AVAILABILITY, READINESS AND UTILIZATION OF SMAARTPHONES FOR LEARNING AMONG BIOLOGY STUDENTS IN COLLEGES OF EDUCATION GOMBE STATE, NIGERIA.

By

Dr I. I Kuta
School of Science and Technology
Department of Educational Technology
Federal University of Technology Minna,
Niger State.
ibrahimkuta@futminna.edu.ng
08035837865

Musa Jephtha Ali
School of Science and Technology
Department of Educational Technology
Federal University of Technology Minna,
Niger State
Jeffdifason@gmail.com
07037714969

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ABSTRACT

The Study investigated Availability, Readiness and Utilization of Smartphones among Biology students of Colleges of Education in Gombe State, Nigeria. The study Adopted a Descriptive Survey research design. To guide the study, five specific objectives, five research questions and two research hypotheses were formulated and tested at 0.05 alpha level. The population of the study was 392 NCE I, II, III Students from Biology Department of School of Science Education in the two Colleges of Education in Gombe State. One hundred and eighty-two Students constitute the sample size for the study using research advisor sample size for determining table. The instrument for generating data for the study was a checklist and twelve researcher's designed questionnaire which was validated by two experts in Educational Technology Department from Federal university of Technology Minna and one expert in Counselling Psychology Department from Ibrahim Badamasi Babangida University Lapai Niger State. Pilot test was conducted and reliability coefficient /index of 0.86 and 0.90 was obtained the instrument was administered on all respondents and retrieved back immediately. A checklist was used to answer research question Mean and Standard Deviation were used to answer question two and t-test statistics was used to answer research question four and five respectively. A Decision rule of 2.50 mean score and above was considered agreed while mean below 2.50 was considered disagreed. From the result study hypothesis one revealed that all Biology Students in Colleges of Education has p hypotheses two revealed that College Students smartphones are ready for Utilization respondents agreed with 3.06 Grand mean score. findings reveal that respondents agree smartphones are Utilized for learning with Grand mean score of 3.04. the findings also reveal there is no significance difference in Gender of Readiness and Utilization of smartphones learning. Among the recommendations is Service providers should reduce internet service so that students can afford and use mobile Internet services with ease.

1

INTRODUCTION

The fundamental aspect of all human lives today is Technology and cannot be neglected because of its contribution in the welfare of human beings. The emergence of modern technology led to the invention of mobile phone which has become an essential part of people's daily life and a valuable means of information dissemination since its inception in the late 1990s' in Nigeria and in most developing countries. Mobile phone has become an instrument for the rapid increase in telecommunication accessibility in Nigeria as the number of telephone lines is about thirty million (Omeruo, 2009)

In Nigeria, the emergence of mobile phone has brought about a profound diversification of knowledge. Nigerians have joined the rest of the world on social media sites such as Facebook, WhatsApp, and twitter with a quite number of them visiting those sites daily through their mobile phones. Smartphone has been in existence for about two to three decades to date when one of the largest communications and technology company "Apple" introduced the smartphone to the free market, yet smartphone was already being produced and marketed since 1993 (Sarwar & Soomro, 2013). Smartphones have developed more consideration and becoming increasingly popular in the market the impact of these smartphones fastens telecommunication through information communication technology these days. Information communication technology (ICT) which refers to the technology that provides access to information through Telecommunication, Modern information technologies have also created a 'global village 'in which people can communicate with others as if they were living next door. Information communication technology in education was viewed as ""diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information."(kale 2016).

A mobile phone that performs many of the functions of a computer, typically having a touch screen interface, Internet access, and an operating system capable of running downloaded applications is called a smartphone. In recent years, the purpose of cell phone has shifted from a verbal communication tool to a multimedia tool, which is very useful in teaching and learning process (Amanda, 2015)

Smartphones were first produced in April 1973 the first cellular phone call was placed by a general manager at Motorola the role played by the cellular devices can only be effective when the device readily available for use.

availability of affordable devices (smartphones) is the growing ecosystem of refurbished devices, and increasing internet penetration are fueling the switch to Smartphone, especially in the African region. In the larger African countries, like Nigeria and Kenya, Smartphone remain the primary medium to access internet services. The availability of these Smartphone is providing a new frontier for the application of educational technology within the academia for effective learning learners. it is an indisputable fact that owning a Smartphone has become a popular culture among Nigerian teachers and students (Liadi, 2016).

possession of these mobile devices seems to have become normative and stands as one of the s of student's identities on campus. It appears fashionable among Nigerian students to be seen advanced mobile communication device such as Smartphones with high capacities and

advanced features. When Smartphone's are effectively and efficiently utilize as expected by students, it brings about a totality of permanent change in behavior of the concern Student

The aim of this study is to it explored college students' readiness to utilize their Available smart phones in learning in Education. The education system must therefore modify its teaching methods for the oncoming wave of digitally-proficient students, their skills, experiences and needs

Statement of the Problem

In this 21 century Smartphone can be used to support, encourage and to improve teaching learning which give a latest output in the educational system. Today students need the knowledge and skills of modern technologies to develop and become digital immigrant moving towards becoming a global standard student who should be able to explore the internet for Educational purposes producing a twenty-one century students with good level of awareness to modern technology among other factors has prompted the researcher to embark on the survey research Availability, Readiness and Utilization of Smartphone for learning among Biology students of College of Education in Gombe State.

Aims and Objectives of the Study

The Aim of this research is to explore the Availability, Readiness and utilization of Smartphone for Learning among college of Education Biology Students for Education purpose in Gombe state, Nigeria. Specifically, this study will;

1. Examine Availability of Smartphone among Biology students in Colleges of Education in Gombe State.
2. Determine Biology Students' Readiness towards the use of Smartphones for learning in Colleges of Education Gombe State.
3. Determine male / female Biology Students Utilization of Smartphone's for learning in Colleges of Education in Gombe state.

Research Questions

The following research questions were drawn in line with the researcher's objectives;

1. Examine with a Checklist the Availability of Smartphone among Biology students of Colleges of Education in Gombe State.
2. To what extent is the Readiness of Biology students Smartphones in Colleges of Education Gombe towards learning.?
3. What is the degree at which male / female Smartphones are Utilize for learning among Biology Students in Colleges of Education?

Research Hypotheses

The following null hypotheses were raised and were tested at 0.05 margin of error;

1. There is no significant difference between male and female Readiness to use Smartphones for Learning Biology among Colleges of Education in Gombe State.
2. There is no significant differences between male and female Students Utilization of Smartphones for Learning Biology among Students in Colleges of Education in Gombe State, Nigeria.

3

Significance of the Study

This study will be significant to Students, pre-service Teachers, lecturers, Curriculum planners School authorities, government, and the society at large. It is expected that the study may possess all the potentials to assist in solving some educational problems through enlighten those in position to understand the expensive nature of education and stimulating them to provide adequate fund for the smooth enrolment of education at all level in Nigeria.

The Study covers Federal College of Education (Technical) Gombe and College of Education Billiri Gombe State. the researcher decided to use the two Colleges of Education in Gombe state due to proximity, closeness and funding among others. NCE 1, NCE 2 and NCE 3 Biology students of Biology Departments in the School of Science of the two Colleges of Education for his study to elicit good response from the students across the three sets. on the proposed Topic which has help the researcher to obtain an excellent result at the end of his research work The researcher also carry out this study within six weeks.

Basic Assumptions

This study is predicated on the following assumptions.

1. Smartphones are available among Biology Students' for Learning in Colleges of Education in Gombe state, Nigeria.
2. Students smartphones are Ready towards Utilization for Learning among Biology Students' in Colleges of Education Gombe State.

LITERATURE REVIEW

Literature will be review under the following headings

2.1   Conceptual Framework

2.2.   Theoretical frame work

2.3   Empirical Studies

2.4   Summary of literature review

RESEARCH METHODOLOGY

Research Design

The design for this study was a descriptive survey research design that deal with series of questions and other prompts for the purpose of gathering data from respondents. Survey research is the process of collecting representative sample data from a larger population and used the sample to infer attributes of the population (Chukwama, 2012). This design was adopted because the study is concerned with the collection of people's opinions which served as the primary source of data. The researcher used this method in order to have the opinion of Colleges of Education students toward the Availability, Readiness and Utilization of smartphone for Learning among Biology Students of Colleges of Education in Gombe State, Nigeria.

4

Population of the Study

The population for this study comprises of 392 NCE I, II, III Biology students of Federal college of Education (technical) Gombe and College of Education Billiri Gombe State.

The sample for this study was a representation of Biology Department in the school of science which will be selected from the two Colleges of Education in Gombe State. 182 NCE II Biology Students was used as the target population by chance. The researcher adopted research advisor table to determine 182 sample size, The research advisors (2006)

Table 3.4 Distribution of Population among Biology Students of Colleges of Education in Gombe State, Nigeria.

S/No	Institutions	No of Students	sample population	Male	Female
1	NCE 1	151	69	39	30
2	NCE 2	128	58	37	21
3	NCE 3	113	55	36	19
	TOTAL	392	182	112	70

Source; HOD Biology Dept. COE Billiri and Exam officer FCE(T) Gombe 2019/2020 academic session.

The instrument (questionnaire) was validated by two experts from the Department of Educational Technology, Federal University of Technology, Minna and one from Department of Counseling Psychology, Ibrahim Badamasi Babangida University Lapai.. The instrument for data collection was subjected to pilot testing. The reason for pilot testing is to ensure reliability of the instrument before data collection. The researcher pilot tested the instrument on 30 NCE II Students from Biology department of School of Science Federal College of Education (T) Gombe. Who is part of the population but are not part of the sample. The instrument was administered randomly to the thirty students and collected back after completion. The administration was done and a reliability coefficient of 0.90 and 0.85 from the variables Readiness and Utilization was obtained using Cronbach alpha statistical instrument was used to establish the reliability coefficient. George and Malley. (2003) Alpha coefficient above 0.70 is considered acceptable. This confirms the acceptability of the coefficient obtained and reliability of the instrument. The exercise was done in three days

Method of Data Analysis

. Mean and standard deviation was used to answer the research questions and independent t-test will be used to test all the null hypotheses at 0.05 level of significance and a decision mean leve of 2.50. using Statistical Package for Social Sciences (SPSS) version 22.0.

Research Question One: Determine the Availability of Smartphones among Biology Students' in Colleges of Education in Gombe State.

In answering research question one, descriptive statistic was used. Table 4.1 shows the analysis.

Table 4.1 Types of Smartphones Availably Owned for Learning among Biology Students' of Colleges of Education in Gombe State.

S/NO	TYPE OF SMARTPHONE OWNED BY STUDENTS	Number available	Percentage (%)
1.	Android OS	25	13.74
2.	Apple IOS	10	5.49
3.	Gionee	12	6.59
4	HTC Dream	14	7.69
5	Nokia E	01	0.55
6	Nokia Symbian N72-760	10	5.49
7	Samsung galaxy Note 10 series	05	2.75
8	Techno	48	26.37
9	Infinix Hot / Note	35	19.23
10	Specify others not above	20	10.99
11	I don't own a phone	00	00.00

Table 4.1 shows the Smartphones Availably owned by Biology Students of Colleges of Education in Gombe State. It shows that it is Techno Smartphones Biology Students own most with 48 (26%), followed by Infinix Hot / Note with 35 (19.23 %), Android OS with 25 (13.74%), other types of phones with 20 (10.99%), HTC dream with 14 (7.69%), Gionee phones with 12 (6.590%), Apple IOS with 10 (5.49%), Nokia Symbian with 10 (5.49%), Samsung galaxy Note 10 series with 05 (2.75%) while the least type of phone owned is Nokia E with 1(0.55%). The table revealed that all Students own a Smartphone. Thus, the Availability of Smartphones is high among Biology Students in Colleges of Education Gombe State.

Research Question two: What is the mean Readiness scores of Biology Students' towards the use of Smartphone among Colleges of Education Gombe State.

In answering research question two, Descriptive Statistic of Mean and Standard Deviation was used. Table 4.2 shows the analysis.

Table 4.2: Mean Readiness scores of Biology Students' towards the use of Smartphone among Colleges of Education Gombe State

S/N	Items	Mean	SD
1	I am ready to access Educational applications with my Smartphones.	3.00	1.00

S.N	Items	Mean	SD
	I am ready to use my Smartphone 3G 4g service for learning	3.10	0.90
	My Smartphone is ready to access Educational Learning Sites	3.15	0.88
	My Smartphone is ready for storage of Digital files for future use	3.02	0.98
	My Smartphone is ready to Access social media sites Facebook, twitter, WhatsApp.	3.05	0.95
	I am ready to download and save social media information (video, pictures, messages etc.) for and learning	3.08	0.92
	Grand mean	**3.06**	

Decision mean: 2.50

Table 4.2 shows the mean and standard deviation of Students response on Readiness of Biology Students smartphones in College of Education Towards utilization for learning with a total number of 182 responded to six items each. The table revealed computed Mean Score of 3.00 with Standard Deviation of 1.00 for item one, mean score of 3.10 with Standard Deviation of 0.90 for item two, Mean Score of 3.15 with Standard Deviation of 0.88 for item three, Mean Score of 3.02 with Standard Deviation of 0.98 for item four, Mean Score of 3.05 with Standard Deviation of 0.95 for item five, Mean Score of 3.08 with Standard of 0.92 for item six. Respondent agreed with all the six items, the least mean score was 3.00 while the highest mean score was 3.15 and the grand mean score was 3.06 which is greater than the Decision mean (2.50) this implies that Biology Students' Smartphones are Ready for utilization is high towards Learning in Colleges of Education Gombe.

Research Question three: What is the mean Utilization scores of Biology Students' towards use of Smartphones among Colleges of Education Gombe State?

In answering research question two, Descriptive Statistic of Mean and Standard Deviation was used. Table 4.3 shows the analysis.

Table 4.5 The mean Utilization scores of Biology Students' towards use of

Smartphones among Colleges of Education Gombe State

S.N	Items	Mean	SD
1	When I use my Smartphones, it helps me increase my motivation to learn Biology more	2.98	1.02
2	Using Smartphone enable me accomplish learning task more easily with my classmates	2.87	1.13
3	Smartphone enables me to communicate more easily with my classmates and lecturers. Through group chat	3.02	0.98
4	Efficient use of Smartphone enables me do my Biology Assignments effective and efficiently.	3.11	0.89
5	When I use Smartphones, it has Specific Biology Applications that Aid in my Critical thinking of Learning.	3.14	0.86

| | | | | 3.09 | 0.91 |
| Using Smartphones with specific Educational Software has increased my Test scores in the College. | | | | | |

Grand Mean

Decision mean: 2. 50

| | | | | | 3.04 |

Table 4.3 shows the mean and standard deviation of Students' response on Utilization of Smartphones for learning among Biology Students' in Colleges of Education, with a total number of 182 responded to six items each. The table revealed computed Mean Score of 2.98 with Standard Deviation of 1.02 for item one, mean score of 2.87 with Standard Deviation of 1.13 for item two, Mean Score of 3.02 with Standard Deviation of 0.98 for item three, Mean Score of 3.11 with Standard Deviation of 0.89 for item four, Mean Score of 3.14 with Standard Deviation of 0.86 for item five, Mean Score of 3.09 with Standard of 0.91 for item six. Respondent agreed with all the six items, the least mean score was 2.87 while the highest mean score was 3.11 and the grand mean score was 3.04 which is greater than the Decision mean (2.50) this implies that Biology Students' Utilization of Smartphones is high towards Learning in Colleges of Education Gombe.

Research Hypotheses

All hypotheses were tested at 0.05 level of significance.

HO1: There is no significant difference between male and female Readiness of Smartphones for Learning among Biology Students' in Colleges of Education in Gombe State, Nigeria

In answering the hypothesis one, t-test statistics was used, Table 4.4 shows the analysis.

Table 4.4: Difference between Male and Female Readiness of Smartphone for Learning Biology Students in Colleges of Education Gombe State.

Gender	No	$\bar{x}$	SD	Df	t-cal.	p-value
Male	92	2.93	0.54	180	0.20	0.110
Female	90	2.94	0.38			

Ns= not significant at 0.05

Table 4.4 shows the t-test of male and female biology students' Readiness to use Smartphones for Learning. The table indicates that the stated null hypothesis was accepted. This was because t 2.932) = 0.20, p-value of 0.110 greater than 0.05 level of significance. By implication, the stated null hypothesis was established thus: there was no significant difference between male and female Readiness of Smartphone for Learning among Biology Students in Colleges of Education Gombe ate.

O2: There is no significant difference between male and female in the Utilization of Smartphones Learning among Biology Students in Colleges of Education in Gombe State, Nigeria.

answering the hypothesis two, t-test statistics was used, Table 4.5 shows the analysis.

Table 4.5: Difference between Male and Female Biology Students' Utilization of Smartphones for Learning in colleges of Education Gombe

Gender	No	$\bar{X}$	SD	Df	t-cal.	p-value
Male	92	3.19	0.50	180	0.226	0.122
Female	90	3.22	0.36			

Ns= not significant at 0.05

Table 4.5 shows the t-test of male and female in the Utilization of Smartphones for learning. The table indicates that the stated null hypothesis was accepted. This was because t (3.192) = 0.20, p-value of 0.122 greater than 0.05 level of significance. By implication, the stated null hypothesis was established thus: there was no significant difference between male and female in the Utilization of Smartphones for learning among Biology Students' in Colleges of Education Gombe State.

Summary of Findings

1. Smartphones are available among Biology Students' in Colleges of education in Gombe State.
2. Smartphones are ready for utilization towards Learning among Biology Students' in Colleges of Education Gombe State.
3. Biology Students in Colleges of Education in Gombe State Utilize their Smartphones for learning Biology effectively.
4. There is no significant difference between Male and Female Readiness to use Smartphone for Learning Biology among Colleges of Education Gombe State.
5. There is no significant difference between Male and Female Students' Utilization of Smartphone for Learning Biology among colleges of Education in Gombe State

Discussion of Findings

The study reveals that, smartphones are Available among Biology Students' in Colleges of education and the commonest smartphones used is Techno smartphone products. The result from the findings reveals that, out of the 182 respondents on Smartphones availability ,Tecno products has 48 (26%), followed by Infinix Hot / Note with 35 (19.23 %), while the least type of phone owned is Nokia E with 1(0.55%)and the least which is Nokia E 1 with 0.55% while 0 with .00% represent those that don't have a smartphone stereos. the findings agree with Alfawareh and Jusoh (2014) revealed that, 94.4 percent of students owned a Smartphone, and majority of them used it as a computer and a digital camera.

The finding also reveals that most Biology Students' in Colleges of Education Gombe has Smartphones that are ready for academic utilization. This finding is in line with that of Msuya (2015) who found out that, most students own a smartphone; these Smartphones are equipped with cameras, true color displays, external memory cards and sound stereos

Findings from the research also reveals that College Students' Utilize their smartphones for Academic purposes is in line with the finding of Wulystan, *et al* (2012) who says that, students

use their smartphones to download course related materials, while some mentioned that, they use their smartphone for taking photos during study activities. Basing on these findings, most students used their smartphone for various academic purposes.

The result of the study also reveals that, smartphones should be used for learning. However, they disagreed with the idea of allowing them to use their smartphone during lectures. This finding is in line with that of Zvjezdana, *et al* (2015) opine that, students commonly use smartphones for learning and consider smartphones to be very useful for their academic work: they use smartphones to access course materials, search library catalog, discuss course assignments with peers and take notes.

The finding of the study shows that there is no significant difference between Male and Female Readiness to use Smartphones for Learning among Students in Colleges of Education Gombe is in line with this finding, Evans, Hopper, Jones & Knezek (2013) states that, female students are more focused on learning task than male students. Wilson (2000) stressed that, female students send and receive electronic mails through smartphone than male students.. Another finding indicates that, boys scored higher than girls for using their smartphone for sending emails, playing games, listening to music, and sharing pictures and videos (Cotten, etal, 2009). Female college students possessed more positive attitudes toward smartphone than males (Zhang, 2002). Male college students were more likely to use smartphone for recreational purposes, information gathering and entertainment while females preferred to use the smartphone for communication (Shaw & Gant, 2002

The study finally reveals that there is no significant difference between Male and Female Students' Utilization of Smartphone for Learning among Biology Colleges of Education Gombe. female faced more challenges in the educational utilization of smartphone than their male counterpart. In support to the above finding, Evans, Hopper, Jones & Knezek (2013) lament that, male is more active in free exploration and learning new applications than females' students. Male discover basic functions of smartphones faster and easier than female student. In addition, female students are more focused on the learning task than male students, but they may accidentally interrupt by problems in operating the smartphone device than male do.

Conclusion

It was deduced from the study that: Smartphones are availably owned by all Biology students' in Colleges of Education Gombe state. It was also agreed that Biology Students Smartphones are Ready for use towards Learning in Colleges of Education Gombe State. The Study further agreed that Biology Students in Colleges of Education Gombe Utilizes their Smartphones for Learning. However, there is no significant difference in Male and Female Readiness to use Smartphones for learning Biology among Colleges of Education in Gombe State. finally, there is no significant differences between Male and female Utilization of Smartphones for learning Biology among Colleges of Education in Gombe State.

REFERENCES

Abroms, C, Padmanabhan, N, Thaweethai, L. & Phillips, T. (2011) iPhone apps for smoking cessation: a content analysis. Am J Prev Med 2011 Mar;40(3):279-285.

Abu-Hassna, H. M, & Amin, I. M. H. (2014). Student'sfeedback and perception regarding mobile phone application: InternationalJournal of Research in Engineering & Technology, 2 2347-459.

Babbie, (2001). The practice of social research 4th Belmont California:Wadsworth(89).

Barker, A., Krull, G., & Mallinson, B. (2006). Proposed theoretical model for m-learning adoption in developing countries: Rhoden University South Africa: Retrieved from http://www.search.ebscohost.com

Chen,B., & Denoyelles, A. (2013). Exploring students' mobile learning practices in higher Education:Journal of Special Education Technology; 3 (57)

Gambari. I. A, Gbodi. B. E, Olakanmi. E. U, & Alabaka. E. N. (2016) Promoting intrinsic and extrinsic motivation among chemistry students using computer-assisted instruction; Contemporary Educational Technology, 7(1), 25-46.

Madden, C. (2010). The use of smartphone among students in relation to their education and social life University of Ireland, Ireland

Mafenya

Seifert, T. (2014). Pedagogical applications of smartphone integration in teaching Students' & Pupils' Perspectives: Retrieved from https://www.learntechlib.org/p/158086/.

vjezdana, D. Dickson K. W. Chiu & Patrick, L (2015) "How useful are smartphones for learning? Perception and practices of library and information science students from Hong Kong and Japan" Library Hi Tech, Vol 33 Issue: 4(545-561), https://doi.org/10.1108/LHT-02-2015-0015.