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RELATIONSHIP OF USER EDUCATION, COMPUTER LITERACY AND INFORMATION AND COMMUNICATION TECHNOLOGY ACCESSIBILITY AND USE OF E-RESOURCES BY POSTGRADUATE STUDENTS IN NIGERIAN UNIVERSITY LIBRARIES

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BY

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ABSTRACT

Introduction. The rapid change in university libraries setting has necessitated new tools for searching information, particularly for e-resources by postgraduate student's users. The preference for e-resources by postgraduate students has been to some extent determined in previous studies by accessibility to information and communication technology (ICT), user education and computer literacy.

Method. A survey research design and multi-stage sampling technique was adopted to select 2, 726 from 54578 postgraduate students from four faculties in 16 federal conventional universities in Nigeria. The data set was collected using questionnaires, a test and an interview schedule for e-resources librarians/ system librarians and was analysed using percentage, Pearson's product moment correlation and multiple regression.

Results. The usage of e-resources among the postgraduate students was adjudged low ($\bar{x}$ = 2.45) with a slightly above average user education ($\bar{x}$ =2.60) and medium computer literacy (56.3%). In addition, there was a low level of accessibility to ICT facilities ($\bar{x}$ = 2.45). ICT accessibility (r = .78), computer literacy (r = .74) and user education (r = .32) had positive relationships with postgraduate students' usage of e-resources. The level of user education, computer literacy and ICT accessibility jointly and significantly predicted postgraduate students' usage of e-resources in Nigerian university libraries ($F_{(3, 2281)} = 1168$; R= 0.778; R^2= 0.606). Further, user education (β =.056), computer literacy (β = .064) and access to ICT facilities (β = .819) contributed relatively to the prediction of use of e-resources. This shows that the higher the postgraduate students are exposed to user education, ICT facilities and computer literacy skills, the better the use of e-resources for their researches.

Conclusion. User education, computer literacy and access to Information and Communication Technology facilities are predictors of the use of e-resources by postgraduate students. However, to further enhance the use of e-resources among postgraduate students, university libraries in Nigeria should employ constant library orientation and computer literacy programmes. In addition, more ICT facilities should be procured to increase accessibility. **Keywords:** Library User education, Computer literacy, ICT accessibility, Nigerian postgraduate students, E-resources usage, Nigerian university libraries,

INTRODUCTION

Postgraduate research is a formal area of study that is recognised by a university. Postgraduate students form a significant group of researchers in a university (Rasul and Singh, 2010). Therefore, a starting point would be to examine how this group of students views the role of their university libraries in meeting their research needs. Research needs could be explained as that which is necessary to facilitate the student's scholastic activities, but is however lacking. Until and unless these needs are met by university libraries, such graduates would not meet the social, economic and manpower needs of their societies. A university library is an integral to postgraduate and research programmes in any university. The library normally strives to meet the needs of postgraduate students and provides services, facilities, as well as relevant resources for research, which include full-text journal and bibliographical databases.

The provision of such relevant information resources by the university libraries will in turn help the postgraduate students carry out their research projects and submit them as a pre-requisite for completing their degrees. Postgraduate students are assessed based on the outputs of their research. Therefore, this has led postgraduate students in university libraries to making greater demands for access to information and on the quality of the information provided be it print or e-resources.

The benefits of e-resources, according to Oyedum (2005), are that they can be traced easily from indexing and abstracting databases. Access to them can be from so many points such as the user's home, office or dormitory, whether or not the physical library is open. In addition, the library can get usage statistics that is not readily available for print collections. Electronic resource collections save space and are relatively easy to maintain (Montgomery & King, 2002). When total processing and space costs are taken into account, electronic collections may also result in some overall reductions in library costs.

User education is required to enable postgraduate students to selectively retrieve accurate and adequate information stored in the library in electronic formats instead of those information that are irrelevant for their research work. User education will reduce the time spent in seeking and retrieving e-resources for graduate students. Opaleke (2002) posits that the essence of user education is to enable the learner to put what he has learnt into practical use. Therefore, the knowledge acquired in user education must reflect in the life of the students through their

information seeking and use. Zoellner, Samson and Hines (2008) establish that improving users' knowledge of their libraries resources will be an influence for more usage and more demands on the library.

Owing to information explosion, university libraries are increasingly becoming automated. The implication of this is that more information is digitised. It is, therefore, expedient for postgraduate students to be computer-literate because searching for books in a card catalogue is gradually giving way to searching for information through the online public access catalogue (OPAC). It is more likely that only postgraduates with adequate computer literacy can access, retrieve and use the digitised information. Levels of computer literacy may vary among higher education students entering university. It is, therefore, important to include computer literacy in the curriculum of higher education students. Sweaney, Manley, Meeks and Valente (2001) recognise the need to be cautious in assuming that all students have similar exposure to computers prior to their entry into university higher education.

There could be a relationship between computer literacy of postgraduate students and their scholastic performance in the present library environment that is fast becoming computerised. It could be inferred that students with high computer literacy skills may use the library environment with computers and ICT at ease, while those with low computer literacy skills may find it difficult. Therefore, computer literacy could enhance the performance of postgraduate students in a computerised library environment. This implies that university libraries should also teach postgraduate students to be computer-literate so that they can operate at ease in the library. This shows that a wide array of information are stored and retrieved in ICTs and computers. Access to ICT and computer facilities in university libraries could be a major drive to e-resources use. The various ICT facilities that include those presenting information in the form of audio, visual, audio visual and online may facilitate their use among postgraduate students offering diverse courses in the universities if access to them is readily provided in the libraries.

Statement of the Problem

With the developments in ICT, university libraries in Nigeria are providing resources in electronic formats. Indeed, many of the university libraries have made significant investment in

providing services through e-resources and other computer-based technologies so that users such as postgraduate students can gain access to e-resources that will add value to their scholarly research work. Even though the use of e-resources by postgraduate students is accepted world-wide as contributing to their research work, existing literature records low use of e-resources by postgraduate students in most university libraries in Nigeria. This has diminished the potentials and benefits, considering the huge investment on e-resources. This may be due to postgraduate students lack of awareness of the potentials and benefits of e-resources and therefore, do not use them, while the few that use them do not optimally utilise them for their scholastic works. This may probably be due to lack of adequate user education on the potentials and benefits of e-resources and how to locate and retrieve them. In addition, some of the students may lack the basic computer literacy skills that can enable them to access needed e-resources. Furthermore, some of the postgraduate students might be hindered from use of e-resources due to inadequate access to ICT in the libraries and this will affect their overall development. Yet, not much investigation has been done recently on the correlation of these three factors to the use of e-resources, particularly on their combined effects. It is in the light of these that the present study is conducted to determine the extent to which the use of e-resources by postgraduate students is correlated by user education, computer literacy and ICT accessibility in university libraries in Nigeria.

Research Questions

The research questions are:

1 What is the level of user education possessed by postgraduate students in federal universities in Nigeria?
2 What is the computer literacy level of the postgraduate students?
3 How accessible are ICT facilities to postgraduate students for use of e-resources in federal university libraries in Nigeria?
4 What is the frequency of use of the available e-resources by postgraduate students in federal university libraries in Nigeria?

5 What is the relative contribution of user education, computer literacy and ICT accessibility on the postgraduates' use of e-resources?

Hypothesis

The following null hypothesis was tested in the study at 0.05 level of significance:

1 There is no significant composite influence of user education, computer literacy and ICT accessibility on postgraduate students' use of e-resources.

LITETRAURE REVIEW

Bajpai, Mai and Bajpai (2009) defined e-resources as one which requires computer access or any electronic product that delivers a collection of data, be it text referring to full text bases, e-journals, image collections, other multimedia products and numerical, graphical or time based, as a commercially available title that has been published with an aim of being marketed.

Electronic resources are the electronic image of information. They are available in various forms like e-books, digital libraries, online journal magazine, e-learning tutors and on line test. For the reason of their effective presentation with multimedia tools, e-resources have become the source of information for most university libraries today. Electronic resources deliver the collection of information as full text databases, e-journals, image collections, multimedia in the form of CD, tape, internet, web technology, etc. E-resources may include e-journals, e-discussions, e-news, data archives, e-mail, on line chatting, etc. Electronic information sources are a wide range of products going from electronic periodicals to CD-ROMs, from mailing list to databases, all of them having a common attribute of being used and some time modified by a computer.

Considering the importance and purpose of e-resources use as providing accurate and timely information, especially for postgraduate students that embark on researches, this then explains the rationale for the introduction and acquisition of e-resources in university libraries. Previous studies have been carried out on the use of e-resources in university libraries among postgraduate students (Swain & Panda 2009; Okiki & Asiru 2011). For example, Tenopir (2003) analysed the results of over 200 studies of the use of e-resources in libraries in the United States of America (USA), published between 1995 and 2003, and the major findings indicated that e-

resources have been rapidly adopted in university libraries in the USA. Similarly, Bar-llan, Bluma and Wolman (2003) in their study on the use of e-journals among postgraduates and academic staff of Israel universities submitted that its use increased with time and the variables such as age and academic position was inversely related to the use of e-journals. Abubakar and Adetimirin (2016) reported low use of e-resources among Nigerian postgraduate students.

E-resources use by postgraduate students in university libraries in Nigeria shows that an update is desirable for the students' research quality. Okebukola (2002) submitted that e-resources in Nigerian university libraries would improve the quality of teaching and research with consequent enhancement to scholarship. Fabunmi (2009) reported on the challenges and the prospects of virtual library in a university system and opined that most university libraries in Nigeria are in deplorable conditions due to inadequate funding. This has manifested in university libraries with few e-resources, deterioration of facilities, inadequate equipment and even library buildings. Such prevailing conditions are not conducive for study and research. To this, Fabunmi (2009) concluded that in the present period of information explosion, university libraries should use appropriate technology to access e-resources in order to enable the universities carry out their traditional functions of teaching, research and public service effectively.

User education as defined by Kumar and Phil (2009) is the "programme through which potential users of information in the library are made aware of the information sources. To Islam and Tsuji (2010), user education refers to the broad set of skills and understanding that enable a person to recognize information needs, decide which resources will best answer those needs, know how to use the resources effectively and evaluate the information. User education is one of the courses offered by university libraries that aim to educate their users, including postgraduate students on how to use the library.

Various user education practices in university libraries in Africa were examined by Baro and Keboh (2012) to identify the barriers facing user education programmes in African university libraries. This was done to provide suggestions on how best to improve user education practices. A survey of five leading university libraries in Africa showed that user education training was mainly by means of library tours/orientation sessions, introductory information skills classes, and teaching advanced information skills (e.g. database searching). There are, however, many barriers: a lack of interest by students, professors, and library management; inadequate human

resources to teach user education courses; lack of facilities; low use of distance education for teaching user education; and an absence of user education policies. This result supports the argument that university authorities in Africa and other developing countries must see the need to provide the necessary competence for their students with a view to facilitating their use of library's resources in university libraries, and consequently enhancing their productivity in terms of research works. It is crucial for librarians to collaborate with other stakeholders in their institutions to ensure an appropriate user education policy formulation and implementation in their institutions.

Popoola and Zaid (2007) lamented that Nigerian university libraries have not been taking user education very serious as a means of stimulating the use of library products and services. Considering that a university library is one of the sophisticated information systems, students can derive maximum benefit from it, only if they are taught how to retrieve needed information through user education. Adeleke and Olorunsola (2010) reflected on the experience of Redeemer's University library, Nigeria, in its user education training programme and revealed that while the programme enabled a good number of students to attain information literacy, much is needed to be done by both libraries and faculty to attain the desired result of making students information-literate.

Computer literacy refers to effectiveness in searching for needed information by using electronic sources. It is the extent to which postgraduate students are capable of conducting electronic information searching or use computer facilities to locate relevant sources of information for their scholarly work. Computer literacy can be defined as comprising a variety of complex skills (which include: booting a computer, how to use a keyboard, edit work, retrieve information from computers, send and receive e-mails, etc.) which users need in order to function effectively in digital environments (Eshet-Alkalai, 2004).

Dange (2010) studied postgraduate students' computer literacy viz-a-viz their e-resources use of Ku Vampu University, India and reported that the students entering the university at the postgraduate level had a mediocre knowledge of computer. Even though, the students had little knowledge of the computer at their respective high schools, there are still more to learn in terms of information retrieval, storage and editing. Dange (2010) asserts that universities still need to

provide introductory computing literacy subjects to ease postgraduate students' use of e-resources that will facilitate their research work.

Eves and Dalzeil (2007) posits that computer literacy training is useful for effective use of e-resources in university libraries among postgraduate students because most recent and up-to-date information are electronically stored. Their submission reflects that of Dange (2010). However, other academic groups at other universities espoused the notion that there is no need to compel students to study dedicated end-user computer skills, but teach computer literacy only at the undergraduate levels (Case, Mackinnon & Dyer, 2004; Wallace & Clariana, 2005). To explore and improve the use of e-resources, the University of Iowa has incorporated introductory masters' level students to computer technology (Yolanda, Edwards and James, 2005). Earlier on, Abubakar and Adetimirin (2015) reported moderate computer literacy among Nigerian postgraduate students that set in low use of e-resources in their libraries.

Computer literacy can be a tremendous asset that will assist in retrieving vital information needed by postgraduate students in university libraries. With ICT facilities available in most university libraries in Nigeria, postgraduate students who are computer-literate could find it easy to search for their information needs in the libraries. The internet and various forms of web-enabled technologies are growing exponentially, more and more pieces information are becoming digitised. Therefore, for effective information searching to be achieved by postgraduate students, computer literacy is critical.

The International Encyclopaedia of Information and Library Science (2003) defined ICT as the application of modern electronic and computing technology to the creation and storage of facts, data or information and its transmission to users by various communication media. Mabawonku and Okwilagwe (2004) opined that ICT comprises machines and tools necessary for the generation, processing, storage, retrieval and dissemination of information. According to Angello and Wema (2010), ICT can be defined as the techniques, methods and tools used to access information and communicate with others.

Universities in the present times have started giving greater attention to research. The universities are doing this through various means such as developing appropriate policies, providing funds and facilities available for research, and encouraging students to do research. In most postgraduate programmes in universities, students are required to carry out a research project or theses/dissertations that are to be submitted as pre–requisite for completing their

degrees. This situation has called for research materials by the postgraduate students. In a similar vein, Singh (2007) submits that postgraduate students-researchers today are making greater demands for access to information for their research works in academic libraries.

Libraries within universities are gateways to information (Dange, 2010). In recent times and in line with changing role of universities, the vision and mission of university libraries has changed to meet these present needs of information access and flexible policies to using the libraries. Therefore, the basic role of university libraries as centre for learning and research is put to challenge today for inadequate or complete lack of ICTs. In consonance with this assertion, Campbell (2006) averred that university libraries are complex institutions with multiple roles. They provide not only books, but also services to facilitate research activities such as bibliographies, information literacy and ICTs, etc.

One area university libraries provide access to e-resources for students' use is through the provision of computers and internet connectivity. Supporting this view, Sulemani and Katsekpor (2007) reported that with the increasing number of computers and internet connectivity in academic libraries, access to information has vastly increased. Students today are having the opportunity to select from a wide range of e-resources in an ever-increasing variety of formats, in addition to complex information gathering that was not anticipated a few decades ago. This particular scenario appears to be for the developed nations, where the traditional options available within the library, including browsing the latest journal collections and searching manually through the print index, are supplemented by conducting a literature search in person or through an intermediary. These searches are conducted either on CD-ROM or online; and in many instances, the online search is available either at home or in the university libraries (Renwick, 2005). In the same vein, Bane (1995) examined the influence of CD-ROM full text databases on the use of print collections among graduate students of Penn state, USA and found a consistent decrease in the use of the print collections. Similarly, Rogers (2001) examined the impact of remote access to e-resources and confirmed similar trends, where print journal usage by students of Ohio State University has significantly decreased.

THEORETICAL AND CONCEPTUAL FRAMEWORKS

A framework is a set of formal ideas put together for making decisions. For postgraduate students to make decisions and maximally put e-resources to use, they need certain formal ideas

to influence them. These formal ideas (user education, computer literacy and ICT accessibility) will influence their acceptance, adoption and put to use the available e-resources in their libraries. Understanding why people accept or reject new information systems has been one of the most challenging issues in the study of new technology adoption (Hackbarth, Grover and Yi, 2003; Ikart and Ditsa, 2004). Given the high rate of failure of ICT initiatives intended for the creation of development opportunities, a solid understanding of the determinants of user acceptance of particular ICT is crucial not only for theory building but also for practical effectiveness (Park, Roman, Lee and Chung, 2009). Among the various efforts to understand and predict the process of user acceptance of information systems, the Technology Acceptance Model (TAM) 2 introduced by Davis (1986) is one of the most cited theoretical frameworks (Park et al, 2009). The model is designed to measure the relative importance of user perceptions of the systems' *usefulness* and *ease of use* in their adoption behaviour. In addition to these two main determinants, TAM suggests that external factors can have significant effects on users' adoption as they are mediated through these two perceptions.

TAM2 has been applied to studies on the adoption behaviour of various information technology and systems (Adams, Nelson, & Todd, 1992; Chau, 1996; Chau & Hu, 2002; Park et al, 2009). A number of studies extended the basic framework of TAM2 and examined external variables that affect the key constructs − perceived ease of use, perceived usefulness, and usage intention. For example, Venkatesh and Davis (1996) suggested that users' computer self-efficacy affects perceived ease of use both before and after hands-on use, while objective usability has an effect on perceived ease of use only after direct experience with the system.

The ultimate goal of TAM2 is "use" after acceptance and adoption of an information system within a social system, such as postgraduate students in universities in Nigeria. The dependent variable for this study is "use of e-resources". This has a relationship with the ultimate goal of TAM2. So also, the independent variables, user education, computer literacy and ICT accessibility have their final goal as "use". This has relationship with the ultimate goal of TAM2, which is also "use". For example, if user education is defined as the activities to teach students about library services and facilities, library resources and search strategies, and expected that the outcome is to "use" the library's resources. In addition, computer literacy is defined as the ability of students to have knowledge on how to use computer facilities in information searching, retrieval and "use" of e-resources. The ultimate outcome here too is "use". Furthermore, ICT

accessibility is the degree to which ICT is easily located by students in university libraries to retrieve e-resources and "use". The "use" comes after acceptance and adoption of the ICT. However, the final outcome is "use" of e-resources. This end goal "use" of the independent variables has relationship with the ultimate goal of TAM2. TAM2 suggests that such external factors can have significant correlation on the acceptance, adoption and use of an information system that contains e-resources. Therefore, these variables anchor the Technology Acceptance Model (TAM)2 as a theoretical framework.

Conceptual Framework

The conceptual framework of this study (Fig.1) shows how the independent variables (user education, computer literacy and ICT accessibility) relate to the dependent variable (use of library e-resources). The provision of adequate user education as instruction designed to teach postgraduate students the rudiments of library services, facilities and organisation, library resources and search strategies may provide the necessary information skills and in turn influence them to retrieve and use the library's e-resources. Also, computer literacy is linked to use of library's e-resources. In other words, the possession of computer literacy − having knowledge of how to use computer facilities in information searching and retrieval − may correlate with postgraduate students' use of library e-resources. As established in literature, the vast majority of postgraduate students in universities globally recognise the importance of computer literacy as the key for success in their personal and professional lives. In addition, ICT access through such facilities as computers, the internet, CD ROM, videos, etc. could influence the use of library's e-resources for postgraduate students because of ease of locating and accessing needed information.

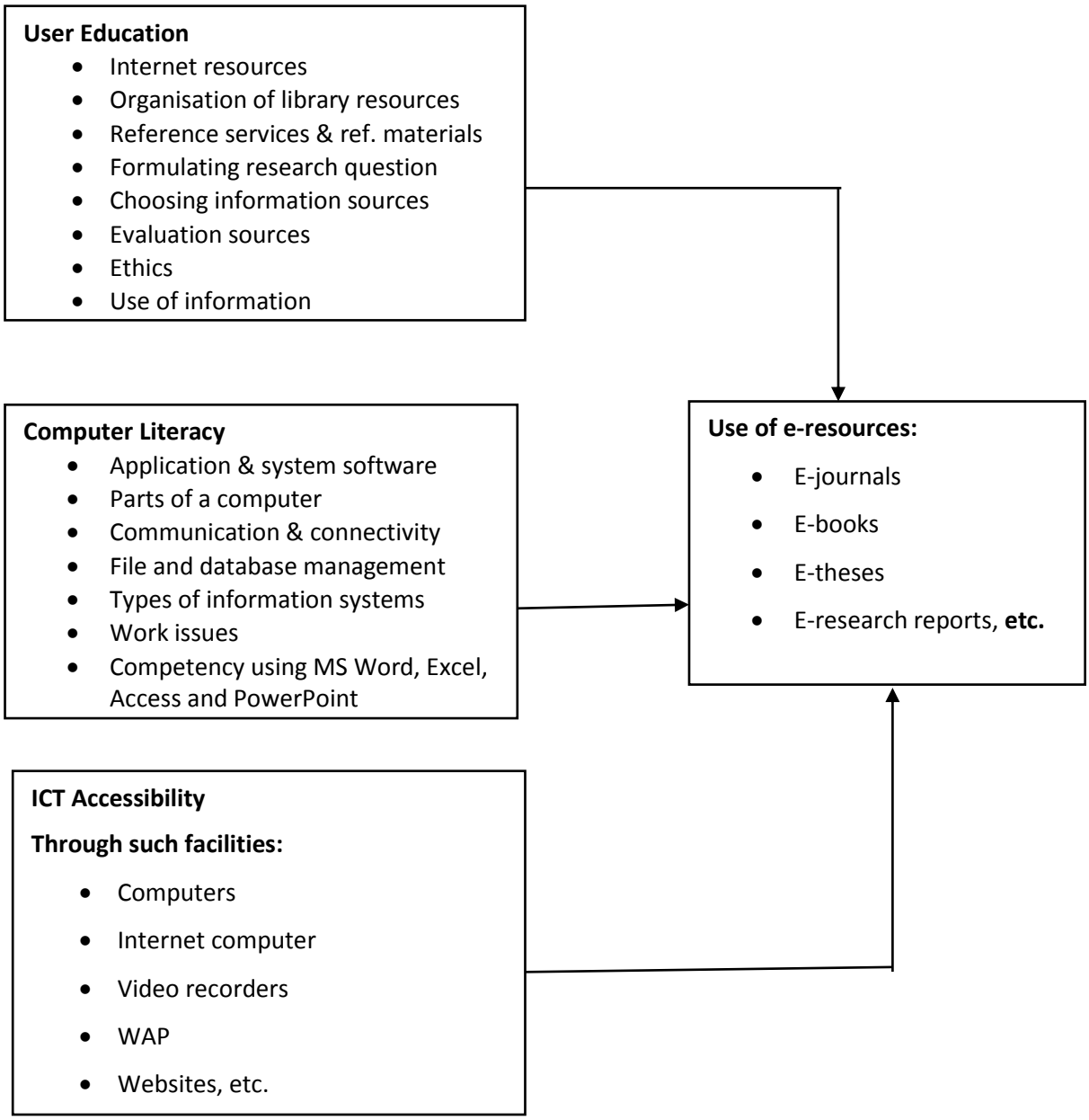

Fig. 1: *Conceptual framework for user education, computer literacy, ICT accessibility and use of library e-resources (Self constructed)*

METHODOLOGY

The study adopted the descriptive survey research design of the *expost facto* type. The population for the study include all postgraduate students in the 16 conventional universities and their e-resources librarians. The Multi-stage sampling technique was adopted and involves the

random selection of 10 out of the 16 conventional universities, purposive selection of four faculties (Arts, Education, Sciences and Social Sciences), and purposive selection of two departments in each faculty with the highest number of postgraduate students, lastly the proportionate random sampling technique was used as shown in Table 1. The sampling fraction used for selecting the sample was 5%. Thus, a total of 2728 postgraduate students out of 54,578 were selected. A test on Postgraduate Students' Computer literacy and questionnaires on Postgraduate Students' Library User Education, Postgraduate Students' Use of Library E-resources, Questionnaire on ICT Accessibility to Postgraduate Students' and an Interview Check List for System Librarians/ Librarians in Charge of e-resources were used to collect data. Data collected were analysed using descriptive statistics, viz: frequency count, percentage, mean and standard deviation. Also, Multiple Regression Analysis was used to test for the combined influence of user education, computer literacy and ICT accessibility (composite influence) on use of e-resources.

Table 1. Samples Selected and Sampling Fraction

S/N	University	Study Population	Sample Size
1	Ahmadu Bello University Zaria	8800	440
2	Bayero University Kano	2481	124
3	University of Abuja	3157	157
4	University of Benin	2002	100
5	University of Calabar	9946	497
6	University of Ibadan	10986	549
7	University of Jos	2641	132
8	University of Lagos	10450	522
9	University of Maiduguri	1692	84
10	Usman Danfodio University Sokoto	2423	121
	Total	54578	2726

RESULTS AND DISCUSSION

Research Question 1: What is the level of user education possessed by postgraduate students in federal universities in Nigeria?

The descriptive statistics of the level of user education possessed by the postgraduate students indicated that 24 items out of the 30 items had high mean scores ranging from 2.50 to 2.97. This revealed that most of the items are above the mean of 2.50 of the scale of maximum of 4 points. It thus implied that the postgraduate students' user education was relatively high. The other six items had low mean scores below the 2.50 mean of the scale. The weighted average of 2.60 summarised the mean scores implying that the level of user education of the students is relatively high.

Table 2 further revealed the level of the library user education of the postgraduate students.

Table 2: Level of Library User Education of the Postgraduate Students

Level of Library User Education	Frequency	Percent
High	1309	57.3
Medium	711	31.1
Low	265	11.6
Total	**2285**	**100.0**

Using the index mean ($\bar{x}$) of 2.50 as cut off points for classification (Table 2), those with mean score lower than the index mean of 2.50 were 265(11.6%) and those with mean score higher than the index mean were 1309 (57.3%) out of the 2285 postgraduate students. This implies that more than half of the postgraduates had high user education level. It was also found that the level of library user education of the postgraduate students was high. This implies that most of the students had reasonable level of library user education. This is expected because some might have had sound user education at their undergraduate days apart from the library orientation and staff guidance they received at the postgraduate level.

Furthermore, 50% of the librarians in charge of e-resources/systems librarians interviewed attested to the fact that their postgraduate students' user education was reasonable

enough for retrieving e-resources in the library. However, 1% were not categorical but responded that the postgraduate students could retrieve e-resources only if they attend the library orientation. This assertion was validated by Tramullas and Casabon (2010) that postgraduate students need to be instructed on how to exploit and use e-resources because university libraries spent huge sums of money on providing such resources and services. Questions could be asked on why some students use libraries more than others. And why is using some libraries easier than others? Perhaps, the main factor affecting library use is familiarity with how the library, as a whole, can be optimally used. For the postgraduate students to optimally use the library and its resources, they have to attend the user education programme.

Research Question 2: What is the computer literacy level of the postgraduate students?

Table 3 presents the level of the postgraduate students' level of computer literacy in the regions of 'high, medium and low'.

Table 3: Level of Computer Literacy of the Postgraduate Students

Level of Computer Literacy	Frequency	Percent
High	455	19.9
Medium	1286	56.3
Low	544	23.8
Total	**2285**	**100.0**

From the analysis of the computer test results of 2285 students, the lowest score obtained was 20% while the highest was 95%. The mean score for all the students was 48.15% out of the maximum score obtainable of 100%. This falls below the 50% mark which could be represented as pass mark. Further analysis to determine the levels of the students' computer literacy was done using the 50% as cut off point for classification of the levels (Table 3). The result showed that 1286 (56.3%) had medium level of computer literacy, and 455 (19.9%) had high level of computer literacy (Table 3). This shows that the students' computer literacy was average.

The average level of the students' computer literacy implies that their ability to retrieve e-resources from the computers will be moderate. The question of being computer-literate will remain a challenge in developing countries because most university libraries do not have enough computers, or access to the computers is prevented for one reason or the other (Okello-Obura and Magana, 2008). It is only when the students are computer-literate that they can learn how to access e-resources. Thachill (2008) justified this by submitting that e-resources and the new method of education (e-learning) have generated an even greater need for computer instruction. In addition, Kinengyere (2007) asserts that for effective use of e-resources, computer literacy is essential. However, other academic groups espoused the notion that there is no need to compel students to be computer-literate (Case, MacKinnon & Dyer, 2004; Wallace & Clariana, 2005).

Research Question 3: How accessible are ICT facilities to postgraduate students for use of e-resources in federal university libraries in Nigeria?

Table 4 (a & b) indicates the accessibility of ICT facilities to postgraduate students on a scale of highly accessible, accessible, fairly accessible and not accessible.

Table 4a: Accessibility of ICT Facilities to Postgraduate Students

S/N	ICT Facilities	Accessibility								$\bar{X}$	Std. Dev.
		Highly Accessible (4)		Accessible (3)		Fairly Accessible (2)		Not Accessible (1)			
		N	%	N	%	N	%	N	%		
1	Computers	965	42.2	750	32.8	233	10.2	337	14.7	3.03	1.06
2	Scanner	540	23.6	648	28.4	397	17.4	700	30.6	2.45	1.16
3	Printer	557	24.4	775	33.9	285	12.5	668	29.2	2.53	1.15
4	Wireless Access Point (WAP)	466	20.4	846	37.0	313	13.7	660	28.9	2.49	1.11
5	Digital Camera	459	20.1	766	30.9	416	18.2	704	30.8	2.40	1.12
6	Fascimile	304	13.3	747	32.7	269	11.8	965	42.2	2.17	1.12
7	Internet Connectivity	635	27.8	809	35.4	282	12.3	559	24.5	2.67	1.13
8	Websites	566	24.5	937	41.0	295	12.9	487	21.3	2.70	1.07
9	Television	514	22.5	763	33.4	379	16.6	629	27.5	2.51	1.12
10	Video Conference	358	15.7	666	29.1	341	14.9	920	40.3	2.20	1.13
11	Telegraph	346	15.1	717	31.4	362	15.8	860	37.6	2.24	1.11
12	E-mail	591	25.9	854	37.4	226	9.9	614	26.9	2.62	1.14
13	CD-ROM	489	21.4	639	28.0	346	15.1	811	35.5	2.35	1.17
14	Fixed Telephones	367	16.1	682	29.8	395	17.5	841	36.8	2.25	1.11
15	Mobile Telephone Network	515	22.5	908	39.7	249	10.9	613	26.8	2.58	1.11

Table 4b: Accessibility of ICT Facilities to Postgraduate Students

S/N	ICT Facilities	Accessibility								$\overline{X}$	Std. Dev.
		Highly Accessible (4)		Accessible (3)		Fairly Accessible (2)		Not Accessible (1)			
		N	%	N	%	N	%	N	%		
16	Multimedia Projector	396	17.3	648	28.4	441	19.3	800	35.0	2.28	1.12
17	Micro Slides	314	13.7	719	31.5	501	21.9	751	32.9	2.26	1.10
18	Audio Tapes	485	21.2	589	25.8	441	19.3	770	33.7	2.35	1.15
19	Audio Tape Player	390	17.1	811	35.5	312	13.7	772	33.8	2.36	1.12
20	Video Tapes	454	19.9	777	34.0	277	12.1	777	34.0	2.40	1.15
21	Photocopier	571	25.0	585	25.6	382	16.7	747	32.7	2.43	1.18
										Weighted Average=2.44	

N=2285

From Tables 4 (a & b), only seven items out of 21 yielded high mean scores on accessibility of ICT facilities in respect of the postgraduate students (means range between 2.51 and 3.03). For the remaining 14 items, the mean scores were low, falling below the 2.50 mark out of 4.00 highest points possible. This showed that most of the ICT facilities were not accessible to the postgraduate students. On the whole, the postgraduate students' level of accessibility to ICT facilities was low (weighted average = 2.44).

The result pertaining on how accessible ICT facilities for postgraduate students to retrieve e-resources were revealed that the postgraduate students' access to ICT facilities was low. Here, the question remains whether the university libraries could afford to increase the number of networked computers and other ICT facilities to match the ever increasing number of postgraduate students in their universities. The increase in postgraduate students' admission without a corresponding increase in the number of ICT facilities to provide access to e-resources will remain a problem in university libraries in Nigeria, for lack of deliberate increase in ICT facilities. Most likely, only very few postgraduate students could likely afford access to needed

ICT facilities without the university libraries support. This will certainly have dual implications on both the students and the libraries. On the students' part, necessary ICT facilities to make e-resources accessible for their research work would be lacking. This would slow their research work and eventually set in frustration. Also, the university libraries will not have justified its existence if the needed e-resources available could not be retrieved for use because of lack of access to ICT facilities.

This finding bear out the report of Osagie (2008) who examined the perception and use of ICT facilities in Kenneth Dike Library among postgraduate students of the University of Ibadan. His result revealed that the use of ICT facilities to support learning and research by the postgraduate students was low, irregular and ineffective. Certainly, this will create a challenge to the use of e-resources by the postgraduate students. Similarly, Behler (2009) reported on provision of access by Penn State University library, using Sony Reader and found out that the Sony Reader lacked much functionality for academic use such as better interaction with text and is not suitable for use in the hard sciences. This lack of functionalities hindered their research students' access to needed e-resources. Contrary to low access to ICT facilities as found in this study, Abel (2009) reported that the University of the Cushing Academic Library, Australia, took advanced step and got rid of most printed materials, with all library resources to be used on laptops and tablet computers. His finding demonstrated ready access and use of e-resources by postgraduate students.

Research Question 4: What is the frequency of use of e-resources by postgraduate students in federal university libraries in Nigeria?

Table 5 presents the analysis of the result of the frequency of use of e-resources by the postgraduate students in their libraries.

Table 5: Postgraduate Students Use of E-resources

S/N	In the University Library, I use:	Daily (4)		Once a week (3)		Occasionally (2)		Never (1)		$\overline{X}$	Std. Dev.
		N	%	N	%	N	%	N	%		
1	E-journals	827	36.2	606	26.5	358	15.7	494	21.6	2.77	1.15
2.	E-data archives	458	20.0	594	26.0	477	20.9	756	33.1	2.33	1.13
3	E-manuscripts	457	20.0	611	26.7	491	21.5	726	31.8	2.35	1.12
4	E-books	538	23.5	589	25.8	473	20.7	685	30.0	2.43	1.15
5	E- magazines	526	23.0	773	33.8	370	16.2	616	27.0	2.53	1.12
6	E-theses	431	18.9	655	28.7	444	19.4	755	33.0	2.33	1.12
7	E-newspaper	732	3.2	601	26.3	359	15.7	593	26.0	2.64	1.18
8	E-mail	744	32.6	667	29.2	338	14.8	536	23.5	2.71	1.15
9	E- research reports	577	25.3	671	29.4	389	17.0	648	28.4	2.52	1.15
10	E-bibliographic databases	317	13.9	727	31.8	464	20.3	777	34.0	2.26	1.07
11	E-maps	279	12.2	684	29.9	540	23.0	782	34.2	2.20	1.04
12	CDROM	386	16.9	751	32.9	376	16.5	772	33.8	2.33	1.11
13	E-reference sources (dictionary etc.)	365	16.0	708	31.0	519	22.7	693	30.3	2.33	1.07
14	E-tutorials	454	19.9	732	32.0	363	15.9	736	32.2	2.40	1.13
15	Online databases	386	16.9	741	32.4	451	19.7	707	30.9	2.35	1.09
16	Other electronic databases	339	14.8	711	31.1	581	25.4	647	28.3	2.32	1.04
										Weighted Average =2.45	

Table 5 revealed that the postgraduate students frequently used only five of the 16 e-resources listed. These were e-journals ($\overline{x}$ = 2.77), e-mail ($\overline{x}$ = 2.71), e-newspaper ($\overline{x}$=2.64), e-magazine ($\overline{x}$ = 2.53) and e-research reports ($\overline{x}$ = 2.52). They do not use all the 11 other e-resources to any appreciable extent. The weighted average of 2.45 summarises the results to the effect that the postgraduate students' frequency of use of e-resources was low.

This study found out that the result of the postgraduate students' frequency of use of e-resources was low. This finding is not encouraging to the university libraries and librarians who spent fortunes to subscribe e-resources for use to their researchers. The result indicated that out of the listed e-resources expected to be available in any university library; only five (5) were

frequently used. These are e-journals, e-mail, e-newspaper, e-magazine and e-research reports. The frequencies of the use of e-resources range from daily to occasionally. The postgraduates do not use the other 11 e-resources to any appreciable extent. Among the most used e-resources, majority of the respondents used them once a week and occasionally. Only few respondents used e-resources daily. This finding is in agreement with those of Ojo and Akande (2005) who surveyed postgraduate medical students of University College Ibadan (UCH) and revealed that the students' frequency of use of e-resources was low. In addition, Okiki and Asiru (2011) reported that postgraduate students from the Universities of Lagos, Ibadan and Ife used e-resources daily, weekly, monthly and occasionally. But that the breakdown generally revealed low frequency of e-resources use by the postgraduate students of the three universities.

This low frequency of use of e-resources by the postgraduates is somehow beyond belief because most of the students had reasonable user education and medium computer literacy levels. The five e-resources frequently used are expected because worldwide postgraduate students used them for scholastic activities. However, the other e-resources are supposed to be put to use by the students based on their levels of user education and medium computer literacy level. Perhaps, awareness to such e-resources was not given to the students. And even if awareness was given to them, they were not skilled in the use of the 11 e-resources. It was, however, revealed that use of e-resources is not up to the worth in comparison to investments made in acquiring these resources.

Research Question 6: What is the relative contribution of user education, computer literacy and ICT accessibility on the postgraduates' use of e-resources?

Table 4.15 analysed the relative contributions of the three factors to postgraduate students' use of library e-resources.

Table 6: Relative Contributions of the Three Factors to Use of E-resources

Factors	Unstandardised Coefficients		Standardised Coefficients	Rank	T	Sig.
	B	Std. Error	Beta			
(Constant)	6.43	0.820			7.837	0.000
User Education	3.59E-02	0.090	0.056	3rd	9.963	0.000
Computer Literacy	-4.55E-02	0.033	0.064	2nd	2.389	0.000
ICT Accessibility	0.615	0.035	0.819	1st	17.731	0.000

*Note: *significant at p < .05*

It was revealed that ICT accessibility made the highest contribution to use of library e-resources (β = .819; p < .05). This was followed by computer literacy (β = .064; p < .05) while user education made the lowest contribution (β = .056; p < .05). Each of the three factors made significant contributions to use of e-resources; hence, hypothesis four was rejected.

Further analysis of the three independent variables on the dependent variable revealed the relative contributions of the three factors to use of e-resources (Table 6). ICT accessibility made the greatest contribution to use of library e-resources (β = .819; p < .05). This was followed by computer literacy (β = .064; p < .05) while user education made the lowest contribution (β = .056; p < .05). Each of the three factors made significant contributions. This indicates that the postgraduate students' use of library e-resources will be greatly correlated by adequate provision of ICT access in the university libraries. However, if the students had computer literacy skills, it would correlate the use of e-resources in their libraries to a lesser extent than on access to ICT facilities in the libraries.

Also, if they possessed user education, it would correlate the use of e-resources in their libraries but not as influential as ICT accessibility and computer literacy respectively. Nevertheless, for maximum use of e-resources among postgraduate students to enable them undertake systematic researches and other scholarly works, deliberate efforts should be made to make the students possess adequate user education and computer literacy, as well as the provision of sufficient access to modern ICT facilities in their respective university libraries. The finding of this study was in variance with that of Shaquor and Daher (2010), who found out that the students' use of e-resources at An-Najah National University had significant strong positive relationships with the provision of e-resources by the academic institution. It had significant moderate positive relationships with the resources' characteristics and the course requirement,

and had significant weak relationships with the instructor's support and the students' characteristics.

Test of Hypothesis: There is no significant composite influence of user education, computer literacy and ICT accessibility on postgraduate students' use of e-resources.

Table 7 shows the summary of the composite influence of user education, computer literacy and ICT accessibility on postgraduate students' use of e-resources.

Table 7: Summary of Regression of Use of E-resources on User Education, ICT Accessibility and Computer Literacy

R	R Square	Adjusted R Square	Std. Error of the Estimate
.778	.606	.605	8.3974

Table 7 indicated that the three factors, viz: user education, computer literacy and ICT accessibility jointly had strong positive multiple correlation with postgraduate students' use of library e-resources (R = .778). This means that these three factors were quite relevant and also correlate with the students' use of e-resources. Further, the adjusted R Square value of .605 shows that 60.5% of the total variation in use of library e-resources was due to the three factors. The remaining 39.5% was due to other factors not investigated in this study as well as residuals. This finding was tested for significance in Table 8, and it was found to be significant.

From Table 8, the R value of .778 earlier obtained was found to be significant ($F(3, 2281) = 1168.04$; $p < .05$). Hence, the R value was not due to chance (Table 9).

Table 8: ANOVA Table for the Regression

Model	Sum of Squares	Df	Mean Square	F	Sig.p
Regression	247097.34	3	82365.781	1168.040	.000*
Residual	160847.53	2281	70.516		
Total	407944.87	2284			

*Significant at $p < .05$

The analysis of the regression of the three independent factors on the dependent variable implies that if the postgraduate students possessed user education, computer literacy and had access to ICT facilities in their libraries, then these factors would greatly influence the use of e-resources for their scholastic activities. This will produce sound and competent graduates for Nigeria's socio-economic activities and subsequent development for the country. This result is not in agreement with that of Torma and Vakkari (2004) who revealed from their study at Finnish National Electronic Library that although several studies have been carried out on e-resources use in libraries, they did not show how the different factors (discipline and availability of e-resources) interplay with the use of e-resources.

Conclusion

The use of e-resources by postgraduates is crucial for their scholarly endeavours; this will ground them for future research work. E-resources were provided by the university libraries for the postgraduate scholastic activities, but were not adequately put to use. The study showed that the e-resources provided for the postgraduates' scholastic activities were not fully utilised due to lack of ICT access in the library and inadequate computer literacy of the students. Therefore, the lack of ICT access and inadequate computer literacy are viewed as impediments to the use of e-resources by the postgraduates. If ICT access are increased and deliberate computer literacy education is provided, the use of e-resources will increase with corresponding increase in the postgraduates development as future researchers.

Contribution to Knowledge

This study has established from literature that the independent variable had had influence on postgraduate students' ability to locate, retrieve and use e-resources. However, none of the literature has shown the joint influence of these three variables. Therefore, this study has contributed evidently to literature of the composite influence of user education, computer literacy and accessibility to ICT facilities on retrieval of e-resources from an information system within a social system especially the postgraduate students. The study also contributed in the area of policy statement that should be enshrine in the university libraries policy documents: 'that there must be wide access to ICT facilities for users (postgraduate students), and conscious efforts be made to providing them, in addition to staging computer literacy test for new entrant

postgraduate students with the view to making them be computer-literates. Further, adequate and sustained user education programme should be given to all fresh postgraduate students. Policy statements in these regards could influence use of e-resources and probably improve the postgraduate student's academic research activities and performance. In addition to justify the money spent in providing e-resources.

The study contributed in the area of library practice. University Librarians should allocate more on budget towards the acquisition and subscription of more e-resources. This will cut budget for print materials and thereby creating space for more ICT facilities. It has also shown the need for sustenance of user education programme in all the university libraries for postgraduate students. This study further contributed in the area of the theory used, that is Technology Acceptance Model 2 (TAM2) as theoretical framework. Basically, the model is designed to measure the relative importance of a giving social system such as postgraduate student's perceptions of the systems' usefulness and ease of use in their adoption behaviour. However, TAM2 suggests that other facilitating conditions/ external variables can have significant influence on any group of social system e.g postgraduate students in university libraries. This study uniquely established using facilitating factors – user education, computer literary and ICT accessibility to contribute up to 60.5% in the ability of postgraduate students to retrieve e-resources from their libraries for their research and other scholastic activities. Hence the other 39.5% could be due to other factors not investigated in this study and the residual.

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