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Abstract

The study was designed to determine the utilization technology tools by postgraduate students in physical sciences in south west federal university libraries. It ascertained the types of ICT facilities available; utilization, challenges encountered in the utilization and proffer solution. Descriptive survey research design was used to guide the study and 33% of the population (937) which is 312 comprises all postgraduate students in physical sciences in the institutions were made. Out of 312 copies of questionnaire distributed, 280 copies were returned representing 88.05% .quota sampling technique was used due to the enormity of the student population. The face validation of the questionnaire was determined by experts in research. The copies of questionnaire was administered face to face method which involve the researcher and research assistants moving from one department to another and from hostel to hostel. In analyzing the data collected, frequency counts, simple percentage and mean ($\bar{x}$) were used as the statistical method. The result of the finding revealed some of the facilities were available and functional; available not regularly functional, some were available but not functional and some were not available. The different purposes and extent of utilization were analyzed. The study revealed the challenges encountered in the utilization. The research work recommended for the provision of more facilities, accessibility to the facilities, provision of reliable internet services, and centralization of proposed library building on the campus, training and retraining of library staff on ICT utilization to help students search for information.

Keywords: Technology Tools, Physical Science, Postgraduate Students, University Libraries, Nigeria

Introduction

In the recent years, Information and Communication Technologies have developed very rapidly in line with the growth and convergence that occurred in telecommunication technology. The convergence of computers and telecommunication technology has popularized the electronic generation and access to information. Consequently, different technological applications are now created in order to support the operational activities of human life and organization. As a result of this, users are now expected to be computer literate to enable them explore information resources in the library. ICT is mainly concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. It includes all types or components of technological tools used to provide, store, disseminate and retrieve information for effective library service delivery. The tools include internet, personal computers, scanners, printers, CD-ROMs, flash drives,

floppy diskettes, photocopies, fax machines, audio/video tape players, digital projector/screen digital camera and T.V (Anyaogu, 2007).

In the university community, the faculty and other post graduate students are the major researchers that mostly use the available information resources for seminar, teaching and research. Hence, Omogbemi et al. (2004) in Okiki and Asiru (2011) affirmed that postgraduate students are researchers and they need variety of information from various sources. In a similar vein, Rasul and Singh (2010) stated that postgraduate students are the key producers of research in universities and an important element in their research is the access to information. However, students in science and technology will need more of online resources than those in the Arts due to the need of the currency of their research. The older an information, the better it is for researchers in the Arts but for those in sciences the more current the information the more useful it is, due to the latest events and discoveries in the field which call for continuous research.

Frankly, a typical researcher needs a variety of information to accomplish the research being undertaken and this can be gotten through internet. Information is needed on previous literature on the subject which reveals current state of research in the area to avoid duplication of research. Research activities could be divided in parts to methodology in the area of investigation; the variables that have been tested; scope and limitation of previous studies, the result of findings; further area of investigation, names and addresses of researchers conducting research in similar areas of investigation. Nigeria is linked to the internet hence it is possible for Nigerian researchers to access up to date information from the net to make their research, journal articles, conference/ workshop/ seminar papers, technical reports, scientific findings known worldwide (Afolabi,2001). It cannot be disputed that the major tool of ICT in terms of its use for downloading and uploading information is internet. Kumar and Kaur (2005) in Nwokedi and Amkpa (2011) affirmed that internet provides scientists, lecturers and students access to un-traditional sources of information at any points of the globe. Thus, access to current literature for research work has been made easier through the use of internet connectivity. The current information revolution and the

increasing impact of information and communication technology have gone a long way in modernizing the process of teaching, learning and research in most universities. Postgraduate studies are basically dwelling on research and the report of the research is given for further research. Also, different publications are made available through the internet. Some libraries have their digital collections in the internet which can easily be accessed by users. This has made it possible to have access to vast amount of resources such as dissertations, books, articles etc. All published and uploaded in the internet (Ezeani, 2010). Therefore, academic library as the gateway to information should offer high-quality vented internet search engine links, open access databases and journals, user guides / help sheets, and information literacy instructions on their websites.

The advances in ICT have progressively reduced the cost of managing information enabling individual, researchers and organization to undertake information related task much more effectively (Aliyu, 2007). OSTI,(2006) cited in Aliyu, (2007) expressed that the application of technology in teaching, learning and research is wide. For instance the use of e-prints is one of the major impacts of ICT on information network, access and use. E-print is very useful to researchers. They are scholarly and professional work electronically produced and shared by researchers with the intent of communicating research findings among colleagues pursuing common research objectives, between theoretical and experimental scientists, between those in basic and applied scientists, between scientists and engineers, between investigation and those in academic program. This is an indication that ICTs connect people. Thus the era of hoarding information is over! Information and communication technologies resources are good resources that facilitated cooperation's among information producers and users. This helps them in exchange of view, ideas and perceptions. Internet is a tool that really brings about the good information exchange and marketing.

National Academy of Science, (2000)expressed that a research work that has been conducted in United State of America can be of assistance to related research that is taking place in Africa and this is made possible as the information is being displayed online through the internet access. Researchers

cannot work without access to collaborators, to instruments, to information sources and sometimes to distant computers. Computers and communication networks are increasingly necessary for that access. Thus, three technologies are concerned with communications and collaboration: word processing, electronic mail, and networks. Word processing and electronic mail are arguably the most pervasive of all the routine uses of computers in research communication, electronic mail- sending text from one computer to another over the networks- is replacing written and telephone communication among many communities of scientists and is changing the way in which this communities are defined. Large collaborative project such as oceanographic voyages, use electronic mail to organize and schedule experiments, coordinate equipment arrival and handle other logistical details

Statement of the Problem

University libraries are the reservoir and gateway to unlimited knowledge in the world. Technology tools in the library have helped to widened the radius of the information resources available in the library of the 21st century. With the proliferation of information resources in this digital age, library being information provider are more concerned on how to capture, process, use, preserve and disseminate information. As the tools have helped in the generation and management of information; and as such could be assessed with relative ease, researchers need to explore the facilities more. As such, Postgraduate students being information users dwell so much on research which constitute 60% of their academic work. Thus, ICTs have helped in their research work in the area of searching for information, cross fertilization of idea and experiment, data gathering, analysis and discussion of findings and many other areas; the importance of technologies in research work is becoming more prominent. In this regard, university libraries need to make all effort to provide electronic users-friendly environment for the use of technology tools in the libraries.

Despite the high involvement of stake holders in building technology tools for students use in the library, and particularly the post graduate students, the researcher observes that most of them do not

come to the library to use the tools in the electronic sections and many still focus on manual method of data gathering.

Hence, the researchers considered it appropriate to find out the extent of technology tools utilization among physical sciences' postgraduate students in some selected Federal Universities Libraries in Nigeria.

Objectives of the Study

The objective of the study is to find out:

I)   the available technology tools in some selected federal university libraries in Nigeria.
II) the extent of utilization of technology tools by postgraduate physical science students in some selected federal university libraries
III) the challenges facing postgraduate physical science students in technology tools utilization.

Research Questions

This following research questions will guide the study:

I)   What are the available technology tools in some selected federal university libraries in Nigeria?
II) What are the extents of utilization of technology tools by postgraduate physical science students in some selected federal university libraries?
III) What are the challenges facing postgraduate physical science students in technology tools utilization?

Review of Related Literature

Students of the present dispensation see university library of this age as not just a collection of prints rather a place where information in non print format can also be found. That is, online information resources of present age are found in Nigerian university libraries and they are not restricted in use. The university libraries need to adequately rise to the challenge of providing the information resources.

Therefore, the use of ICT in library has also generated many concepts such as digital library, automated library, electronic library, virtual library, community network, library 2.0., and so on. An automated library is the library that has converted all the normal manual routine to electronic system. It is the first stage in creating electronic library. When databases of information are built and they can be accessed through digital medium, they are regarded as the digital library. Virtual libraries are libraries in electronic form with no physical location and contain digital information that could be accessed through internet. However, automation is the first stage of computerization in the library and it is the term used when manual routine of the library are converted to electronic system. Library users have discovered the numerous advantages attached to the use of ICT. The use of ICT in the library has a sole aim of meeting the needs of users effectively, appropriately and timely.

Generally, the utilization of ICT has a lot of invaluable advantages to library users. (Siddigui, 1997, Henderson, 1992) cited in Anyakoha (2005) itemizing the following benefits of ICT to library users: speedy and easy access; remote access; round the clock access; access to unlimited information; and facilitating the reformatting and combination of data from various sources. Ekere (2006) pointed out that university library is regarded as the heart of the intellectual life of the university. Hence, it was stated that no university can exist without a library since a university is a place meant to teach and carry out research. University library is the apex reservoir of knowledge in the university environment where one can go at will and be exposed to the whole fields of knowledge and practices of life. It is established to support and promote teaching, learning and research. The library is the soul of the university because it is the information house of the academic activities. Aguolu (1996) pointed out that since independence in 1960; there has been an unrelenting effort in the establishment of educational institutions at all levels especially in university education. It must be realized that university libraries being integral academic part of the universities generally emerged simultaneous with their parent institutions. Thus, as the number of universities are increasing so also the population of postgraduate students are growing larger and the researches they conduct are increasing and ever since the problem of

the literature explosion became noticeable in the 1970s, the developed world has devised various systems to facilitate the flow of information both within and across the countries (Ogunsola, 2004).

Over the past 25 years, academic libraries have been affected by changes in information technology. The rate of change is still accelerating in the area. The introduction of various ICT has brought significant change in the services repackaging and delivery (Okon, 2005). In other words, the concept of university library as a place you can go to retrieve only print information has drastically changed to services which provide access to the intellectual records regardless of time and space. In a related development, Ogunsola and Aboyade (2005) stated that it worth noting that both federal government of Nigeria and other international agencies are now interested in the general development of ICT in higher education in Nigeria. For instance, the Federal ministry of Education has embarked on the establishment of virtual library project. A model virtual library at National Universities Commission (NUC) will be the hub of the university-based libraries. The delivery of virtual library will be through the internet, CD ROM, and wide area network (WAN). The importance of research in national development has made some international and national agencies to contribute immensely to the use of ICT. Some agencies like UNESCO, Carnegie Corporation, and Rockefeller support the establishment of Databases at the University of Ibadan, Nigeria. These databases are helpful to postgraduate students and other researchers for the research findings. With similar grant for academic development, the corporation is presently in collaboration with Obafemi Awolowo University, Ile-Ife, Nigeria and the University library is well positioned to gain the grant. Nigerian libraries are now gradually being computerized especially in the universities. In the past 5-10 years, many Nigerian libraries are now either computerizing some of their activities either through their respective university computer centers or installing these computers in their own libraries

In Nigeria, virtually all the federal University libraries in the six geopolitical zones have started ICT initiative programme although at varying degree. Among them are University of Ibadan, University of Jos, University of Lagos, Obafemi Awolowo University, Ife, Bayero University, Kano University of

Nigeria, Nsukka and others. Hence, the universities are becoming world class and their graduates can compete with their counterparts in the western world. Thus, a closer look at the utilization of ICT resources in the university libraries as revealed by Womboh and Abba (2008) indicate that various facilities are present in some of these libraries but most postgraduate students are not fully exploring the ICT facilities.

The use of ICT facilities varies according to the level of the availability of the equipment, literacy skill and competences, awareness and accessibility. Different libraries have various kinds of policies as regard the use of their ICT resources. But generally most university libraries operate according to the same pattern. Some libraries charge users on the use of internet others make it free. In the area of accessing OPAC it is generally free in all academics libraries because it serves as the access to the library stocks or holdings. Users ICT skills also determine to a considerable extent the rate at which the ICT resources are being explored and librarian's contribution is another factor to be considered. The use of these facilities such as computers, CD-ROM, internet, slides, digital multimedia, video / VCD machine etc involve various methods which include systematized feedback system, computer based operation / network, video conferencing and audio conferencing internet / worldwide websites and computers assisted instruction. However, students, staff and the librarians will not perform well if there is no official training. The library professionals, as intermediaries, have to be experienced, to cope with the knowledge explosion which is a result of information technology (IT) and high expectation of users. (Edem, 2007).

Abraham(2004), King and Montgomery (2002) in Bamigboye, Owolabi and George, (2011) asserted that graduate students particularly Ph D students are found to be heavy users of electronic journals, most likely in their role as researcher, consulting e-journals extensively for the period when they are writing a theses or dissertation. Of course this is true, current research result are being published in academic and learned journals and for the up-coming research students coming up they need to search for these articles in order to be aware of current development in their field for further research. According to

EDUCAUSE (2011), the various degree of the ICT utilization among researchers in the body could be viewed from collaborator's or solo's perspective. E mail is rated as the highest with 90.5%. Others are teleconferencing (34.6 %), web based file storage (45.2 %), file sharing software (13.1%), Bridget-tracking software (9.8 %), and Desktop synchronization software (9.0 %) In a further statement, Valentine (1993) in Ozoemelem (2009) stated the study of students of tertiary institutions and showed that they look for the fastest way that would lead to satisfactory results when doing research by going for electronic information sources first. However, the use of ICT facilities in Kenneth Dike Library is low, irregular and ineffective as majority of users lack adequate ICT awareness, training and support to use the facilities. ICTs are tools that need to be exploited completely for modern research activities.

In a related study carried out at the University of Edinburgh, Haywood et al.(2010) reported that 50% of their current students using website report doing so 2-3 times per week on average in the current academic year, with a further 16% reporting daily use. It is clear that there is substantial rising use beyond the scheduled university teaching day. Similarly, in the SEUSSIS survey of established students at Edinburgh in 2001, it was found that 60% of students reported daily use of ICT in any form, with fewer than 5% reporting less than weekly use. Furthermore, they observed that new students arriving at the university are already used to studying with ICT. As 80% said that they used it 2-3 times per week or more and only 8% said they used it less than weekly. Clearly some of these uses are made inside the school but the school equipment demands much use outside school as 74% indicated that they also studied at home with PC. In contrast, in 1991/92, 60-70% of students reported "seldom or never" using PC for their studies at school or at home.

Established students appeared mostly to use ICT in their studies as a blend of 'free choice' and 'expected' or 'compelled' with a slight bias towards use required by teachers or course requirements. Respectively, 70% and 85% gave evidence of using ICT for researching information and preparing assignments as the dominant activities. The rate of ICT use among postgraduate students differs in respect to the environment in which they are studying. In the developed world students make use of ICT

facilities than the developing world because the resources are more readily available there. It is convenient for them.

Research Methodology

Research Design

The research design used for this study is descriptive survey design. This is because it is a design that allows a population to be studied by collecting and analyzing data from only a sample considered to be representing the entire population. Thus, Eboh (2009) explained it as a design that focuses on selective dimension of a phenomenon and measures them in a systematic and precise manner.

This design is considered suitable for this study because the population (postgraduate students in the physical sciences in universities in south western, Nigeria) is too large for the researcher to cover. Hence, a good sizeable number was surveyed and a generalization was made based on the findings. More so, the design enabled the researcher to use a reliable technique to collect data from a defined sample of the population.

Population of the Study

The population of the study consists of 937 post graduate students in the physical sciences in the five federal universities in the south western zone of Nigeria. These include: University of Ibadan (UI) Ibadan, Oyo State, Obafemi Awolowo University (OAU) Ile Ife, Osun State, University of Lagos (UNILAG), Akoka, Lagos State, Federal University of Agriculture, Abeokuta (UNAAB), Ogun State, Federal University of Technology, Akure (FUTA) Ondo State. The respondents include all the registered postgraduate students in physical sciences as at 2011. The population is homogenous in nature because it consists of only physical science students

Table 1: Population of the Study

S/N	Universities	PG Science Students(in physical science)
1.	UI	205
2.	OAU	180
3.	UNILAG	290
4.	FUTA	150
5.	UNAAB	112
Total		937

Sample and Sampling Technique

The sample covered post graduate science students of five South Western Federal Universities of Nigeria. Due to the enormity of students' population and the fact that the researcher was not able to cover the entire population, quota sampling technique was used. Quota sampling is an improvement on accidental sampling. It is the study of only a selected group of people or object that belongs to the same class. Hence, only 33% representing one-third of the entire population was covered

Sample of the Study

S/N	Universities	PG Students (in physical Science)
1.	UI	68
2.	OAU	60
3.	UNILAG	97
4.	FUTA	50
5.	UNNAB	37

Total		312

Instrument of Data Collection

The above table shows the various challenges post graduate students in physical science encountered in utilization of ICT facilities in these university libraries. Few of these statements are positively rated and accepted as challenges. In ranking order they are: insufficient ICT facilities (2.86), poor and unconducive environment (2.76), inadequate infrastructure (2.74), time constraint (2.64), library location is far from lecture hall / hostels (2.54), restricted access to the facilities in the library (2.53). these were accepted as challenges according to the space constraint (2.49), incompetence of some library staff to help users in use of the facilities (2.36) poor ICT knowledge / inability to use computers (2.23) and difficulty in locating website (2.19) were not accepted as challenges because their mean score were below the criterion mean.

The instruments used to collect suitable data for this study are questionnaire and observation checklist. The questionnaire titled ICT Utilization in Federal University Libraries by Post Graduate Physical Science Students Questionnaire (ICTUFULQ) was used. The questionnaire was divided into Section A: Bio data, B: the research questions with different clusters. Cluster one: ICT facilities' availability in Library; Cluster Two: Purpose of ICT utilization in library; Cluster Three: extent of use of ICT facilities in the library; Cluster Four: challenges to effective utilization of ICT facilities and Cluster five: Strategies to enhance effective utilization of ICT facilities. At the end each item was grouped together in cluster form in the questionnaire. The weighting of the response is based on 4 point modified Likert scale.

Another instrument that was used by the researcher is observation checklist. Observation is the direct way of studying the resources to identify the available and functional ones. Twenty-two ICT facilities were covered in the study. It was designed and used by the researcher to ascertain the ICT facilities that are in the libraries and their state of functionality.

Validation of the Instrument

Face validation of the questionnaire was determined by experts in research and other lecturers in library and information science departments, UNN and experts in measurement and evaluation in the faculty of education in order to ensure that the instrument used was able to capture accurate data that is needed for the research. In the face validation such things as the logical design, sequencing of the questions within the cluster, structure of the questionnaire as well as the suitability of the response tags were all modified and corrected to help get a good data to conduct the research. Criticisms and comments were used to improve the items, structure and format. All these processes helped to get good data for the research work.

Method of Data Collection

The researcher collected the data through face-to-face administration of questionnaire. This involved the researcher going to the respective hostels and departments of the post graduate students to administer the questionnaires and collect all the responses at the same time. Also, the services of some students were employed as research assistants. They were guided and helped to administer copies of the questionnaire to the postgraduate students in the physical sciences.

The researcher first of all obtained permission from the librarians in order to observe the facilities. The right of the respondents were be respected and every respondent remained anonymous.

Method of Data analysis

The researcher used descriptive statistical methods to analyze the data. The descriptive statistics used are: frequencies, simple percentages (%) and means score (x). Each item was be presented in the table for the purpose of clarity and simple percentage was be used to analyze the items in the questionnaire for the purpose of answering the research questions. For the responses, 4-point, likert type

scale was be used with a criterion mean point of 2.5. The point will be chosen because the average of the individual means score is 2.5

Thus, mean score of 2.5 and above was accepted and any one below 2.5 was rejected. Also, any percentage that ranged from 50% and above was accepted otherwise rejected.

Data Presentation and Analysis

Technology Tools	AF (%)	ANRF (%)	ANF (%)	NA (%)
Computer	240 (85.7)	18 (6.43)	12 (4.26)	4 (1.43)
Internet	226 (80.7)	20 (7.14)	16 (5.71)	12 (4.29)
Floppy Disk	146 (52.14)	14 (5)	28 (10)	52 (18.57)
CD-ROMs	154 (55.71)	14 (5)	22 (7.86)	56 (20)
Flash Drives	168 (60)	14 (5)	18 (6.43)	58 (20.71)
Video, tape player	106 (37.86)	16 (5.71)	28 (10)	94 (33.57)
Multimedia digital projector	144(51.43)	22 (7.86)	22 (7.86)	56 (20)
Projector screen	156 (56.43)	12 (4.28)	24 (8.57)	50 (17.86)
Functional email	146 (52.14)	16 (5.71)	46 (16.43)	42 (15)
Intercom	90 (32.14)	14 (5)	46 (16.43)	48 (17.14)
Website	244 (87.14)	16 (5.71)	12 (4.28)	4 (1.43)
Digital camera	106 (37.86)	8 (2.86)	26 (9.29)	72 (25.71)

These are the facilities in raking order: institutional (university) website (87.14%), computer (85.78%), internet (80.7%), photocopies (70.71%), projector screen (56.43%), printer (42.14%), multimedia digital projector (51.43%), functional email (52.14%), floppy disk (52.14%) and flash drive (60%), CD ROMs (55.71%) the result also correspond with the researcher's observation checklist.

S/N	ICT Facilities	VHE	HE	LE	NA	X
1.	Computer	74	68	114	10	2.77

2.	Internet	88	56	98	30	2.74
9.	Floppy Disk	14	40	102	100	1.88
10.	CD-ROMs	42	50	80	62	2.39
11.	Flash Drives	64	52	50	92	2.31
12.	Video, tape player	12	24	88	124	1.69
13.	Multimedia digital projector	44	38	92	78	2.19
14.	Projector screen	44	42	84	76	2.22
15.	Functional email	42	44	94	66	1.51
16.	Intercom	38	29	58	102	1.01
17.	Website	112	76	34	20	3.16
18.	Digital camera	26	24	96	90	1.96

Extent of utilization among the users the mean scores and frequency counts were computed and analyzed. The means score of each item is compared with the criterion mean (2.50). Any mean score of each item that is greater than the criterion mean is positively rated and accepted as an extent of use which could be very high, high or low depending on the mean score.

The above table shows the facilities that were used at a very high extent such as institutions' (university) website (3.16), computers (2.77), internet (2.74), photocopiers (2.54), while, printer (2.35), and CD ROM (2.39), flash drive (2.31), were used at low extent. Projector screen (2.22), Multimedia / digital projector (2.19), digital camera (1.96) and library e-mail (1.51) were used at a very low extent.

S/N	Challenges encountered	SA	A	D	SD	X
1.	Poor and unconducive environment	66	54	22	44	2.76
2.	Unfriendly attitude of library staff	54	98	52	62	2.54
3.	Insufficient ICT facilities	70	106	50	28	2.86
4.	Inadequate infrastructures	62	96	56	36	2.74

5.	Slow internet connection	58	118	52	52	2.65
6.	Difficulty in locating websites	22	72	94	68	2.19
7.	Poor ICT knowledge	38	64	74	80	2.23
8.	Time constraints	54	110	68	42	2.64
9.	Library location is far from lecture hall / hostels	50	100	70	52	2.54
10.	Erratic power supply	74	70	68	42	2.69

The above table shows the various challenges post graduate students in physical science encountered in utilization of ICT facilities in these university libraries. Few of these statements are positively rated and accepted as challenges. In ranking order they are: insufficient ICT facilities (2.86), poor and unconducive environment (2.76), inadequate infrastructure (2.74), time constraint (2.64), library location is far from lecture hall / hostels (2.54). These were accepted as challenges according to the space constraint (2.49), poor ICT knowledge (2.23) were not accepted as challenges because their mean score were below the criterion mean.

Conclusion and Recommendations

It can be concluded and recommended that technology tools facilitate electronic library resource use. As such, librarians and concerned stakeholders should ensure there is provision for training centre within the library especially academic libraries to ensure users gain the skills of manipulating these tools for optimum utilization of library resources in order to achieve the goals and objectives of why the libraries were established.

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