LAFIA JOURNAL OF LIBRARY AND INFORMATION SCIENCE
Volume 4, Number 1, 2023.
Available online ***https://journals.fulafia.edu.ng/index.php/ljlis***
ISSN:Print - 2814-0702, Online - 2814-0710
LJLIS

INFLUENCE OF INFORMATION AND COMMUNICATION TECHNOLOGY ON POSTGRADUATE STUDENTS' RESEARCH ACTIVITIES IN FEDERAL UNIVERSITY LIBRARIES IN NORTH-CENTRAL, NIGERIA

Yisadoko, Samuel
Library Department, Federal Polytechnic, Bida, Niger State

Aji, Kingsley Olawale
College Library, FCT College of Education, Zuba, Abuja

Martins Dodo
Nigerian Law School, Lagos Campus

Abstract
The study investigates the influence of Information and Communication Technology (ICT) on Post Graduate students' research activities in five selected Federal University Libraries in North Central, Nigeria. Objectives of the study were to find out the research activities of postgraduates' student, availability of ICT facilities, influence of ICT on research activities and challenges in the utilisation of ICT facilities. Four research questions were formulated to guide the study. Two null hypotheses were tested at 0.05 level of significance. Descriptive survey design was employed for the study and sample size of 311 was drawn out of 6,855 postgraduate students, five (5) Heads of ICT unit in the university libraries were used, stratified proportionate sampling technique was used to select sample according to pragrammes (Masters and Ph.D.) and Simple random sampling technique was employed to select the representative sample from each stratum. The instruments used for data collection were structured questionnaire and observation checklist. A total of 311 copies of questionnaire were distributed to the respondents out of which 287 copies were dully filled and returned representing 93% response rate. Descriptive statistics was used to analyse the data, inferential statistics (Pearson Product Moment Correlation Coefficient) was used to test the hypotheses at probability of 0.05. The findings revealed that ICT facilities are available for research at different levels in the federal university libraries under study. It also shows that ICT facilities influence research activities in finding and communicating information quickly and easily. The study identifies insufficient ICT facilities, irregular power supply, and poor Internet

connectivity as the challenges for effective utilisation of ICT facilities for research. The study recommends provision of sufficient computers with Internet connectivity, improvement in ICT infrastructure in university libraries, provision of adequate electricity with alternative sources of power.
Keywords: *University library, research, postgraduate research, ICT, Nigeria.*

Introduction

Universities are part of the institutions responsible of growth and development of a nation through the important role they play in the social, economic, technological and manpower development. Universities are able to contribute to the development of their immediate communities and the world at large through research that leads to advancement in knowledge in different areas of human existence. One of the basic goals of a university is to provide enabling environment for the conduct of research and dissemination of knowledge for societal development.

The research quality of any university is measured by the excellence of its library facilities as the libraries are established in the university system to provide high quality information services to support teaching, learning and research objectives of the university. The extent to which university is able to achieve these credible objectives demonstrates how the library has been supportive in the provision of essential information resource (Adio & Popoola, 2010). The University library, which is usually referred to as the nerve centre of the university is primarily set up for the achievement of the university's set goals and objectives by providing information materials and services which meet the information needs of the entire university community.

Research is the bedrock of national development. Nwagwu (2010) viewed research as a procedure that facilitates the contribution of knowledge by scientists towards finding solutions to societal and human problems. Basically, the result of research is the discovery of new knowledge, which is used in societal development and betterment of human existence. The goal of research is to improve the advancement of societal/human knowledge, and this role is primarily the responsibilities of the universities (Okafor, 2011). Research is the most important component of postgraduate studies, as it enables them to systematically investigate societal problems, provide solutions to them and contribute to knowledge.

Postgraduate research is a mechanism by which graduate students learn how to undertake a systematic investigation based on work done by peers in the field, and then to extend or add to the current state of knowledge. Most of the time, it is actually an apprenticeship for mastering systematic research processes

(Postgraduate Research, 2009). Postgraduate students' research activities involve thesis writing and publications in journals, conferences and seminars. In undertaking these activities, they have to filter information from different sources such as the internet, electronic resources, libraries, media and other sources (ACRL, 2016). Thus, use of ICT in the library has become necessary for their research activities as it provide quicker and easier access to wide-range and current information.

In response to the university's need to improve its research activities, the university library has adopted the use of Information and Communication Technology (ICT) and this has drastically transformed information service delivery in the university libraries. The introduction of ICT in the Nigerian university libraries have completely changed now as a result of the roles they play in fulfilling the frequently changing needs of information in order to remain relevant in this 21st Century. ICT have totally improved provision of library and information services by overcoming time, distance and other barriers. The application of ICT in the library has to a great extent enhanced accuracy and efficiency in information handling and delivery, it has greatly improved the way information is being controlled and managed in libraries. Eyo and Ebaye (2009) affirmed that those libraries that operate with the application of ICT not only have the best of the information in the world, but they also stand a better chance of meeting up with the huge demand of information by the users.

Information and Communication Technology is increasingly becoming more prevalent throughout university education worldwide, which is in line with UNESCO's policy paper for change and development in higher education, which urges higher education institutions to make greater use of the advantages offered by the development of ICT to improve the provision and quality of their education (Bonk, Lee & Reynolds, 2009). In other words, ICT is a very important tool for research in the university system and it has the potential to enrich and accelerate skills, motivate and engage students in research; contributes to fundamental changes in school, supports and provides opportunities for connection between the school and the world (Adelabu & Adu, 2014). ICT therefore, can be used by postgraduate students in the university libraries to carry out research activities as it provides them with a steady opportunity for accessing information and dissemination of research reports and findings ICT, without doubt, have the capacity of promoting research activities, increasing the speed of searching for documents, and facilitate transfer of information (Tyonum & Shidi, 2014). The use of ICT facilities meet postgraduates' research needs, by helping them to access and retrieve information for their research activities and broaden their general

knowledge. From the foregoing, this study therefore intends to examine the influence of ICT on research activities of postgraduate students in the federal university libraries in North Central, Nigeria.

Review of Related Literature

Hardly can any scholar or researcher successfully complete a project without utilising ICT. Study carried out by Bugyei, Obiri-Yeboah and Kavi (2017) revealed that ICTs utilisation has a positive influence on research activities. It further shows that ICT tools have been proven to be very helpful to researchers in finding needed information quickly and easily, expedition in the research process and have also helped in information access, management and communication. The study also identified lack of training in ICT, insufficient computer hardware and suitable software applications, lack of competent Information Technology (IT) professionals, non-existent budgetary allocations for ICT and lack of required Internet bandwidth as the major hindrances faced by the researchers.

Students at the level of postgraduate ought to be conversant with ICT as a tool for academic research, but the case may not always be so. Abubakar and **Adetimirin (2015)** *revealed that the postgraduates' computer literacy level was average and they use only few of the e-resources in their libraries and the frequency of usage was low. Their low skilled level can hinder or limit their ability to meet datelines for their projects, conduct research and contribute meaningfully in their areas of endeavour.*

A study carried out by Ukanu (2008) revealed that Nigerian university libraries used ICT facilities for the provision of library and information services, and that there is no significant difference between Southern and Northern university libraries in their utilisation of ICT facilities with respect to location. The researcher recommended the following approaches in order to ensure effective use of ICT facilities: ICT facilities on Installation and Monitoring Committee (IMC) should be set up in Nigerian university libraries to include staff and users. Some of the responsibilities or functions of the committee should be to inspect installations, maintain and repair broken ICT facilities for effective utilisation. There should be appropriateness of the technology. That is, the ICT facilities installed should be suitable to the local and socio-cultural context of the library environment and, these facilities should be appropriate to the needs of the library.Despite the availability of ICT facilities in higher institution of learning, they are not without challenges which have been the bend of academic progress in Nigeria. Akporhonor and Akpojotor (2016) revealed in their study that poor Internet connectivity, irregular power supply, information overload, high cost of access, download delay and difficulty in accessing some websites are some of the problems militating against the use of electronic information resources by

postgraduate students of library and information science in Southern Nigeria. Many of the Nigerian's higher institutions of learning provide alternative power supply to enable them run their institution. Presently, there is an upsurge in the price of premium motor spirit (petrol) and diesel which are used in powering the power generators. This implies that the challenges are likely to be overcome soon.

Statement of the Problem

No doubt in this 21st century, the role of ICT in the provision of information resources in university libraries is very important to postgraduate students' research activities. ICT obviously has numerous advantages and benefits that are experienced in their utilisation for research. The availability of diverse ICT facilities such as computers, Internet, on-line databases, e-mail, software programme, among others are expected to further influence the conduct of postgraduate research work. Postgraduate students are expected to use these facilities to enable them obtain current and relevant information to support research and other scholarly activities.

However, from the preliminary investigation carried out in the ICT units of the university libraries in North Central Nigeria and available literature revealed that despite the enormous benefit provided by ICT facilities they were inadequately utilised by postgraduate students for research activities (Namenya, 2014).. It is in the light of the above that the researchers investigated the influence of ICT on research activities of postgraduate students in the federal university libraries in North-Central, Nigeria.Objectives of the study This study is to examine the influence of Information and Communication Technology (ICT) on research activities of postgraduate students in federal university libraries in North Central, Nigeria.

The specific objectives are to:

1. find out the kinds of research activities being carried out by Postgraduate students in federal universities in North Central, Nigeria
2. find out the ICT facilities available for postgraduate students' research in federal university libraries in North Central, Nigeria;
3. find out the influence ICT facilities on postgraduate students research activities in federal university libraries in North Central, Nigeria;
4. identify the challenges faced by postgraduate students in utilization of ICT facilities for research in federal university libraries in North Central, Nigeria and the way forward.

Hypotheses

The following null hypotheses were formulated at 0.5 level of significance in pursuance of the study:

Ho_1 There is no significant relationship between availability of ICT facilities and postgraduate research in federal university libraries in North Central Nigeria.

Ho_2 There is no significant relationship between ICT utilization and postgraduate research in federal university libraries in North Central Nigeria.

Research Methodology

The descriptive survey research design was used for this study. A sample size of 311 was drawn from 6,855 postgraduate students and five heads of ICT unit of the federal universities under study were selected. Stratified proportionate sampling technique was used to select sample, this involves grouping the subjects of the study (postgraduate students) according to the programmes (Masters, Ph.D.) respectively, and Simple random sampling technique was employed to select the representative sample from each stratum.

The major instruments used for collecting data for this study were observation checklist and structured questionnaire. Descriptive statistics was used to analyse the research questions and inferential statistics Pearson Product Moment Correlation Coefficient (PPMC) was used to test the hypotheses.

Data Analysis

General information about the sample size of 311 was drawn from postgraduate students and five heads of ICT unit of the federal universities under study were selected. From the sample size, 287 copies were dully filled and returned representing 93% response rate.

Table 1: Federal universities selected for the study

Names of selected universities and faculty/school	Sample			Percentage (%)
	Masters	Ph. D.	Total	
Faculty of Social sciences, University of Jos, Jos	103	16	119	38
Faculty of Communication and Information Sciences, University of Ilorin, Ilorin	62	12	74	24
Faculty of Management Sciences University of Abuja,	51	5	56	18
School of Life Sciences, Federal University of Technology Minna	27	6	33	11
College of Agronomy, University of Agriculture, Makurdi	25	4	29	9
Sum Total	268	43	311	100

Table 1 the sample size of 311 postgraduates and five heads of ICT and their respond rates.

Table 2: Status response rate

Status	Frequency	Percentage (%)
Masters	254	89
PhD.	33	11
Total	287	100

Table 2 shows that 254 (89%) were master's students while 33 (11%) were Ph.D. students. This implies general reflection of postgraduate studentship; where there are lesser students at the PhD. level than at the Masters level students in federal universities in North Central, Nigeria

Kinds of research activities being carried out by postgraduate students in federal universities in North Central, Nigeria

Table 3: Kinds of research activities carried out.

S/NO	Kinds of research activities	Masters		PhD.	
		Yes	No	Yes	No
1	Term paper	245(96%)	9(4%)	-	-
2	Seminar paper	247(97%)	7(3%)	29(88%)	4(12%)
3	Conference paper	253(99.6%)	1(0.4%)	-	-
4	Articles in journal	-	-	33(100%)	-
5	Thesis/Dissertation	254(100%)	-	33(100%)	-

Table 3 shows yes or no ratings of the respondents on the kinds of research activities carried out by postgraduate students in the federal universities. The results shows that thesis with (100%), conference paper with (99.6%), seminar paper with (97%) and term paper with (96%) are the main research activities carried out by master's students while Dissertation and articles in journal with (100%) and seminar with (88%) are the main research activities carried out by Ph.D. students in the federal universities in North Central Nigeria. This implies that postgraduate student carry out research activities and this varied according to the programme of study.

Types of ICT facilities are available for postgraduates' student in the federal university libraries under study

Table 4: Observation checklist result on ICT facilities available in federal university libraries in North Central Nigeria.

S/N	ICT FACILITIES	Unijos		Unilorin		Uniabuja		Futmx		Uniagric	
		A	NA	A	NA	A	NA	A	NA	A	NA
1	Desktop computers	√		√		√		√		√	
2	Laptop	√		√		√		√		√	
3	Printer	√		√		√		√		√	
4	Photocopying Machine	√		√		√		√		√	
5	Scanners	√		√		√		√		√	
6	Local Area Network (LAN)	√		√		√		√		√	
7	Internet Network/Facilities	√		√		√		√		√	
8	E-mail facilities	√		√		√		√		√	
9	World Wide Web (WWW)	√		√		√		√		√	
10	Bibliographic Online Database	√		√		√		√		√	
11	Full-text Online Database	√		√		√		√		√	
Total		11		11	-	11		11		10	

Keys: A= Available, NA= Not Available

Observation checklist in Table 4 was arranged according to the number of ICT facilities available in federal university libraries in North Central Nigeria. The result revealed all 11 ICT facilities listed are available in all the University libraries. This implies that ICT facilities are available in the university libraries

Influence of ICT facilities on postgraduate student research activities

		MASTERS						Ph.D.					
S/N	influence ICT facilities on postgraduate Research activities	VGE	GE	LE	VLE	Mean ??	STD ??	VGE	GE	LE	VLE	Mean ??	STD ??
1	Quick access to information resources	47(18.5%)	207(81.5%)	-	-	3.2	.389	2(6.1%)	31(93.9%)	-	-	3.1	.242
2	Breaking barrier of distance to information	6(2.4%)	237(93.3%)	11(4.3%)	-	3.0	.259	33(100)	-	-	-	4.0	.000
3	Facilitates communication of research information	82(32.3%)	154(60.6%)	18(7.1%)	-	3.3	.576	27(81.8)	6(18.2)	-	-	3.8	.392
4	Research collaboration among researchers from different location	15(5.9%)	219(86.2%)	20(7.9%)	-	3.0	.371	27(81.8)	6(18.2)	-	-	3.8	.392
5	Saves time in literature search	65(25.6%)	188(74.0%)	1(.4%)		3.3	.444	-	30(90.9%)	3(9.1%)	-	2.9	.292
6	Access to academic Resources	28(11.0%)	206(81.1%)	20(7.9%)	-	3.0	.434	7(21.2%)	26(78.8%)	-	-	3.2	.415
7	Eliminates duplication of research works	13(5.1%)	207(81.5%)	19(7.5%)	15(5.9%)	2.9	.586	29(87.9)	-	4(12.1%)	-	3.8	.663
8	Conduct complex analysis on large data sets	4(1.6%)	240(94.5%)	6(2.4%)	4(1.6%)	3.0	.318	27(81.1)	3(9.1%)	-	3(9.1%)	3.6	.895
	Total					3.1	.422					3.5	.362

Table 5: influence of ICT facilities on postgraduate's students research activities.

The result in Table 5 shows that ICT facilities influences masters students' for research activities to a great extent in all the eight (8) items listed with item 4 having a mean score of ($\bar{X}$=3.3;$\bar{u}$=.576), item 1 with ($\bar{X}$=3.2;$\bar{u}$=.389), item 6,4,8 and 2 with ($\bar{X}$=3.0;$\bar{u}$=.434, $\bar{X}$=3.0;$\bar{u}$=.371, $\bar{X}$=3.0;$\bar{u}$=.318, $\bar{X}$=3.0;$\bar{u}$=.259) respectively, item 7 with ($\bar{X}$=2.9;$\bar{u}$=.586).

ICT facilities influences Ph.D. students' research activities to a very great extent in breaking barrier of distance to information ($\bar{X}$=4.0;$\bar{u}$=.000), eliminates duplication of research works with ($\bar{X}$=3.8;$\bar{u}$=.663), research collaboration among researchers from different location with ($\bar{X}$=3.8;$\bar{u}$=.392), facilitates communication of research information with ($\bar{X}$=3.8;$\bar{u}$=.392), conduct complex analysis on large data sets with ($\bar{X}$=3.6;$\bar{u}$=.895) while to a great extent PhD students' utilize ICT facilities for research activities in the areas of access to academic resources with ($\bar{X}$=3.2;$\bar{u}$=.415), quick access to information resources ($\bar{X}$=3.1;$\bar{u}$=.242, saves time in literature search with ($\bar{X}$=2.9;$\bar{u}$=.292). This implies that ICT facilities have positive influence on postgraduate students' research activities.

The challenges of utilisation ICT facilities for research by postgraduate students

Table 6: Challenges of utilisation of ICT facilities for research

		MASTERS						Ph.D.					
S/N	Challenges in the use of ICT	SA	A	D	SD	Mean ($\bar{X}$)	STD ($\bar{u}$)	SA	A	D	SD	Mean ($\bar{X}$)	STD ($\bar{u}$)
1	Insufficient computers with Internet facilities	242(95.3%)	9(3.5%)	3(1.2%)	-	3.9	.282	25(75.8%)	8(24.2%)	-	-	3.8	.435
2	Absence or poor Internet connectivity	59(23.2%)	193(76.0%)	2(0.8%)	-	3.2	.437	8(24.2%)	25(75.8%)	-	-	3.2	.435
3	Inadequate ICT infrastructures	56(22.0%)	182(71.7%)	16(6.3%)	-	3.2	.510	7(21.2%)	26(78.8%)	-	-	3.2	.415
4	Irregular power supply	197(77.6%)	51(20.1%)	6(2.4%)		3.8	.484	24(72.7%)	9(27.3%)	-	-	3.7	.452
5	Download delay	179(70.5%)	60(23.6%)	15(5.9%)	-	3.6	.590	20(60.6%)	13(39.4%)	-	-	3.6	.496
6	Lack of adequate ICT skills	68(26.8%)	178(70.1%)	8(3.1%)	-	3.2	.494	6(18.2%)	27(81.8%)	-	-	3.2	.392
	Total					3.5	.487					3.5	.442

The result in Table 6 shows that Master's students strongly agree with the challenges such as insufficient computers with Internet facilities with($\bar{X}$=3.9; $\bar{u}$=.282) and irregular power supply with ($\bar{X}$=3.8; $\bar{u}$=.484), download delay with ($\bar{X}$=3.6; $\bar{u}$= .590) as the major challenges for the effective utilisation of ICT facilities in federal university libraries, while they agreed that the rest of the challenges range from absence or poor Internet connectivity, lack adequate ICT skills inadequate, ICT infrastructure and lack of technical assistance by library staff with ($\bar{X}$=3.2;$\bar{u}$=.437),($\bar{X}$=3.2$\bar{u}$=.494), ($\bar{X}$=3.2;$\bar{u}$=.510)and ($\bar{X}$=3.2;$\bar{u}$=.613) respectively.

PhD students strongly agreed with the challenges such as insufficient computers with Internet facilities with ($\bar{X}$=3.8; $\bar{u}$=.435), irregular power supply with ($\bar{X}$=3.7; $\bar{u}$=.452), and download delay with ($\bar{X}$=3.6; $\bar{u}$= .496) as the major challenges for the effective utilisation of ICT facilities in federal university libraries, while they agreed that the rest of the challenges range from absence or poor Internet connectivity, Inadequate ICT infrastructure and lack of technical assistance by library staff, with ($\bar{X}$=3.2$\bar{u}$=.435), ($\bar{X}$=3.2;$\bar{u}$=.392), ($\bar{X}$=3.2;$\bar{u}$=.515) and ($\bar{X}$=3.0;$\bar{u}$=.467) respectively. This implies that postgraduate students face challenges in the effective utilization of ICT facilities for their research activities.

Hypotheses testing

Two hypotheses were tested in the study at 0.05 level of significance. The results of the test are as follows:

Table 7: There is no significant relationship between availability of ICT facilities and post graduate research activities in federal universities under study

Postgraduate level	Variables	Mean	STD	Pearson correlation (r)	Sig (P)	N
Masters	Availability of ICT facilities	1.780	0.415	0.602	0.000	254
	Research activities	1.771	0.418			
PhD	Availability of ICT facilities	1.79	0.415	0.424	0.000	33
	Research activities	1.8283	0.3825			

**. Correlation is significant at the 0.05 level (2-tailed).

Table 7 shows the correlation indexes for the relationship between availability of ICT facilities and kinds of research activities Masters and PhD are 0.602 and 0.424 at probability level of 0.05 respectively which falls between the ranges of (0.4-0.7) which indicate that there is a moderate positive relationship between availability of ICT facilities and kinds of research activities carried out by Master's and Ph.D. students. Hence the Null Hypothesis (H_{o1}) which **stated that**

there is no significant relationship between availability of ICT facilities and kind of research activities in federal universities in North Central Nigeria is rejected. This implies that there is significant relationship between availability of ICT facilities and kind of postgraduates' research activities.

Table 8: There is no significant relationship between extent of ICT utilisation and postgraduate research activities in Federal Universities under study

Postgraduate level	Variables	Mean	STD	Pearson correlation (r)	Sig (P)	N
Masters	Utilisation Research activities	2.73 1.77065	0.446 0.418	0.5560	0.000	254
PHD	Utilisation Research activities	2.76 1.8283	0.435 0.3826	0.4300	0.000	33

**. Correlation is significant at the 0.05 level (2-tailed).

Table 8 shows the correlation indexes for the relationship between ICT utilisation and kinds of research activities by Master's and Ph.D. are 0.5560 and 0.4300 at probability level of 0.05 respectively which falls between the ranges of (0.4-0.7) which indicates that there is a moderate positive relationship between ICT utilisation and kinds of research activities carried out by Master's and Ph.D students. Hence the Null Hypothesis ($H_{o2)}$ **which stated that** there is no significant relationship between utilisation ICT facilities and kind of research activities in federal universities in North Central Nigeria is rejected. This implies that there is significant relationship between utilisation of ICT facilities and kind of postgraduates' research activities.

Discussion of Findings

Findings of the study revealed that Thesis/Dissertation, articles in journal, seminar papers, conference papers and term papers are the common research activities carried out by postgraduate student in federal universities in North Central Nigeria. The masters' students mainly carry out research in writing of conference papers, seminar papers, term papers and thesis, while the Ph.D. student carried out research majorly in writing of articles in journal, seminar papers and dissertations. This is in agreement with the findings of Abubakar and Adetimirin (2015) who listed out the kind of research activities carried out by postgraduate student to include writing of seminar papers and information for

term papers, theses/dissertations and other research activities. It was discovered that the type of research activities carried out varied according to the programme of study.

The study found out that majority of ICT facilities is available in the federal university libraries under study. The available ICT facilities includes Desktop computers, Laptops, Printers, Scanners, Local Area Network (LAN), Internet Network/Facilities, E-mail facilities, World Wide Web (WWW), Operating system, Application packages, Web browser, Bibliographic Online Database, Full-text Online Database. The findings of the study is in line with the work of Nwezeh (2010), which outlined some of the ICT facilities that are available and used for scholarly work in Nigeria universities to include computer operating systems, software packages, Internet and e-mail services.

Findings revealed that ICT utilisation influenced postgraduate student research activities in area of quick access to information resources, breaking barrier of distance to information, facilitating communication of research information, saves time in literature search, research collaboration among researchers from different location, access to academic resources , eliminate duplication of research work, and conduct complex analysis on large data set. This is in line with the study of Mosuro (2000) who affirmed that the role ICT plays includes provision of unrestricted access to research information/data; reduction in travelling from one place to another in search of information; facilitating the communication of research information; allowing research collaboration among researchers in different locations; and saves the time of the researcher in literature searching. This is achieved based on provision or availability of and access to ICT facilities and implementation of ICT policies in universities in North Central Nigeria. In agreement with the study of Noor-Ul-Amin (2013) who observed that ICT with its enormous information sources, rapid transmission speed and easy access guarantees the satisfaction of the users with complex demand by breaking down the distance barriers and shortened the time required and ensured the right information get to the right user at the right time.

The findings revealed that insufficient computers with Internet facilities, irregular power supply, download delay, lack of adequate ICT skills, inadequate ICT infrastructure, absence or poor Internet connectivity, lack of technical assistance by library staff, are the major challenges faced by postgraduate student in the utilisation of ICT facilities for research .The findings is in agreement with the study of Mimgba (2011) who stated that ICT utilisation problems include insufficient computers with Internet facilities; frequent poor outages; slow Internet connectivity; lack of ICT skills, insufficient ICT infrastructures and

competencies among librarians to assist the user in utilising ICT facilities.

The study shows that there is significant relationship between availability of ICT facilities and kind of postgraduates' research activities in the federal university libraries in North Central Nigeria. This could be because postgraduate students' research activities in the federal university libraries studied depend to a great extent on ICT facilities for positive research outcome. This result is in an agreement with the findings of Ogunrombi cited in Ugah (2011) who stated that there is critical correlation between standard of information resources available and research output.

The study further revealed that there is significant relationship between extent of ICT utilisation and kind of postgraduates' research activities in the federal university libraries studied. This shows that the extent of ICT utilisation by postgraduate student enables access to and retrieval of relevant information that assist them in carrying out their research work. This is in agreement with the findings of Abubakar and Adetimirin (2015) who reported that utilisation of ICT facilities by postgraduate students in federal university libraries in Nigeria is critical for their research.

Conclusion

Based on the findings of the study, the research has clearly shown that postgraduate students utilize the ICT facilities available in the university libraries such as internet, worldwide web , desktop and web browser, e-mail, online databases being the most used facilities at the university libraries to access and communicate the information needed and this greatly influence their research activities. With enormous benefits that are experienced in the utilization of information and communication technologies facilities for the research activities, postgraduate students at the federal universities still experience challenges in efficient and effective utilization of these facilities for research and these challenges identified includes insufficient computer with internet connection, the slow connectivity of the internet, irregular power supply and lack of technical assistance by library staff. This could be addressed at the university by provision of adequate ICT facilities to ensure that every student have access to and utilize them. University libraries should take advantage of these opportunities by ensuring that relevant and up to date ICT facilities are available and are utilized for research by postgraduate students due to its efficiency and effectiveness.

Recommendations

Based on the findings, the following recommendations were made:

1. There should be provision of sufficient ICT facilities in university libraries by

the university Management that would be accessible to students since it greatly influences their research activities.

2. Federal government should show more commitment to the universities by making available grants for universities.
3. The university authorities should make adequate provision for back-up power plants as alternative sources of power supply to check the constant power failure currently being experienced in the federal universities.
4. The university authorities **should make** provision for adequate and effective Internet service provider to improve Internet connectivity in the university libraries.

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