



Gender and Academic Utilization of Smartphone among Pre-service Teachers in Nigeria

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ABSTRACT

The study investigates "Gender and academic Utilization of Smartphone among Pre-service Teachers" The design adopted for this study was a descriptive survey research design. The study was guided by two research objectives, two research questions and two null hypotheses which were tested at (0.05) level of significance. The population for the study is fifteen thousand one hundred and three pre-service teachers from three colleges of education. A random sampling technique was used to determine the sample from the population. The sample has a total population of 4826 pre-service teachers. The sample size of 357 was obtained using Krejcie and Morgan Table for determining sample size. The instruments used for data collection was a research questionnaire titled smartphone availability questionnaire which was adapted from Anigbo (2015) and validated by three experts. Frequency count and the percentage was used to analyze the demographic data, the mean and standard deviation was used to answer the research questions and independent t-Test was also used in testing the null hypotheses at (0.05) level of significance. From the result, all null hypotheses were rejected. The findings indicate that the gender gap exists among pre-service teachers in the academic utilization of smartphone in colleges of education. Male pre-service teachers use their smartphone to do assignment than female counterpart while female pre-service teachers read and download e-books using their smartphone than their male counterparts. Gender gaps exist among pre-service teachers in the challenges faced during academic utilization of smartphone in colleges of education. Female pre-service teachers face difficulties when uploading, locating and downloading relevant educational documents using smartphones than their male counterpart.

ARTICLE INFO

Article History

Received: March, 2020

Received in revised form: June, 2020

Accepted: August, 2020

Published online: November, 2020

KEYWORDS

Smart phones, academic utilization,
pre-service teachers

INTRODUCTION

Technology advancement leads to certain changes in the present educational system. The penetration of technology into

the learning cycle causes changes in methods of delivering learning content and also in the learning processes. Mobile learning is identified by Lan and Sie (2010)



as a new type of learning process which allows learners to receive learning materials without limitation of time and place through wireless telecommunications network and internet.

Smartphone increases the flexibility of learning and gives a sense of learning freedom to the learners. In the same vein, roles of teachers in modern ways of learning also changed from mere knowledge deliverance to knowledge facilitators and always guide learner's to discover knowledge by themselves in line with the learning content (Marites, P.H., & Saovapa, W. 2017).

Smartphones are no longer considered as simply as "ordinary phones", but it considered a powerful information provider and portable computers. This is because these portable devices provide functions that distinguished them from ordinary mobile phones such as powerful camera, reliable multimedia players, internet connection, navigation system and e-mail service as well as facilitate social networking and games. As smartphones were developed in recent years, it's penetration into the academic cycle becomes more paramount.

Objectives of the Study

The following are among the objectives of this research.

1. To find out gender differences in the academic utilization of smartphone among pre-service teachers.
2. To find out the challenges faced by male and female pre-service teachers in the academic utilization of smartphone.

Research Questions

The following research questions were drawn in line with the research objectives.

1. Is there any gender difference in academic utilization of smartphone among pre-service teachers?

2. What are the challenges faced by male and female pre-service teachers in academic utilization of smartphone?

Null Hypotheses

The following null hypotheses were tested at 0.05 levels of significance.

1. There is no significant difference between male and female pre-service teachers in the academic utilization of smartphone.
2. There is no significant difference between male and female pre-service teachers in the challenges faced during academic utilization of smartphone.

Basic Assumptions

This study is predicated on the following assumptions:

1. Males pre-service teachers utilized their smartphone for academic purposes than females pre-service teachers.
2. Males' pre-service teachers faced a lot of challenges during academic utilization of smartphone than females' pre-service teachers.

LITERATURE REVIEW

Most scholars agreed that the gender gap exists in the use of smartphone among college students as well as the general population. Furthermore, some gender differences had been found in attitude towards mobile technology, the intensity of Internet use, online applications preferred and experience in cyberspace (Ono and Zovodny, 2003). Smartphone usage differs based on the gender of the participant. Females spend more time on their phones than males, they spend on average per day 166.87 minutes (SD = 91.95), while males spend 154.26 minutes (SD = 92.78). Women spend more time in communication and social apps while men spend more time playing games (Andone and Blaszkiewicz, 2016).



Another research finding indicates that boys scored higher than girls for using their mobile phones for sending emails, playing games, listening to music, and sharing pictures and videos. Boys are often taught to explore and be more creative with technology; they tend to use mobile devices as a gadget. Girls traditionally have perceived themselves as less skilled in terms of technology. It is argued that it has a lot to do with gender socialization. "If this perception continues, it can limit young girls. It can impact the types of jobs and courses that girls take', hence it could lead to a different type of digital divide' (Cotten, Anderson & Zeynep 2009).

Technologies were not utilized in similar ways by men and women and as a result some differences still existed (Mitra et al., 2005). Another research among Chinese and British students found that men in both countries used email and chat, played games and were confident about their smartphone more than their female counterparts (Li and Kirkup, 2007). It was suggested that women had to increase their level of involvement with a smartphone and both teachers and parents had to support them in this (Shashaani and Khalili, 2000). However, another study contradicted these findings and reported that gender had no significant effect on any of the dimensions of smartphone attitude studied (Shaw and Gant, 2002).

Female college students possessed more positive attitudes toward smartphone than males (Zhang, 2002). Another research pointed out that males tend to try new things, while females preferred traditional ways. However, girls tend to use smartphone media more often than males (Trifonova et al., 2006). The gender difference was also found regarding the use of web applications. Male college students were more likely to use the Internet for recreational purposes, information gathering and entertainment while females

preferred to use the Internet for communication (Shaw & Gant, 2002).

Furthermore, females tend to be social as they used e-mail and instant messaging more than their male peers (Media Report for Women, 2000). Gender differences also exist in sending and receiving electronic mails through a smartphone, messaging was the most important function of the Internet used by females (Wilson, 2000). Females used the email more than males (Boneva et al., 2001). Females made more calls and sent more SMS messages with a smartphone than men did. Also, teenage girls used their devices more frequently to express their feelings while boys were more interested in the technical aspect (Doring et al., 2004). Saunders and Quirke (2002) state that, males expected the new technology to offer to them easy and quick answers, they also work alone or sometimes in pairs. On the other hand, females were interested in the quality of the product and they preferred interactive group work. It is worth mentioning that females tend to study online more than men as online learning may be appropriate for women's lifestyles and they were also more likely to look for further views of education (Selwyn, 2006). Moreover, Selwyn (2006) reported that as the current situation changes, educational technology can be seen as a predominantly feminine activity.

Economides and Grousopoulou, (2008), Females appear to make more phone calls than male. Moreover, they take more photos and record more sounds than their male peers. Also, they listen more hours to music than men and they tend to send and receive more messages from friends. On the other hand, males tend to access the Internet via their smartphone devices than females. Furthermore, both groups find reasons to reduce the usage of their mobiles, but men mention more reasons than women do. They believe that



loss of time and addiction are reasons for decreasing the use of the devices.

Challenges in Smartphone Utilization among Male and Female Students

Goal number five of the United Nations (UN) education for all policy is to provide equal opportunity for education regardless of gender bias by the year 2015 (UNESCO 2013). The greatest opportunity to achieve this is to facilitate informal learning by using mobile devices. However, gender differences can be observed among students depending on the nature of the smartphone they owned, these differences exist in context and usage scenario. Boys are more active in free exploration and learning new applications - games in particular. They discover the basic functions of the phone faster. Girls are more focused on the learning task but maybe accidentally interrupted by problems in operating the device. However, research on using smartphones to support different learning tasks did not show significant differences by gender (Evans, Hopper, Jones & Knezek 2013).

The increasing adoption of mobile devices could help girls break through the misconception of technology as a “male thing”. However, the use of smartphone devices does not show similar gender differences. Both genders love those gadgets, but parents and teachers do not point out that girls, as well as boys, can create sophisticated applications with them (Grimus, 2013). The notion of boys being more tech-savvy than girls seems a misconception. It restricts girls internally

from entering a more technological way of life as they grow. To leverage the meaning that girls may not see themselves as technical, but love their smartphones, they can tap into technology with their gadgets and increase their confidence in the technology. Getting to know technology doesn't necessarily mean that one needs to know things like computer programming. Constant encouragement and exposure to smartphones can open girls' minds to pursue and support their technical knowledge (Grinus, 2009).

RESEARCH METHODOLOGY

The design for this study was a descriptive survey research design. Survey research design is a type of descriptive research that deals with a series of questions and other prompts to gather 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).

The target population for this study comprises of all pre-service teachers of colleges of education in Yobe state. College A, college B and college C. college A have a total number of seven thousand one hundred and forty-two pre-service teachers; college B has a total number of seven thousand one hundred and ninety-three pre-service teachers while college C has a total number of seven hundred and sixty-eight pre-service teachers. Therefore, the total population for this study is fifteen thousand one hundred and three pre-service teachers.

Table 1: Distribution of Population among Yobe State Colleges of Education

S/No	Institutions	No of Students
1.	College A	7,142
2.	College B	7,193
3.	College C	768
TOTAL		15,103

Source: Academic Office of the respective Colleges of Education, 2016/17 academic session.



The sample is a subset of a population that is used to represent the entire group as a whole (Chukwama, 2012). The sample for this study is a representation of each college by one school which was selected randomly. Random sampling technique is the selection of individual randomly from the population, in which all members of the population have an equal chance of being selected. Therefore, college A has four schools namely School of education, science education, technical education and vocational education. Whereby, the school of science education was randomly

selected. In college B, there are four schools namely- school of education, science education, vocational education and art and social sciences. In college B, school of vocational education was randomly selected while in college C, there is a school of Art and social sciences and school of education in which school for Art and social science was randomly selected.

The researcher adopted Krejcie and Morgan (1970) table for determining sample size. Therefore, according to the table, the sample size of four thousand eight hundred and twenty-six is three hundred and fifty-seven.

Table: 2: Sample and Sample size of the Colleges of Education in Yobe State

S/N	Institutions	Sample of PST	Sample Size of PST
1.	School A	1985	146
2.	School B	2073	154
3.	School C	768	57
	TOTAL	4826	357

The instruments used for data collection was a questionnaire titled students smartphone availability questionnaire (SSAQ) which was adapted from Anigbo (2015) questionnaire. The questionnaire consists of two sections; section A and section B. Section A deals with respondents' demographic data while section B contains nineteen questions. Section B was subdivided in two. Sub-section one contained ten questions on the gender difference in the academic utilization of smartphone while sub-section two contains nine questions on the challenges faced by male and female pre-service teachers during academic utilization of smartphone.

The questions were structured in line with five Likert scales which was modified into four responses: Strongly Agreed (SA) = 4, Agreed (A) = 3, Strongly Disagreed (SD) = 2 and Disagreed (D) = 1. Hilary (2003) says that the number of

choice on the scale should be evenly balanced and retains a continuum of positive and negative statements with which the respondent is likely to agree or disagree to help in reducing or avoiding the problem of bias.

The instrument was validated by three experts, one from the Department of educational technology, English department and the mathematics and statistics department. At the initial stage, the questionnaire comprises of twenty-six questions but was later reduced to nineteen during validation. Questions three, six, nine, ten, twelve, fourteen and seventeen were removed while questions one, two and twenty-five were modified or restructured. All corrections, modifications and suggestions were observed accordingly before producing the final copy.

The instrument for data collection was subjected to pilot testing. The reason for pilot testing is to ensure the reliability



coefficient of the instrument before data collection. The researcher pilot tested the instrument at college of education Azare, Bauchi State; which is out of the target population but shared similar characteristics. The instrument was administered randomly to thirty pre-service teachers and collected back after completing. According to Stephanie (2017), the instrument should be administered to a large group of over thirty members of the pilot test area. The whole process took place in a day.

Reliability of the instrument was tested using the split-half method in order to assess the internal consistency of the instrument and the reliability coefficient of 0.75 was established using Cronbach Alpha. Olayiwola and Stevens (2001) say that an instrument is considered more reliable if its calculated reliability coefficient is closer to 1 and less reliable when the calculated reliability coefficient is closer to 0.

The researcher administered and collect back the filled questionnaire with the help of a research assistant. One hundred and sixty questionnaires were distributed at school A, one hundred and sixty questionnaires were also administered at school B and seventy questionnaires were

distributed at school C. A total of 329 questionnaires were distributed across the institutions. The questionnaire was administered randomly to the respondents and the sum of three hundred and sixty-four completed questionnaires was collected back. Twenty-six questionnaires were missing and during sorting, twenty-two was found wrongly completed. The total of three hundred and forty two correctly completed questionnaires was used as a source of data.

Data collected was analysed using Statistics Package for Social Sciences (SPSS). The study employed frequency counts and percentage to explain the demographic data. Mean and standard deviation was used to answer the research questions and independent t-test was also used to test all the null hypotheses at 0.05 level of significance.

RESULTS

This section presents the result of the analysed data under the following sub-headings: analysis of demographic data, answers to the research questions, testing the null hypothesis, summary of findings and discussion of the major findings.

Table 3: Distribution of Pre-Service Teachers Responds based on Gender

S/N	Gender	Frequency	Percentage
1.	Male	181	52.9
2.	Female	161	47.1
Total		342	100.0

Table 4.1 indicates that, one hundred and eighty one pre-service teachers which represent 52.9% are male while one hundred and sixty one which represent 47.1% are female. This is normal if general population of northern part of this country will be considered.

Research Question one: Is there any gender difference in the educational utilization of smartphone among pre-service teachers in colleges of education in Yobe State? The responds regarding research question four was analysed using mean and standard deviation as presented in Table 4.6.



Table 4: Mean and Standard Deviation of Pre-service Teachers on Gender Difference in the Educational Utilization of Smartphone in Colleges of Education in Yobe

S/N	Items	Mean	SD	Decision
1.	Male pre-service teachers use their smartphone to do assignment than female counterpart.	2.50	1.15	Agree
2.	Male pre-service teachers search relevant educational information through their smartphones than female counterpart.	2.70	1.06	Agree
3.	Male pre-service teachers read and download e-books using their smartphone than female counterparts.	2.23	1.02	Disagree
4.	Male pre-service teachers visit social media with their smartphones to get hints about their courses than female counterparts.	2.73	1.01	Agree
5.	Male pre-service teachers watch online academic activities and download relevant educational videos with their smartphone than female counterparts.	2.31	1.08	Disagree
6.	Female pre-service teachers send educational SMS and e-mail with their smartphones daily than their male counterpart.	2.83	0.99	Agree
7.	Female pre-service teachers utilize social media sites with their smartphone for educational purposes than their male counterpart.	2.69	0.98	Agree
8.	Female pre-service teachers download and utilize educational applications through their smartphone than their male counterpart.	2.15	0.96	Disagree
9.	Female pre-service teachers get educational assistance from experts through their smartphones than their male counterpart.	2.73	1.05	Agree
10.	Female pre-service teacher make effective and efficient utilization of their smartphones for educational purposes than their male counterpart.	2.21	1.10	Disagree
Cumulative Mean		2.51		

Decision Mean = 2.50

Table 4.6: highlighted the gender differences in the educational utilization of smartphone among pre-service teachers. The result indicates that, gender difference exist among pre-service teachers in the educational utilization of smartphone in colleges of education in Yobe state. According to the above table, the cumulative mean of 2.51 is greater than the decision mean of 2.50. Male pre-service teachers use their smartphone to do

assignment than female counterpart while female pre-service teachers read and download e-books using their smartphone than male counterparts.

Research Question two: What are the challenges faced by male and female pre-service teachers in the educational utilization of smartphone in colleges of education in Yobe State. The responds regarding research question five was



analysed using mean and standard deviation as presented in Table 4.7.

Table 5: Mean and Standard Deviation of the Challenges Faced by Male and Female Pre-service Teachers in the Educational Utilization of Smartphone in Colleges of Education

S/N	Items	Mean	SD	Decision
1	Male pre-service teachers face difficulties when operating smartphone than their female counterpart.	2.25	1.04	Disagree
2	Female pre-service teachers face difficulties when uploading, locating and downloading relevant educational documents through smartphones than their male counterpart.	2.89	0.96	Agree
3	Male pre-service teachers face difficulties in searching online educational documents through smartphone than their female counterpart.	2.35	1.04	Disagree
4	Female pre-service teachers are complaining about smartphone short battery life than their male counterpart.	2.50	1.11	Agree
5	Male pre-service teachers are complaining about smartphone screen size than their female counterpart.	2.55	1.06	Agree
6	Female pre-service teachers download, install and utilize smartphone educational applications with ease than their male counterpart.	2.28	0.97	Disagree
7	Male pre-service teachers lost their smartphones more frequently and easier than their female counterpart.	2.43	1.03	Disagree
8	Female pre-service teachers are complaining about smartphone limited capacity for text message entry than their male counterpart.	2.53	1.15	Agree
9	Smartphones of male pre- service teachers are more vulnerable to virus attacks than smartphone of female pre-service teachers.	2.89	1.13	Agree
Cumulative Mean		2.51		

Decision Mean = 2.50

Table 4.7: present the challenges faced by male and female pre-service teachers in the educational utilization of smartphone in colleges of education of Yobe state. The Table shows that, there is difference between male and female pre-service teachers in the challenges faced during educational utilization of smartphone in colleges of education in Yobe state. This is so because, the cumulative mean of 2.52 is greater than the decision mean of 2.50.

Testing the Null Hypotheses

The null hypotheses were tested using t-test at 0.05 level of significance. The results of the analysis were summarized as follows:

HO1: There is no significant difference between male and female pre-service teachers in the educational utilization of smartphone in colleges of education in Yobe State.



Table 6: t-Test Results of Male and Female Pre-service Teachers in the Educational Utilization of Smartphone in Colleges of Education in Yobe State

Gender	N	Df	Mean	SD	t-value	p-value
Male	181	340	1.71	0.52	-29.76	0.000*
Female	161		3.41	0.53		

*= Significant at $p < 0.05$ alpha value

Table 4.8 present mean and standard deviation of male and female pre-service teachers in the educational utilization of smartphone in colleges of education in Yobe state. The Table shows that, mean and standard deviation of male pre-service teachers are 1.71 and 0.52 while mean and standard deviation of female pre-service teachers are 3.41 and 0.53 respectively. Therefore, the null hypothesis one which says that, there is no significant difference between male and female pre-

service teachers in the educational utilization of smartphone in colleges of education in Yobe State was rejected because the p-value of 0.000* is less than the alpha value of 0.05.

HO2: There is no significant difference between male and female pre-service teachers on the challenges faced during educational utilization of smartphone in colleges of education in Yobe State.

Table 7: t-Test Results on the Challenges Faced by Male and Female Pre-service Teachers Faced during the Educational Utilization of smartphone in Colleges of Education in Yobe State

Gender	N	Df	Mean	SD	t-value	p-value
Male	181	340	1.68	0.58	-30.35	0.000*
Female	161		3.46	0.50		

*= Significant at $p < 0.05$ alpha value

Table 4.9: the analysis indicate the mean and standard deviation of male and female pre-service teachers in the challenges faced during educational utilization of smartphone in colleges of education. The mean and standard deviation of male pre-service teachers are 1.68 and 0.58 while mean and standard deviation of female pre-service teachers are 3.46 and 0.50 respectively. The null hypothesis two which says that, there is no significant difference in the challenges faced by male and female pre-service teachers in the educational utilization of smartphone in colleges of education was rejected due to the fact that, p-value of

0.000* is less than the alpha value of 0.05 (t-value = -30.35, df = 341, p-value = 0.000*).

Summary of the Major Findings

1. Gender gap exists among pre-service teachers in the educational utilization of smartphone in colleges of education in Yobe state. Male pre-service teachers use their smartphone to do assignment than female counterpart while female pre-service teachers read and download e-books using their smartphone than male counterparts.
2. Gender gaps exist among pre-service teachers in the challenges faced during



educational utilization of smartphone in colleges of education in Yobe state. Female pre-service teachers face difficulties when uploading, locating and downloading relevant educational documents using smartphones than their male counterpart.

Discussion of Findings

The finding of the study says that, gender gap exists among pre-service teachers in the educational utilization of smartphones. 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) says that, female students send and receive electronic mails through smartphone than male students. Andone and Błaszkiwicz (2016) also states that, women spend more time in communication and social applications while men spend more time playing games. 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, Anderson & Zeynep 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). However, research on the use of smartphones to support different learning tasks did not show significant differences between male and female students (Evans, Hopper, Jones & Knezek 2013).

The study also reveals that, 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 are more active in

free exploration and learning new applications than females students. Male discover basic functions of smartphone faster and easier than female student. In addition, female students are more focused on the learning task than male students, but they may accidentally interrupted by problems in operating the smartphone device than male do.

The study investigates “Gender and Academic Utilization of Smartphone among Pre-service Teachers in Colleges of Education” The design adopted for this study was descriptive survey research design. The study was guided by two research objectives, two research questions and two null hypotheses which were tested at (0.05) level of significance. The population for the study is fifteen thousand one hundred and three pre-service teachers from three colleges of education. A random sampling technique was used to determine the sample from the population. The sample has a total population of four thousand eight hundred and twenty six pre-service teachers. The sample size three hundred and fifty seven was obtained using Krejcie and Morgan Table for determining sample size. The instruments used for data collection was research questionnaire titled smartphone availability questionnaire which was adapted from Anigbo (2015) and validated by three experts. It was also pilot tested at college of education Azare. The result of the pilot testing was analysed using Cronbach Alpha and yielded a reliability coefficient of 0.75. Frequency count and percentage was used to analyze the demographic data, mean and standard deviation was used to answer the research questions and independent t-Test was also used in testing the null hypotheses at (0.05) level of significance. From the result, all null hypotheses were rejected.

The summary of findings indicates that, gender gap exists among pre-service teachers in the academic utilization of



smartphone in colleges of education. Male pre-service teachers use their smartphone to do assignment than female counterpart while female pre-service teachers read and download e-books using their smartphone than their male counterparts. Gender gaps exist among pre-service teachers in the challenges faced during educational utilization of smartphone in colleges of education. Female pre-service teachers face difficulties when uploading, locating and downloading relevant educational documents using smartphones than their male counterpart.

CONCLUSION

It was deduced from the study that, gender gap exists among pre-service teachers in the academic utilization of smartphone in colleges of education. Male pre-service teachers use their smartphone to do assignment than female counterpart while female pre-service teachers read and download e-books using their smartphone than their male counterparts. Gender gaps also exist among pre-service teachers in the challenges faced during educational utilization of smartphone. Female pre-service teachers face difficulties when uploading, locating and downloading relevant educational documents using their smartphones than male counterpart.

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