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ACCEPTANCE OF SMARTPHONE TECHNOLOGY AS MOBILE LEARNING TOOL AMONG COLLEGES OF EDUCATION STUDENTS IN NIGERIA

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Abstract
This study investigates "Acceptance of Smartphone Technology as Mobile Learning Tool among Colleges of education Students in Nigeria". Descriptive survey research design was used for the study. A sample size of 376 was selected from the population using simple random sampling techniques. The instrument used for data collection was questionnaires which consist of twenty questions. It was validated by three experts; pilot tested at college of education Azare and subjected to reliability test using split half method. A reliability coefficient of 0.75 was obtained using Cronbach Alpha. Data collected was analyzed using statistical package for social sciences (SPSS). Mean and standard deviation were used to answer the research questions accordingly. The findings revels that, College students utilized their smartphones as mobile learning tool. They mostly do assignments, search relevant educational materials, send and receive educational mails from teachers and experts using their smartphones. Similarly, college students also find it very simple and easier to operate smartphone as mobile learning tool. It was recommended that government should provide reliable and affordable internet connection in the school premises and also control the price of data from private telecommunication companies. Schools should block all pornographic sites to prevent students from accessing these sites. Teachers should be train and encourage to put-in-place what they have learned on the use of smartphone in teaching and learning process.
Keywords: Smartphone Technology, Mobile Learning Tool, Colleges of Education Students.

Introduction

Technology penetration in to our daily activities cannot be estimated; with a consideration to daily purchase of smartphone across the globe. Smartphone ownership among youth becomes fashion of the day, not even owning a smartphone matters, but the type and nature of the phone. This distinction exists regardless of gender among the users. Gikas and Grant, (2013) states that, 57% of U.S.A university students use Smartphones and there are 1.5 million iPads used in education. Estimates also suggest that more than half of the population in the UK, Norway and Sweden own Smartphones (Alfawareh & Jusoh, 2014). In 2010, 80 million Smartphones have been purchased, including 20 million Android devices and 14.1 million iOS phones (White & Turner, 2011). Similarly, Data reporters (2020), stated that, there were 169.2 million mobile connections in Nigeria in January 2020 which is equivalent to 83% of the total population. The number of mobile connections in Nigeria increased by 12 million (+7.7%) between January 2019 and January 2020.

Dea, (2020), forecasted the number of smartphone users in Nigeria to grow up to more than 140 million by 2025. Currently, estimates from different sources put the number of smartphone users in Nigeria at roughly 40 million. The operation system found in smartphone opens application's and is able to connect users to the Internet whenever need arises. Smartphones are generally equipped with a range of advanced computing features and can synchronize data with a personal computer. Smartphone computing platforms are gradually being used for instruction because such devices are becoming common as the primary computing devices used by people, and because they can excite students about computing and networking. Smartphones are primary leaders of accessing m-learning content when compared to other mobile devices like, tablet, Pocket PC, Personal Diary Assistant (PDA), Laptops,

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netbooks (Godwin-Jones, 2011). The major advantages of smartphone over other devices include but not restricted to: Majority of learners have Smartphones (Hsu, Rice, & Dawley, 2012), most Smartphones are cheaper than desktop, tablets, and laptop computers, size and weight of Smartphones aid anytime-anywhere learning, less data consumption when compared with laptops, tablets and desktops, easier operation, long life battery capacity of smartphone when compared with other devices.

Smartphone gives the opportunity to its user to use it both inside and outside of the institution for learning and it can provide a continuous learning environment if the learners are connected to their smartphone through internet. That is how smartphone has the potentialities to be used as mobile learning tool (Seralidou & Douligeris, 2016). Currently, there are over 500,000 educational applications (Google classroom, edX, Khan Academy, Duolingo, Remind, Photomath, SoloLearn, Quizlet, Kahoot, Udemy, remote work and ulesson) present in applications stores ready for exploitation for mobile device users (EducationalAppStore, 2020). Mobile learning has a potential to offer techniques such as personalized learning, contextual learning situated learning, collaborative learning, ubiquitous learning, lifelong learning, just-in-time learning, micro learning, rich media learning, immersive learning, synchronous learning and asynchronous learning (Franklin, 2011). Mobile learning is not simply a different method for delivering content to learners but it is rather a modern way of incorporation technology in to educational methods of content delivery. It tries to improve classroom delivery to learning anytime and anywhere (learning without boundary). This new system entails a paradigm shift where a rethinking is required of current educational strategies with the addition of mobile technology (Berking et al., 2012). As students keep Smartphone with them, they have the humble opportunities to assess internet, browse and download any academic documents related to their course at any time and in anyplace (Mazharuddin & Akramul, 2018).

Smartphone higher penetration can ensure that most learners engage in mobile learning based on technological push pedagogy (Smarkola,

2011). As Smartphones are already popular among young people at homes, social places and academic environment, the challenge now is how students accept the technology and make the optimal use of it to support their learning (Nassuora, 2012). A research indicates that, the major causes of accepting or rejecting technology among people are varied perceptions regarding the usefulness and perceived ease of use of the technology (Taherdoost, 2017). Perceived usefulness is defined as the degree at which an individual believes that using a specific technology would improve his or her job performance while perceived ease of us, refers to the degree to which a person believes that using a specific technology would be free of much effort do to the simplicity of technological operations. The theoretical potion of the above variables was highlighted in the Technology Acceptance Model (TAM 2) proposed by Venkatesh & Davis (2000).

Technology Acceptance Model (TAM)
The domain of technology acceptance model has always tried to accurately explain the user acceptance of information technology. The Technology Acceptance Model (TAM) was proposed by Davis, Bagozzi and Warshaw (1989) and it deals specifically with the prediction of the acceptability of an information system. The purpose of this model is to predict the acceptability of a tool and to identify the modifications which must be brought to the system in order to make it acceptable to users. This theory was widely accepted as the fundamental step in explaining human behavior in accepting technology. It explained the process with two beliefs: perceived usefulness and perceived ease of use.

Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" (Gradmann et al, 2011). Perceived ease of use is defined as "the degree to which a person believes that using a particular system would be free of effort" (Davis et al., 1989). Technology Acceptance Model postulates that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the person's attitude towards the use of the

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system and also by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact which it may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work. Besides, the Technology Acceptance Model hypothesizes a direct link between perceived usefulness and perceived ease of use. With two systems offering the same features, a user will find more useful the one that he finds easier to use (Dillon and Morris, 1996).

According to Davis (1986) perceived ease of use also influences the attitude of an individual in two significant ways: self-efficacy and instrumentality. Self-efficacy is a concept developed by Bandura in 1982 which explains that the more a system is easy to use, the greater should be the user's sense of efficacy. Moreover, a tool that is easy to use will make the user feel that he has a control over what he is doing. Efficacy is one of the main factors underlying intrinsic motivation and it is what illustrates here the direct link between perceived ease of use and attitude (Bandura, 1982). Perceived ease of use can also contribute in an instrumental way in improving a person's performance. The user will have to deploy less effort with a tool that is easy to use (Davis, 1986).

Although the initial TAM model was empirically validated, it explained only a fraction of the variance of the outcome variable from 4% to 45% (McFarland and Hamilton, 2006). Therefore, many authors have refined the initial model, trying to find the latent factors underlying perceived ease of use and perceived usefulness in TAM2 of Venkatesh (2000).

Extended Technology Acceptance Model (TAM2)

TAM2 was developed in information technology field. It had been extended from TAM by Venkatesh and Davis (2000) in order to explain perceived usefulness and perceived ease of use from the social influence and cognitive instrumental processes view-points. Social influence processes refer to: subjective norm, voluntariness, and image, while cognitive instrumental processes refer to: job relevance, output quality, result demonstrability, and perceived ease of use. Unlike TAM, Venkatesh and Davis inserted subjective norm as an additional construct by adopting from TRA and TPB models. Subjective norm has direct relations with perceived usefulness and intention of use. Its relation with perceived usefulness is moderated by the user experience, while its relation with intention of use is moderated by the user experience and voluntariness of use. Extending TAM to TAM 2 by including some constructs from older theories in addition to some moderators to perceived usefulness and perceived ease of use will enhance the performance to the model. As an example, the existence of experience moderator will show the increase in the level of users' experience in technology over the time, and this will cause a tangible change in technology acceptance to them (Alan et al, 2017).

Purpose of the Study

The main purpose of this study is to investigate the acceptance of smartphone technology as a mobile learning tool among colleges of education students in Nigeria specifically with the following objectives; To investigate the level of utilization of Smartphone as a mobile learning tool among colleges of education students in Nigeria and to find out the level of simplicity of smartphone operation as a mobile learning tool among colleges of education students in Nigeria.

Research Questions

1. What are the levels of utilization of Smartphone as a mobile learning tool among colleges of education students in Nigeria?
2. What are the levels of simplicity of smartphone operation as a mobile learning tool among colleges of education students in Nigeria?

Research Methodology

The design adapted for the study was descriptive survey research design and the research type is quantitative method. The study covers the whole Federal Colleges of Education (Technical) in northeast. These are Federal College of Education (Technical) Potiskum, Yobe State and Federal College of

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Education (Technical) Gombe, Gombe State. They were tagged as college A and college B respectively; and both colleges have a total population of 15,103 students as presented in the table below.

Table 1: Federal Colleges of Education (Technical) in Northern Nigeria

S/No	Institutions	No of Students
1.	College A	8,725
2.	College B	6,378
	Total	**15,103**

Source: Academic office of the respective colleges of education (2018/2019)

Stratified sampling techniques was used in selecting the sample college and college A was selected. From college A, faculty of science education was randomly selected to participate in the study and a sample of 4,107 students was gained from the sample area. A sample size of 376 was obtained using Krejcie and Morgan table for determining sample size. A questionnaire titled smartphone acceptance questionnaire (SMAQ) was used for data collection, which contains twenty questions. It was validated, pilot tested and subjected to reliability test using split half method. A reliability coefficient of 0.75 was obtained using Cronbach Alpha. Questionnaire was administered and collected back from the respondents after responding accordingly. Mean and standard deviation was used to answer the research questions accordingly.

Result

Table 2: Mean and Standard Deviation of perceived usefulness of Smartphones as Mobile Learning Tool among Colleges of Education Students

S/N	Items	Mean	SD	Decision
1.	College students use their smartphone to do assignment.	3.38	0.86	Agree
2.	College students search relevant educational information through their smartphones.	2.57	1.22	Agree
3.	College students read and download e-books using their smartphone.	2.10	0.97	Disagree
4.	College students visit social media through smartphones to get hints about their courses.	2.40	0.97	Disagree
5.	College students watch online academic activities and download relevant educational videos through their smartphone.	2.74	1.08	Agree
6.	College students send educational SMS and e-mail through smartphones daily.	2.97	0.98	Agree
7.	College students utilize social media sites using smartphones for educational purposes.	2.69	1.09	Agree
8.	College students download and utilize educational applications through their smartphone.	3.09	0.90	Agree
9.	College students get educational assistance from experts through their smartphones.	2.77	1.00	Agree
10.	College students make effective and efficient utilization of their smartphones for educational purposes.	2.06	1.05	Disagree
	Cumulative Mean	**2.68**		

Decision Mean = 2.50　　　　Source: Field Survey (2019)

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Table 2 presented the mean and standard deviation of perceived usefulness of smartphone as mobile learning tool among colleges of education students. The result reveals a cumulative mean of 2.68 which is greater than the decision means of 2.50. This is a strong indication of smartphone utilization as mobile learning tool among college students.

Table 3: Mean and Standard Deviation of Simplicity of Smartphone Operation as Mobile Learning Tool among College Students

S/N	Items	Mean	SD	Decision
1	It is easy for me to remember how to perform tasks using my smartphone.	3.00	0.96	Agree
2	Language used by Smartphones manufacturers is direct and simple to understand	3.13	0.90	Agree
3	I find it easy to manipulate my smartphone and do what I want to do with it.	2.95	1.05	Agree
4	Icons in menu display used in Smartphones are simple and easier to navigate	3.32	0.99	Agree
5	Smartphone is very complex phone in terms of operation.	2.06	0.88	Disagree
6	I find the overall smartphone system very easy to use.	2.55	1.17	Agree
7	Must of the educational applications used on smartphones are available and are simple to operate.	2.99	1.01	Agree
8	I often become confused when I use the smartphone for my learning.	2.02	1.05	Disagree
9	I make errors frequently when using smartphone	2.06	0.99	Disagree
10	Downloading and installing educational applications on smartphone is simple and easier.	3.03	1.02	Agree
	Cumulative Mean	**2.71**		

Decision Mean = 2.50 Source: Field Survey (2019)

Table 2 presented the mean and standard deviation of perceived ease of use of smartphone as mobile learning tool among colleges of education students. The table also reveals a cumulative mean of 2.71 which is also above or greater than the decision means of 2.50. The result is an indication of smartphone ease of usage of mobile learning tool among college students.

Discussion of Findings

The study reveals that, college students utilized their smartphones for learning purposes due to the fact that the cumulative mean of 2.68 is greater than the decision mean of 2.50. They mostly do assignments, search relevant educational materials and send and receive educational mails from teachers and experts using their smartphones. This finding is in line with that of Chen and Denoyelles (2013) who mention that, among the students who had access to smartphone devices, more than half (82% percent) use it for academic purposes. It is also in line with the finding of Seifert (2014), who found that, college students, use their smartphones for surfing the Internet, as a GPS locator, manage their learning, visit social site, record lessons, set lectures alarm, snap pictures and write notes. It also agrees with the finding of Tosta (2014) who found that, students read and downloads e-books and lectures slides through their smartphone. It also agrees with the finding of Ezemenaka (2013) who reveals that, students browse more with their smartphone searching for academic information.

The finding of the study also reveals that, students find it easier and simple to operate smartphone for learning activities due to the fact that, the cumulative mean of 2.71 is greater than the decision mean of 2.50. This indicates that majority of college students are not facing problems when operating their smartphone as a tool to facilitate their learning do to its simplicity in operation. A research was also conducted on smartphone perceived ease of use and the result indicated

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that, there is high degree of smartphone ease of usage among students (Xun et al 2016). Another study carried out by Chiou (2015) revealed that, most of the students agreed that learning via their own mobile device was easy and convenient and over 80% of them expressed their satisfaction on the use of mobile phone for learning. They further believed that, smartphone improved their performance and enabled them to accomplish learning more quickly.

Conclusion

In conclusion, the findings justify and support the Technology Acceptance Model (TAM) in assessing the acceptance of smart phones through measuring their usefulness and ease of their usage among college students. The study also indicated the degree of smartphone acceptance as mobile learning tool among college students. College students utilized their smartphones for learning purposes. They mostly do assignments, search relevant educational materials and send and receive educational mails from teachers and experts using their smartphones. College students also find it very simple and easier to operate smartphone for learning activities. This indicates that majority of college students are not facing problems when operating their smartphone as a tool to facilitate their learning do to its simplicity in operation.

Recommendation

The following recommendations were drawn based on the research findings

1. Government should provide reliable and affordable internet connection in the school premises to encourage students' autonomous learning.

2. Teachers should be train by government officials and encourage to put-in-place what they have learned on the use of smartphone in teaching and learning process.

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