century in Nigeria where the country is still facing a lot of challenges of social, political, economic and educational development. This has established that the smartphone is deemed fit to be a good learning tool among undergraduate students within the university system. Students find the use of smartphones for academic purposes such as in-class e-learning, self-learning, studying, word processing etc. The study further shows that the use of smartphones can only improve if lecturers employ productive ways to integrate mobile learning devices into their teaching. It is recommended that the use of smartphones be integrated into e-learning strategies within the university teaching and learning methods for students.

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