PERCEIVED INFLUENCE OF INTERNET-ENABLED MOBILE DEVICES ON ACADEMIC PERFORMANCE OF UNDERGRADUATE STUDENTS IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA

KELECHI EKWULUONU
Federal University of Technology, Minna,
Niger State, Nigeria.
kelechukwekewu02@gmail.com
&
DR. KATAMBA ABUBAKAR SAKA
University Librarian,
Federal University of Technology, Minna,
Niger State, Nigeria
s.katamba@futminna.edu.ng

ABSTRACT

This study investigated the perceived influence of Internet-enabled mobile devices on the academic performance of undergraduate students in Federal University of Technology (FUT) Minna, Niger State. The study was guided by four specific objectives with corresponding research questions. Descriptive research design was adopted. The target population of 21,617 undergraduate students in FUT, Minna as at 2019/2020 academic session was used for the study. A sample of 200 undergraduate students was selected from the target population. Convenient and simple random sampling techniques were used to select 24 undergraduate students from each of the eight schools while eight undergraduate students was randomly selected from the 9th School of Entrepreneurship and Management Technology (SEMT). Structured questionnaire with four-point rating scale was randomly and conveniently used for data collection and 200 copies were administered on the respondents across the nine schools. Results showed the return rate of 156 completed copies of the questionnaire. Data analysis was carried out using descriptive statistics. Findings revealed that majority of the respondents use different kind of Internet mobile phones for one reason or the other and are useful, and enhancement to their academic activities. It was found that Internet mobile phones have contributed to perceived academic performance of undergraduate students. Other findings include unstable power supply and network service, and high cost of data were the serious problems to the use of Internet mobile phones by undergraduate students. The study concluded that the mobile phones will enhance academic activities of undergraduate students if well utilize. It was recommended that University management should collaborate with manufacturers of mobiles phones on the appropriate mobile phones to be use by undergraduate students for their academic activities; encouragement of collaborative learning through mobile phone while University management should provide alternative sources of power supply (solar, inverter, and standby generating plant) as well as subsidizing the price of data purchase.

Keywords: Academic performance, Internet mobile devices, Nigeria, Undergraduate students, University, Technology

Introduction

Universities all over the world are established to carry out teaching, research and community services. While faculty members are expected to carry out these three (3) cardinal functions (teaching, research and community service), students are expected to not only engaged in attending and receiving lecture but also are expected to learn and embark on researches; assignment, conference, workshop, seminar, project and term paper writing and presentations. These can only and conveniently have carried out by the use of Information Communication Technology (ICT) facilities such as computer as well as Internet mobile devices. Today, IMDs are used by many people and students to browse, access, download and if possible print the information for academic and other purposes (Abbas, Aashiq, Hassan & Alam, 2020; Iqbal & Bhatti, 2020). Students especially those in institutions of higher learning like the universities can stay outside the campus to access information resources so long as they are registered online public library catalog (OPAC) users without physically present in university library (Mohammed & Saka, 2016). Researchers reported further that librarians were of the opinion that there was high level of awareness on the use of smart phones which will greatly contribute to their performance in university libraries in North-west, Nigeria.

The arrival of ICT and Internet services has had a profound impact on nearly every aspect of human life. Mobile devices are products of ICT and nowadays, they have become an integral part of everyone's lives. Most people all over the universe are adopting these innovative and fascinating technological devices as a vital tools or gadgets to support their daily life activities (Jusoh & Fawareh, 2017). Today, mobile device usage is no longer a wish, as it was in the previous two decades, but is now highly prevalent all over the world. Individuals with mobile device can now access the Internet irrespective of their locations in order to satisfy their needs. Mobile phones are used by students for academic purposes such as preparation for tests, assignment, examinations, project writing and result obtained from these academic activities are functions of academic performance, respectively.

Undergraduate students seem to used mobile devices especially smart phones for social and entertainment purposes, which negatively affects their academic performance in the university under investigation. The study seeks to find out the perceived influence of the use of Internet-enabled mobile devices on the academic performance of undergraduate students, in Federal University of Technology (FUT), Minna, Niger State, Nigeria.

Statement of the Problem

The advent of ICT has brought about some significant changes in every aspect of human life including education, agriculture, mining, health, information and economy. These changes have been facilitated through the use of Internet mobile devices. These devices are supposed to be used mostly for academic purposes. According to Iqbal and Bhatti (2020), smartphones can be effectively used for off- campus learning, communication with fellow students as well as for academic and non- academic purposes such as entertainment, social networking and collecting and sharing information. The undergraduate students in FUT, Minna have also taken advantage of this trend of using the Internet-enabled mobile devices in browsing the Internet as this has contributed greatly to their academic activities.

However, it has been observed that most of the undergraduate students of this institution have tremendously abuse the use of this devices as some are tempted to always interact with their mobile phones during lecture hours in the classroom, either by engaging in social media chat or by browsing the Internet for reasons other than what is being taught in class. This, no doubt, has reduced the level of attention paid to lectures. Even while lectures are over, most of them in their respective hostels and lodges, spend much time using their Internet-enabled mobile devices to engage in non-academic activities such as playing games watching movies, and chatting on social platforms like _WhatsApp, Facebook-Messenger, Instagram, Instant Messaging, Snapchat, Twitter_ and others. Consequently, the time they ought to have utilize to engage in studying and other significant academic activities are been taken away by the improper use of this mobile device and thus, this has negatively affected their academic activities (Abbass, Aashiq, Hassan & Alam, 2020)

With this situation of undergraduate students' use of mobile devices without due regard to academic activities, this study is therefore set to investigate the types, effects of use and challenges in the used of Internet-enabled mobile devices on the academic activities of undergraduate students in FUT, Minna.

Objectives of the Study

This study is aimed at investigating the perceived influence of Internet enabled mobile devices on the academic activities of undergraduate students in FUT Minna, Nigeria. However, the specific objectives are to:

1. identify various types of Internet-enabled mobile devices used by the undergraduate students in FUT, Minna;
2. examine undergraduate students' perceptions on the ease of use of Internet-enabled mobile devices to support their academic activities;
3. establish the effects associated with the used of Internet-enabled mobile devices on undergraduate students' academic activities in FUT, Minna; and
4. identify challenges in the use of Internet-enabled mobile devices by undergraduate students in FUT, Minna.

Research Questions

The following questions guided the study:

1. What are the various types of Internet-enabled mobile devices used by the undergraduate students in FUT, Minna?
2. What are the undergraduate students' perceptions on the ease of use of Internet-enabled mobile devices to support their academic activities?
3. What are the effects associated with Internet-enabled mobile device use on the undergraduate students' academic activities in FUT, Minna?
4. What are the challenges in the use of Internet-enabled mobile devices by undergraduate students in FUT, Minna?
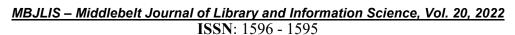
Review of Related Literature

The use of ICTs has penetrated all spheres of human life including the use of mobile devices. These ICT facilities has gain popularity in this 21st century (information age) where students, teachers, lecturers as well as scholars and researchers access information at the tip of their fingers. There are several write-ups on mobile devices as well as mobile technologies such that each writer explains or describes the concepts associated with mobile devices or technologies on the basis of their perception. Few of the empirical related literature are hereby reviewed. In an examination of various ICT tools and media platforms used in enhancing knowledge sharing among LIS educators in Federal University Lafia, Nasarawa State, Nigeria; Omame, Gombe, Alex -Nmecha and Gomna (2020) adopted descriptive survey research design. Total enumeration of eight (8) LIS educators was used for the study because of small and manageable population. It was discovered that laptops and desktop computers, smartphones, projectors, flash drives, hard disk, CD/DVD ROM were highly utilized by LIS educators.

Abbas, Aashiq, Hassan and Alam (2020) conducted a study to determine the advantages and disadvantages of using smartphones among social work students at the university of the Punjab, Lahore. The study adopted quantitative methodology. The population consist of 203 social work students having smartphones. Structured questionnaire was used to collect data from 203 social work students. Findings revealed that the benefit of using smartphones is mainly to communicate family and friends and the side effect of using smartphones is their distraction in classroom.

Iqbal and Bhatti (2020) conducted a study to the determine teachers' perception on the use of smartphones in higher education context in developing countries with special emphasis on universities of Islamabad, Pakistan. The study adopted qualitative method with the target population of 130 full time faculty members in university of Islamabad, Pakistan. Purposive sampling technique was used to select full time 22 faculty members in private sector university in Islamabad, Pakistan. In-depth interview was conducted for the selected full time faculty members. Semi-structured interviewed via phone and email was conducted mostly in English with few in Urdu language between the month of March and April, 2019. Findings revealed from respondents that smartphones are used on daily basis for communication, social networking, entertainment, collecting and sharing information as well as using them for educational purposes. Respondents express fears on the use of smartphones as it serves as source of distraction, waste of time, technostress, emotional detachment. Major obstacles to the adoption of smartphones in higher learning include lack of training and support, technical knowledge, incentives for using technology education.

In very specific qualitative research conducted through interview by Salihu (2021) to determine the preparedness of library staff of Bayero University Kano, Nigeria, in applying mobile technology in service delivery, the study review that respondents agreed with the impact and relevance of applying mobile technology to service delivery. Lack of committed and skilled manpower in University Library has well as high tariff charges and data subscription were are the challenges associated with the use of mobile technology in the information service delivery in Bayero University Kano library.

Aliyu, Saka and Udoudoh (2021) investigated the level of awareness, perception on use and readiness of university libraries and librarians on the use of smart phones technologies for information service delivery in universities in North west Nigeria. The study was guided by three specific objectives, while descriptive survey design was

used with the target population of 504 librarians in universities in North West Nigeria. Multistage sampling procedure was used and purposive sampling technique to involve 226 respondents in 11 universities. However, 226 copies of questionnaire were administered. Mean, percentage, mean score and standard deviation were used to analyze the data collected with the results showing high level of awareness and that the use of smart phones will improve librarians' work.

Methodology

Survey research design was used for this study as it involves several schools/ faculties and departments in FUT, Minna, Nigeria and hence the study involves the use of sample drawn from population thereby designing questionnaire to elicit responses from undergraduate students being the target audience. The target population of the study comprises 21,617 undergraduate students in nine (9) schools in FUT, Minna as at 2019/2020 academic session. Table 1 showed the population distribution.

Table 1: Population and Sample of the Study

S/N	School	Population (A)	Sample Size (B)
1	School of Agriculture and Agricultural Technology (SAAT)	2975	24
2	School of Electrical Engineering and Technology (SEET)	1810	24
3	School of Entrepreneurship and Management Technology (SEMT)	496	08
4	School of Environmental Technology (SET)	3804	24
5	School of Information and Communication Technology (SICT)	1096	24
6	School of Infrastructure, Process Engineering and Technology (SIPET)	3039	24
7	School of Life Science (SLS)	2205	24
8	School of Physical Science (SPS)	4293	24
9	School of Science and Technology Education (SSTE)	1899	24
	TOTAL	**21,617**	**200**

Source: Academic Office, FUT Minna (June, 2021)

The researchers randomly selected 200 undergraduate students from nine (9) schools within FUT, Minna. With exception of SEMT with lesser population that randomly selected eight (8) students, all other eight (8) schools were randomly selected with 24 undergraduate students from each per school. The reason for this choice of sample technique was that students are typically busy people with limited time. It may be difficult for them to create out time from their tight schedules to complete questionnaires all at once, therefore basic random sampling, which is known to have significant flaws, is used. Secondly, since the only place to get most of the student's attention was in the classroom the researchers decided to visit each class to select few people. At the end, 200 undergraduate students were finally selected for the study with

24 from each school while SEMT with the lesser population has eight selected undergraduate students.

Structured/closed-ended questionnaire was designed and employed as the data collection tool for this research was distributed in a total of 200 copies on 200 undergraduate students by the researchers. The questionnaire contained two sections; Section A which contained level of undergraduate program of the respondents, while Section B contained well-structured questions based on the four research questions raised for the study.

To validate the instrument, lecturers from Department of Library and Information Technology, FUT, Minna were given the draft copies of structured questionnaire to evaluate after which the modified versions were corrected and then administered to the respondents to seek their opinion regarding items on the questionnaire. The data were collected through the use of the questionnaires that were filled by the students. Descriptive statistical tools such as frequency counts/tables and percentages were used as the appropriate descriptive statistical tool for the analysis of the data. Tables and figures were used to present the results of the data in order to provide comprehensive understanding of the data and also show relationship between data.

Response Rate

A total of 200 copies of the questionnaire were administered to the respondents, out of the 200 copies, 156(78.0%) copies were filled and returned in usable form.

Section A: Level of Undergraduate Programme of Respondents

Analysis and Results

Table 2: Respondents' Level of Undergraduate Programme

Level	Frequency	Percentage (%)
100	11	7
200	49	31
300	43	28
400	4	3
500	49	31
Total	**156**	**100**

Table 2 revealed respondents by level of undergraduate program in the university. It showed that 200 and 500 level students used mobile phone more. The reason to be advanced for this is that 200 level students in all the departments in the university usually commence their full program at 200 level and hence at 100 level they offer General Study (GST) courses as well as general program. As of 500 level students, apart from the fact that they are in their final year, they are also busy engaging in project writing.
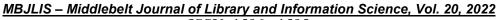
RQ 1: What are the various types of Internet-enabled mobile devices used by the undergraduate students in FUT, Minna?

Table 3: Types of Internet-enabled Mobile Devices used by the Respondents

Types	Frequency	Percentage (%)
Techno	62	40
Infinix	45	29
iPhone	11	7
Samsung	10	6
Itel	9	6
Nokia	4	3
Tablet	1	.64
Redmi	3	2
Others	12	8
I don't have Internet mobile phone	0	
Total	**157**	**100**

Although the response rate showed 156 respondents but the frequency on Table 3 showed 157 signifying that a respondent is likely to tick more than one type of mobile device. Table 3 shows the type of the devices used by students according to their distribution. Data showed that 39.79% of the students are use Tecno phone, 28.85% use Infinix, 7.05% use iPhone, 6.41% use Samsung, 5.77% use Itel, 2.56% use Nokia, 0.64 use Tablet, 1.92 use Redmi, while 7.69 of the respondents use other Internet enabled mobile phones such as Gionee, and Huwai. Tecno smartphones have the highest users because it is more popular and easily affordable while Tablets have the lowest users because it is not portable to be carried about on campus.

RQ 2: What are the students' perceptions on the ease of use of Internet-enabled mobile devices to support their academic activities?

Table 4: Respondents' Perception on Ease of Use of Internet Mobile Phones in Learning

S/N	Item statements	SA	A	D	SD	Total
1	Easy using Internet mobile phone for learning	93(59.6%)	59(37.8%)	2(1.3%)	2(1.3%)	156(100)
2	Require any additional skills to use Internet mobile phone	22(14.1%)	49(31.4%)	57(36.5%)	28(17.9%)	156(100)
3	Easy using Internet mobile phone to access course materials	88(56.4%)	58(37.2%)	9(5.8%)	1(0.64%)	156(100)
4	The interface of Internet mobile phone is user friendly	84(53.8%)	64(41.0%)	7(4.5%)	1(0.64%)	156(100)
5	I interact with Internet mobile phone without any difficulties	97(62.2%)	51(32.7%)	8(5.1%)	0(0)	156(100)
6	Encounter technical problem when using Internet mobile phone for learning.	21(13.5%)	37(23.7%)	68(43.6%)	30(19.2%)	156(100)
7	Perceived it to be useful academically	108(69.2%)	44(28.2%)	4(2.6%)	0(0)	156(100)
	Total	**513**	**362**	**155**	**62**	**1092**
	Percentage (%)	**47.0%**	**33.2%**	**14.2%**	**5.7%**	**100%**

The result from Table 4 shows that 108(69.2%) of the respondents indicated that they perceived Internet-enabled mobile devices to be useful academically. This is because of the unique features embedded into these devices such as the ability to browse the Internet to access information, download and read course materials, engage in group conversations etc. The data showed that only 1(0.64%) of the respondent Strongly disagree that the interface of these devices are user-friendly, this could be due to the complex nature of the user-interface of most of these devices, thereby making it difficult to interact with it.

RQ 3: What are the effects associated with Internet-enabled mobile device use on the undergraduate student's academic performance in FUT, Minna?

Table 5: Effects of Internet Mobile Phone Use on Respondents' Academic Performance

S/N	Statements	SA	A	D	SD	Total
1	Internet mobile phone improve my academic performance	69(44.2%)	74(47.4%)	11(7.1%)	2(1.3%)	156(100)
2	It support private learning	87(55.8%)	64(41.0%)	3(1.9%)	2(1.3%)	156(100)
3	Internet mobile phone makes me not to pay much attention during my studies	15(9.6%)	44(28.2%)	64(41.0%)	33(21.1%)	156(100)
4	Spent much time on entertainment rather than education with Internet mobile device	25(16.0%)	43(27.6%)	57(36.5%)	31(19.9%)	156(100)
5	It helps to broadened knowledge	83(53.2%)	62(39.7%)	9(5.8%)	1(0.6%)	156(100)
6	It distract in the class and causes low academic performance	18(11.5%)	39(25.0%)	53(34.0%)	46(29.5%)	156(100)
7	I read ahead of lecture with my Internet mobile device	40(25.6%)	76(48.7%)	34(21.8%)	6(3.8%)	156(100)
	Total	**337**	**402**	**231**	**121**	**1092**
	Percentage (%)	**30.9%**	**36.8%**	**21.2%**	**11.1%**	**100%**

Table 5 shows that 87(55.8%) of the respondents indicated Strongly Agree to Internet-enabled mobile devices supporting private learning. This is because with these devices, one can learn at his/her own conveniences and also engage in private video tutorial online to acquire more knowledge. The data also showed that only 1(0.64%) of them strongly disagree that these devices can be used to broadened knowledge. This is because they felt that these devices are distractions to them due to the fact that they engage more on the entertainments features rather than the academic aspect of it.

RQ 4: What are the challenges to the use of Internet-enabled mobile devices by undergraduate students in FUT, Minna?

Table 6: Challenges to the Use of Internet-enabled Mobile Devices

S/N	Statements	SA	A	D	SD	Total
1	Cannot afford it	16(10.3%)	41(26.3%)	76(48.7%)	23(14.7%)	156(100)
2	Unstable power supply	55(35.3%)	80(51.3%)	11(7.1%)	10(6.4%)	156(100)
3	Instability of network service	62(39.7%)	74(47.4%)	16(10.3%)	4(2.6%)	156(100)
4	High cost of data	71(45.5%)	64(41.0%)	16(10.3%)	5(3.2%)	156(100)
5	Sleepless night and fatigue	21(13.5%)	51(32.7%)	66(42.3%)	18(11.5%)	156(100)
6	Hearing or sight problem	11(7.1%)	33(21.2%)	71(45.5%)	41(26.3%)	156(100)
7	Difficult to operate	7(4.5%)	8(5.1%)	76(48.7%)	65(41.7%)	156(100)
	Total	**243**	**351**	**332**	**166**	**1092**
	Percentage (%)	**22.3%**	**32.1%**	**30.4%**	**15.2%**	**100%**

The result from Table 6 shows that 80(51.3%) of the respondents Agree that unstable power supply was the major challenges to the use of Internet-enabled mobile devices. This is because the batteries of most of these devices don't serve for a long time and as a result of this, they will need a constant power supply to charge the batteries of their devices whenever it runs down, but unfortunately power supply is unstable. The lowest data 4(2.6%) revealed strongly disagree on the instability of network service as a challenge to the use of these devices. This is because they believe that network service is always available for them to use.

Discussion of the Findings

On the issue concerning the type of Internet-enabled mobile devices possessed by the undergraduate students of FUT, Minna, the findings showed that majority of the respondents used Tecno and Infinix while iPhone, Itel, Samsung and other kinds of Internet-enabled mobile phones such as Gionee, Huawei and Oppo also have significant number of users. Only a few respondents have Nokia, Tablets and Redmi. Therefore, the findings corroborate that of Aliyu, Saka and Udoudoh (2021) but contradict that of Omame, Gombe, Alex-Nmecha and Gomna (2020) respectively. Aliyu, Saka and Udoudoh (2021) reported the availability of different kind of well-known systems of smart phones which include: Android, iOS (iphone Operating System) and Windows Phone. Omame, Gombe, Alex-Nmecha and Gomna (2020) reported the availability of laptops and desktop computers, smartphones, projectors, flash drive, hard disk as well as CD/DVD ROM and were highly utilized by LIS educators in university - based library school

The findings of the study on undergraduate students' perception on the ease of use of Internet mobile phones in learning activities showed that majority of the students finds it easy to use them for learning and has positively influenced their academic

performance. This finding support that of Iqbal and Bhatti (2020) and Salihu (2021) but contradict the finding of Abbas, Aashiq, Hassan and Alam (2020), respectively. Iqbal and Bhatti (2020) reported smartphones usage to enhance off-campus learning, communication and for general educational purposes. Salihu (2021) reported that library staff agree with the impact and relevance of applying mobile technology to service delivery in university library. Abbas, Aashiq, Hassan and Alam (2020) reported the advantages and disadvantages of using smartphones by students and thus they are use in communicating family and friends at the same time they distract classroom teaching and learning among students of social work department at university of the Punjab, Lahore.

The findings on the effect of Internet-enabled mobile devices use on the academic activities of the undergraduate students reveals that majority of respondents agreed that Internet-enabled mobile devices support their private learning and this finding is contrary to part of findings by Iqbal and Bhatti (2020) as well as Salihu (2021), respectively. The former co-researchers in 2020 revealed part of findings as fear created in using smartphones to include source of the distraction, wastage of time, technostress; while major obstacles to the adoption of smartphones in higher learning include lack of training and support, technical knowledge and incentives for using technology in education. Salihu (2021) reported high tariff charges, lack of committed and competent staff among others as problems to application of mobile technology in information service delivery in library of Bayero University, Kano.

Findings of the study on the challenges in the use of Internet-enabled mobile device for academic performance showed that majority of the respondents agreed that the high cost of these devices is a factor that is limiting them from purchasing it. In providing answer to research question four, it was discovered that unstable power supply and network service as well as high cost of data were the most serious problems to undergraduate students on the use of Internet – enabled mobile devices in the university. This finding contradicts the findings of Abbas, Aashiq, Hassan and Alam (2020) and Salihu (2021), respectively. Abbas *et. al.* (2020) reported the use of smartphones by students in communicating friends and family and causes distraction in classroom; while Salihu (2021) reported lack of committed and skilled manpower and high tariff charges/data subscription as the most serious challenges to the use of mobile technology in the information delivery in university library.

Conclusion

Arising from the result presented and its discussion, this study concludes that Internet-enabled mobile phones usage by the undergraduate students in FUT, Minna enhanced the students' academic activities if well utilized, but if not properly utilized can cause harm to their academics. The proper use of these devices by the students has led to the enhancement and improvement of knowledge acquisition by some of the under graduate students thereby increasing their academic activities and vice versa.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. There should be collaboration between University management and manufacturers of mobile devices/phones to advice the university on the type of phones to be used

by undergraduate students for their academic activities. Alternatively, University management can liaise with manufacturers of mobile phones to manufacture specific mobile phones for the use of academic activities only.

2. Undergraduate students should be encouraged to use mobile phones on specific academic activities such as: assignment, term paper, research, practical class, seminar/paper presentation as well as virtual conference presentation.

3. Management of FUT, Minna should encourage undergraduate students on collaborative learning through the use of mobile phones. Undergraduate students should be encouraged to organize group learning, online learning as well as formation of social media platform.

4. The management of FUT, Minna should provide alternative sources of power supply such as solar, inverter as well as stand-by- generating plant to solve the problem of power failure. Subscription to data should be given priority, while students be charged less in the course of using university ICT facilities.

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AUTHORS' PROFILES

Dr Katamba Abubakar Saka obtained NCE, BLIS, MLS and Ph.D. Library and Information Science. He joined Federal University of Technology, Minna as an Assistant Lecturer in August, 2005 and rose through the ranks to become Associate Professor in 2019 in the Department of Library and Information Technology. Dr. Saka who held several positions of authority in the University was Head of Department (2015-2020). He has supervised both undergraduate and Postgraduate (Master and Ph.D.) research works. He was appointed a substantive University Librarian in March, 2021. A member of the NLA, NALISE and AULNU. Also, certified member of the Librarians' Registration Council of Nigeria (LRCN). He is visible at local, national and international conferences and workshops; widely published in both refereed and professional journals, proceedings, book chapters and a textbook. His area of specialization is Library Management. Dr. Saka can be reached at: s.katamba@futminna.edu.ng.

Kelechi Ekwuluonu obtained his first school leaving certificate at Our Lady's Nursery and Primary School, Suleja, Niger State. He completed his Secondary School in 2013 in Taraba State and got admitted into Federal University of Technology Minna, Niger State in 2015 to study Library and Information Technology, where he was awarded Certificate of Excellence for Outstanding Performance in 2019/2020 academic session. He also bagged a First Class Honor degree. After his NYSC in Ekiti State, he finally chose to pursue his career goal in the field of ICT as a software developer. He has built three software as a personal project such as Ecommerce, Blog and Customer Relation Management Apps.