



Assessing Different Electronic Resources and their Functional Status for Effective Research Promotion in University Libraries

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Abstract

Purpose: *The objective of this study was to assess the different electronic resources and their functional status for effective research promotion in University libraries.*

Design/Method/Approach: *Data were collected by personal observation of the ten studied institution libraries using the observation checklist. Semi-structured interview schedule was also used in collecting necessary data. Data generated in the observation checklist were analyzed using frequency counts and percentages.*

Findings: *Some of the identified electronic resources in this study are either in use (functional), not in use (available and not functional) or not available. A good number of challenges that impede electronic collection procedures and management practices were identified.*

Originality/Value: *This study has been able to provide an insight on the different types of electronic resources and their functional status in the studied institution libraries. Academic libraries in Nigeria and other developing countries may use the results of this study to identify grey areas in their electronic collection procedures and management practices.*

Keywords: Electronic resources, Research promotion, Academic libraries, Management practices, Electronic collection procedure.

Introduction

University libraries are known to provide quality information service and knowledge products in both print and electronic to the teeming population of lecturers, students (undergraduates and postgraduates), research fellows and other scholars who engage themselves in different research activities in universities. Research per se plays a significant role in the growth and development of any nation and that is why the society continues to call on government of developing nations to fund research in universities. From a personal view point the word “research” is a form of academic investigation that is derived from an idea aimed at finding a solution to an existing problem. Devin (2017) defined research as “a careful and detailed study into a specific problem, concern, or issue using the scientific method”. Almost always, local and international journals as well as Elsevier and Springer books publish novel research works of university lecturers and research fellows.

Electronic collection or resources ought to be managed by librarians working in university libraries through proper planning, organization, maintenance and control of these resources so as to ensure easy access to lecturers, students and research fellows who use these materials for their research activities. Electronic resources, computers, digital media such as library websites, different databases, digital repositories, etc, are some of the necessary promotional tools used in public university libraries for effective research promotion (Zhixian, 2016).

Academic libraries all over the world are striving for electronic collections of journals and other information resources which their teeming population of lecturers and students try to have access to via their personal or university computers (Shirley and Jennifer, 2007). In other to



meet up with the emerging technologies in university libraries, some of the academic libraries are now shifting towards new media-namely electronic resources for their collection management practices in other to satisfy the information needs of lecturers and students who are always consulting these libraries for their research works.

Public university libraries in digital environment is basically a computer based system meant for acquisition, storage, organization, searching and distribution of digital or electronic resources or materials to users. Michael (1999) emphasized that daily management of electronic resources by library staff in university libraries is riddled with enormous opportunities and challenges. Electronic resources are those materials that require computer access; whether through a personal computer, mainframe, or handheld mobile device. Some of the most frequently encountered types of electronic resources include: Electronic journals, Electronic books, Full-text databases, Indexing and abstracting databases, Reference databases (biographies, dictionaries, directories, encyclopaedias, etc.), Numeric and statistical databases, Electronic images and Electronic audio/visual resources.

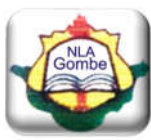
It is not uncommon to observe in some university libraries in Nigeria that there is no computerization of library collection materials. The Integrated Library Software Package (TINLIB) came into use in leading academic libraries (University of Nigeria, Nsukka; University of Ibadan; and Ahmadu Bello University, Zaria) in Nigeria in the 90s but owing to some technical and organizational problems, most of the university libraries in Nigeria, especially in the South East Area of Nigeria are not using TINLIB software today (Omoniwa, 2001). However, the emergence of electronic information resources has been transforming information-handling and management practices in Nigerian academic environment and university libraries in particular (Ani and Ahiauzu, 2008). Some of these observed changes are reflected in the way electronic information resources are provided to a particular university community.

University libraries in South East, Nigeria are making effort to embrace ICT for better electronic information service delivery to their lecturers, students and researchers, especially now that most libraries in developed and developing countries are undergoing tremendous transformation in areas of electronic collection development and management practices for effective research promotion. However, one cannot ascertain the different electronic resources in university libraries in South East, Nigeria as well as their functional status. It is against this background that this study was set to assess the different electronic resources and their functional status for effective research promotion in public university libraries in South East, Nigeria.

Statement of the Problem

There is no doubt that good and efficient electronic collection procedure is not only paramount in university libraries but also promote research activities. Furthermore, easy access of electronic resources from academic libraries by the teeming population of lecturers, students and research fellows facilitates and promotes research activities. University libraries strive to promote the use of electronic resources by its clientele via adequate and efficient electronic collection management procedures and practices.

It is common knowledge that standardized university libraries that are equipped with trained librarians and para-professionals are of paramount importance in promoting research activities in the universities. Some academic libraries in South East, Nigeria may or may not have adequate electronic collection to support and promote research activities. Sometimes, inability of lecturers, students and research fellows to satisfy their respective information needs for their



research activities may affect their research output and productivity. For that reason, there is need for university libraries to think ahead and fashion out strategies and procedures that would help to build on their electronic collection for effective teaching, learning and research promotion. The present study becomes necessary to assess and ascertain the availability and functional status of electronic collection resources in ten (10) public university libraries in South East, Nigeria.

Objectives

The purpose of this study was to assess the different electronic resources and their functional status for effective research promotion in public university libraries in South East, Nigeria. The specific objectives of the study were to:

- Identify the types of electronic collection resources available in the ten public university libraries in South East, Nigeria.
- Assess the functional status of the identified electronic collection resources in the ten public university libraries in South East, Nigeria.
- Identify the existing challenges associated with electronic collection procedures and practices in the ten public university libraries in South East, Nigeria.
- Proffer necessary solutions on how to enhance electronic collection management practices for effective research promotion in public university libraries in South East, Nigeria.

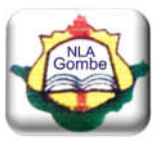
Literature review

There are myriads of journal articles on management of electronic collection resources in different institutions and organizations (Adebayo et al., 2018; Ameen and Haider, 2007; Bothmann and Holmberg, 2008; Carolina and Angel, 2009; Christopher, 2015). However, the literature review for the present study hinges on the findings of research works of other scholars that are related to assessment and management of electronic collection resources for effective research promotion in university libraries.

The work of Ifijeh, Ogbomo and Ifijeh (2018), titled "Utilization of Academic Library Resources for Research Productivity among Lecturers in Private University in South-South, Nigeria" is another related study. The purpose of the study was to investigate the nexus (connection) between utilization of library resources and research productivity of lecturers in Private Universities in South-South, Nigeria. The study adopted descriptive research design. The population of the study was 1,841 private university lecturers with a sample size of 368. A self-constructed questionnaire served as the main instrument for data collection. Data generated from the study were analyzed using mean, median and t-test statistics. The Pearson Product Moment Correlation Coefficient (PPMCC) was employed in testing the hypothesis.

Major findings from this study indicated that lecturers access library resources for their teaching and research. However, the study further revealed that factors such as work pressure, time constraints among others were identified as the lecturers' challenges in accessing library resources. The study posited that lecturers' research productivity level was average (publication rate of 1-5 times in three years). The reviewed study recommended university management to invest more on acquisition of information resources for libraries and also ensure that more lecturers are employed in order to reduce the work pressure and load on lecturers.

In another related study, Okiki and Olatokunbo, (2018), did a work titled "Management of Electronic Books in Nigerian University Libraries. The study was conducted in three first generation universities in South West, Nigeria: University of Ibadan, Ibadan; University of Lagos, Lagos and Obafemi Awolowo University, Ile-Ife. The purpose of the study was to verify



or determine the processes involved in the management of electronic books (e-books) in the university libraries. The study adopted mixed method technique to elicit data from both librarians and undergraduate students. The sample size was 721 which is 10% of the population size of the study. Questionnaire served as the main instrument for the study. Qualitative data from the study were analyzed using the thematic analysis technique.

The major findings from this study revealed that Nigerian university libraries have embraced electronic books subscription. The study further stated that relevance of electronic books to subjects offered in the universities were the guiding principle when subscribing to electronic book databases. The study recommended that university librarians in Nigerian university libraries should subscribe to electronic books with user friendly interface. It also recommended for increase in funding from the different university management.

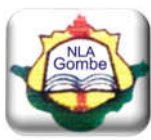
A study by Asante, Akussah and Adu-Sarkode (2015), titled “Impact of Electronic Resources and Usage in Academic Libraries in Ghana: Evidence from Koforidua Polytechnic and All Nations University College, Ghana” utilized a quantitative approach by the use of questionnaire to collect information pertaining the use of electronic resources, frequency of use of electronic resources, purpose of using electronic resources, frequency of locating desired information and problems faced by users while using electronic resources. The questions had multiple choice answers that the respondents ticked. A total of 260 questionnaires were distributed to collect the primary data and 152 were found useable representing 58.5% of the sample size. Data collected from the study were analyzed using coefficient correlation and F-ration.

Major findings from this study showed that all the four contracts (satisfaction level, preferred database, time and frequency, and level of awareness) of impact of electronic resources had a significant positive relationship with usage among the users. It was recommended that intensive marketing strategies be adopted to increase the use of electronic resources in Ghanaian academic institutions.

The work of Okite-Amughoro, Makgahlela and Bopape 2015, examined the use of electronic information resources for academic research by postgraduate students at Delta State University, Abraka. The purpose of the study was to investigate the level of awareness and knowledge regarding electronic information resources among postgraduate students as well as the frequency of usage of electronic information resources by the same category of students. Quantitative and qualitative research approaches were employed in executing the study. A total of 720 postgraduate students at Delta State University represented the study population. The study employed a sample size of 150 postgraduate students from the faculties of Science, Social Sciences and Arts (50 students per faculty). Questionnaire and interview schedule were the major instruments for data collection. A total of 10 respondents (2 system librarians and 8 other librarians) were interviewed. Data generated from the study were analyzed using simple descriptive percentages.

The major findings revealed that postgraduate students had more access to online journals which accounted for 93%. A total of 107 (71%) respondents indicated that their knowledge of electronic information resources is/was to some extent and 41 (27%) respondents stated that their knowledge of electronic information resources is/was to a large extent. The study recommended for orientation and training of academic staff, postgraduate students and librarians on the use of electronic resources.

Another study conducted by Omotunde *et al.* (2014), “titled Utilization of Library Resources for Effective Research Output among Postgraduate Ministerial Students of Adventist University of Africa in Babcock University” was reviewed. Area of study is Adventist



University of Africa in Babcock University. The purpose of the study was to investigate utilization of library resources for effective research output by postgraduate ministerial students of Adventist University of Africa in Babcock University. The study adopted the survey design method. The population size and sample size were of the same size since the study indicated that all the 51 postgraduate students of Babcock University were sampled. The questionnaire served as the main instrument for data collection. The researchers made use of descriptive statistic for data analysis using Statistical Package for Social Sciences (SPSS)..

Findings from this study clearly shows that the most frequently used library materials were the online database, dictionaries, books (electronic books) and encyclopedias while the least used material was CD-ROM database. The study recommended that university libraries in Nigeria should always evaluate the quality, adequacy and use of their library information resources and services for a better and more efficient provision of library services to users.

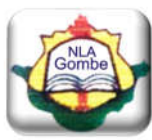
Iroaganachi and Izuagbe, (2018), did a study titled “A Comparative Analysis of the Impact of Electronic Information Resources Use towards Research Productivity of Academic Staff in Nigerian Universities”. The purpose of the study was to compare and analyze the effect of electronic information resources use on academic staff research productivity in selected federal, state and private universities in South West, Nigeria. The study made use of survey design of correlational type. Multi-stage sampling procedure was used as a result of the fact that the study planned to do multiple selections of samples from the population size that comprised federal, state and private universities in the South West geopolitical zone of Nigeria. The total population of the study stood at 3,339 and 10% of this figure was chosen as the sample size for the study. Structured questionnaire served as the instrument for data collection. Data generated from the study were analyzed using Statistical Package for the Social Sciences (SPSS).

The findings emanating from the reviewed study revealed that the greatest motivation for academic staff to use EIR is the ability of EIR to facilitate the accomplishment of their research task more quickly. Google scholar, Springer Link, Emerald, MyLibrary were identified as the most utilized EIRs databases by academic by academic staff for research. The study also pointed out that EIRs use has had significant impact on academic staff research productivity in so many ways such as: improving the quality of discussions at workshops, conferences and symposia; enhancing community service participation, improving research publications etc.

The study recommends management of federal and state universities to create training and development platforms for acquisition of media and digital skills needed for maximum exploitation of EIRs for quality research. The study also advocated for intensified efforts from the management of academic libraries in Nigeria for efficient user orientation programme for academic staff as a way of promoting research activities.

Methodology

The study adopted the descriptive survey design where observation checklist and semi-structured interview schedule were used to collect the desired data. The study was centred in ten public university libraries in South East, Nigeria and these universities include: Michael Okpara University of Agriculture, Umudike (MOUUAU) and Abia State University (ABSU) in Abia State; Nnamdi Azikiwe University (NAU) and Chukwuemeka Odimegwu Ojukwu University (COOU) in Anambra State; Alex Ekwueme Federal University Ndufu-Alike (AE-FUNAI) and Ebonyi State University (EBSU) in Ebonyi State; University of Nigeria, Nsukka (UNN) and Enugu State University of Technology (ESUT) in Enugu State; Federal University of Technology Owerri (FUTO) and Imo State University (IMSU) in Imo State. A total of thirty-



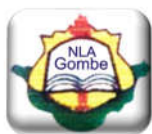
seven (37) electronic resources (see the Appendix A for details) were listed in the first part of the observation checklist with each item having spaces where the research on her visit to the studied institution libraries could indicate or mark “AF (Available and Functional)”, “ANF (Available and Not Functional)” or “NA (Not Available)” against the listed electronic resources.

The second part of the observation checklist (see Appendix B for details) contained numbers of available computers and spaces for the researcher to indicate the observed number of computers in the studied university libraries. The researcher personally visited each of the ten studied university libraries in South East, Nigeria and painstakingly observed and recorded in the observation checklist the available electronic resources and their current functional status and the number of available computers in these libraries. In the same vein, the researcher administered the semi-structured interview schedule to the cataloguing librarian, electronic reference librarian, acquisition librarian and digital librarian in the ten studied institution libraries. The interviewees were meant to provide answers in the spaces provided under each of the five (5) questions raised in the semi-structured interview schedule. Data generated in the observation checklist were analyzed using frequency counts and percentages. Number of available computers in the 10 public university libraries was analyzed using the bar chart.

Results

Table 1: Percentage scores on types of electronic collection resources and their functional status in 10 public university libraries in South East, Nigeria

	AF (Available and Functional)	ANF (Available and Not Functional)	NA(Not Available)	Decisio n
Internet	9(90%)	1(10%)	0(0%)	AF
Online Public Access Catalogue (OPAC)	5(50%)	4(40%)	1(10%)	AF
Indexing and abstracting databases	8(80%)	0(0%)	2(20%)	AF
Full-text databases	7(70%)	2(20%)	1(10%)	AF
Reference databases	6(60%)	2(20%)	2(20%)	AF
Numeric and statistical databases	6(60%)	1(10%)	3(30%)	AF
Electronic images	6(60%)	4(40%)	0(0%)	AF
Electronic and audio/visual resources	4(40%)	5(50%)	1(10%)	NA
BLISS (Bilkent Library Information Services System)-A database for construction industries	1(10%)	2(20%)	7(70%)	NA
BIOSIS PREVIEW (Bioscience Information Service Preview)-A database for life sciences	2(20%)	0(0%)	8(80%)	NA
Africa Bibliography	3(30%)	2(20%)	5(50%)	NA
ADS-Astrophysics Data System	1(10%)	1(10%)	8(80%)	NA
Networked computers	8(80%)	2(20%)	0(0%)	AF
Stand alone computers	8(80%)	2(20%)	0(0%)	AF
CD-ROM-Compact Disc Read Only Memory	9(90%)	1(10%)	0(0%)	AF
EBSCO databases (Elton Bryson Stephens Co)	5(50%)	4(40%)	1(10%)	AF
EMERALD databases	2(20%)	4(40%)	4(40%)	NA
Library software eg SLAM (Simultaneous Localization and Mapping), TINLIB (The Information Navigator Library software), GLAS (Graphical Library Automation System), X- LIB (LibX11 software), and CDS-ISIS (Computerized Documentation Service/Integrated Set of Information Systems).	2(20%)	4(40%)	4(40%)	NA
Electronic Journals	9(90%)	1(10%)	0(0%)	AF
Electronic books	9(90%)	1(10%)	0(0%)	AF
E-mail	10(100%)	0(0%)	0(0%)	AF
Websites	10(100%)	0(0%)	0(0%)	AF
Google Scholar	10(100%)	0(0%)	0(0%)	AF
AGORA (Access to Global Online Research in Agriculture)	8(80%)	2(20%)	0(0%)	AF
Science Direct	8(80%)	1(10%)	1(10%)	AF
KOHA (This is an open source Integrated Library System (ILS) “KOHA” is a term used by indigenous “Maori” people of New Zealand for “gift” or “donation”).	5(50%)	2(20%)	3(30%)	AF
HINARI (Health Internet Network Access to Research Initiative)	10(100%)	0(0%)	0(0%)	AF



OARE (Online Access to Research in the Environment)	9(90%)	0(0%)	1(10%)	AF
My library	3(30%)	3(30%)	4(40%)	NA
ProQuest database	4(40%)	2(20%)	4(40%)	NA
Web of Science	7(70%)	2(20%)	1(10%)	AF
LISTA database (Library Information Science and Technology Abstract)	2(20%)	4(40%)	4(40%)	NA
JSTOR database (Journal Storage database)	8(80%)	0(0%)	2(20%)	AF
SCOPUS (A bibliographic database containing abstract and citations)	3(30%)	3(30%)	4(40%)	NA
IEEE database (Institute of Electrical and Electronic Engineering database)	4(40%)	2(20%)	4(40%)	NA
Wikipedia (The free Online encyclopedia)	9(90%)	0(0%)	1(10%)	AF
WESTLAW (An Online research service dealing with law materials and related law articles)	3(30%)	1(10%)	6(60%)	NA
NUC Virtual library (National Universities Commission Virtual library)	5(50%)	3(30%)	2(20%)	AF
TOTAL	228(60%)	68(18%)	84(22%)	

Keys: AF = Available and functional. NA = Not Available ANF = Available Not functional

The results of the different types of electronic collection resources as observed in the ten studied institution libraries in South East, Nigeria are presented in Table 1. Electronic mail system (E-mail), Websites, Google Scholars and HINARI (Health Internet Network Access to Research) are available and functional in the ten public university libraries. Nine out of the ten public university libraries have functional Internet system, CD-ROM (Compact Disc Read Only Memory), Electronic journals, Electronic books, OARE (Online Access to research in the Environment) and Wikipedia (the free online encyclopedia).

Eight of the ten public university libraries were observed to have functional Indexing and abstracting databases, Networked computers, Stand alone computers, AGORA (Access to Global Online Research in Agriculture), Science Direct and JASTOR database (journal storage database) electronic collection resources. Seven of the public university libraries operate functional full-text database and web of science.

As shown in Table 1 there is evidence of the availability and functionality of reference databases, numeric and statistical databases as well as electronic images in six of the public university libraries. Online Public Access Catalogue (OPAC), EBSCO database (Elton Bryson Stephen Co), KOHA (an open source integrated library system) and NUC virtual library (National Universities Commission Virtual Library) were identified and observed in five public university libraries. Electronic and audio/visual resources, PreQuest database and IEEE database (Institute of Electrical and Electronic Engineering database) were identified and recorded for four public university libraries in the observation checklist.

African bibliography, My library, SCOPUS (a bibliographic database that contains abstract and citations) and WESTLAW (an online research service dealing with law materials and related law articles) were observed to be available and functional in three of the ten public university libraries studied. Electronic collection resources such as BIOSIS PREVIEW (Bioscience Information Service Preview-A database for life science), EMERALD database (Electronic Management Research Library Database), library software eg SLAM (Simultaneous Localization and Mapping); TINLIB (The Information Navigator Library Software); GLAS (Graphical Library Automation System); X-LIB (LibXII Software); and CD-ISIS (Computerized Documentation Service/Integrated set of Information System) and LISTA database (Library Information Science and Technology Abstract) were identified and observed to be functional in only two of the ten public university libraries. The BLISS (Bilkent Library Information Service System-A database for construction industries) and ADS (Astrophysics

Data System) were identified and observed to be functional in only one of the institution libraries studied.

Number of available computers in the 10 public university libraries as recorded in the observation checklist

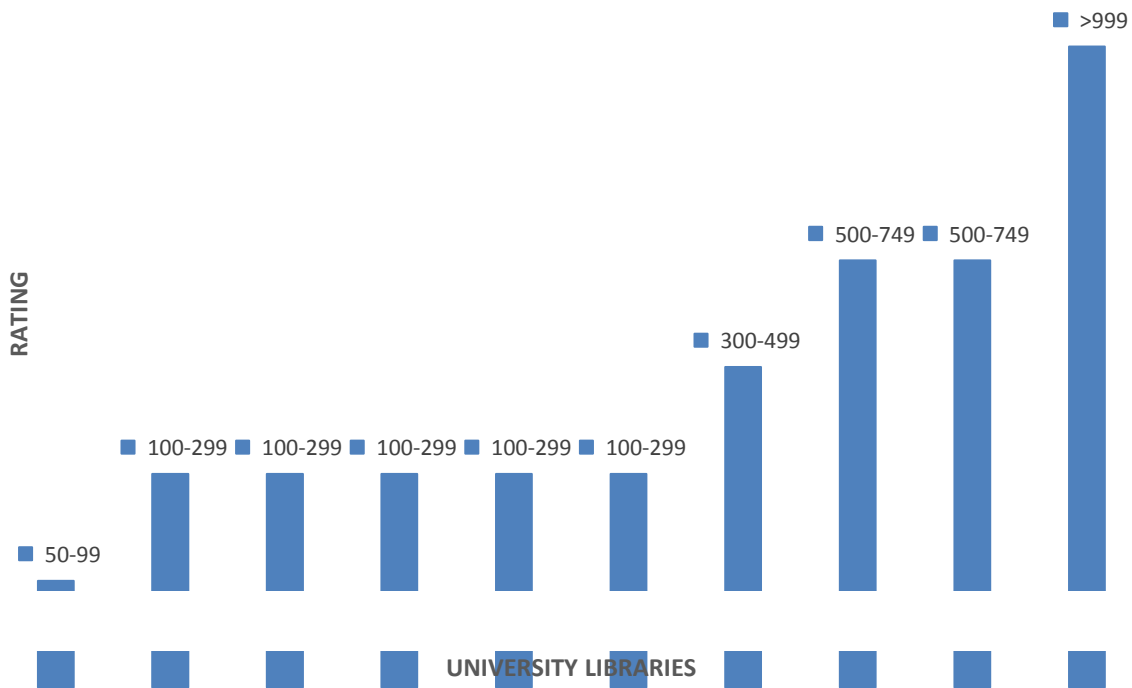
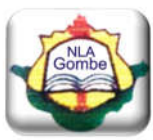


Figure 1: Bar chart distribution of number of computers in 10 Public University libraries in South East, Nigeria

The bar chart graph in figure 1 shows that one university library has more than 50 computers while more than 100 computers were observed in five of the ten university libraries. More than 300 computers were identified in one university library while there were more than 500 computers in two of the university libraries. Only one university library recorded more than 900 computers.

The first question from the semi-structured interview sought the interviewees to state the major electronic resources in their University libraries that lecturers, students and researchers access for their research activities. The interviewees listed the following as the major electronic resources/databases accessed by lecturers, students and researchers in their university libraries for their research activities: “JASTOR (Journal Storage)”, “EBSCOHOST (Elton B Stephens Co-An Online Research Database Initiative)”, “Research for life”, “CD-ROM (Compact Disc Read Only Memory)”, “Electronic Journals”, “Electronic Books”, “Adobe Acrobat Document (Pdf-Printed Document Format)”, “Online Newspapers”, “Electronic reference resources”, “Video, image and sound resources”; “Desktop and laptop computers”, “Academic portal/library portal”, “Institutional repositories”, “Electronic theses and electronic dissertations”, “AGORA (Access to Global Online Research in Agriculture)”, “Science Direct”, “ProQuest” and “HINARI (Health Internetwork Access to Research Initiative)”. The electronic resources enumerated by the interviewees are similar to the findings from the observation checklist.

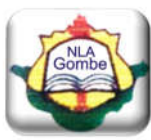


The second question from the semi-structured interview schedule sought to find out from the four interviewees what they consider as areas of research promotion using electronic collection resources in their University libraries. The following answers were provided by the interviewees as areas of research promotion using electronic resources: “Development of electronic research collection”, “Provision of functional ICT”, Organising workshops, seminars for both professional librarians and para-professionals”, “Encouraging participatory research by connecting researcher, students and lecturers in University research activities”, “Provision of research forum”, “Ensuring that staff register in Research gate platform to become visible”, “Provision of wireless Internet connectivity”, “Provision of ORCID (Open Research Contributor ID)”, “Accessibility (electronic resources have promoted research in area of their being easily accessed by researchers, students and lecturers”, “These resources (E-resources) have also promoted research in area of time saving for users” and “Electronic resources equally promote visibility of research materials to students, lecturers and researchers”.

The third question posed to the interviewees was to know how electronic collection management practice in their university libraries can contribute to research promotion. The following answers were provided: “Through electronic collection management practice, steady subscription to full-text electronic journals will be able to complement conventional journals and in this way can aid or contribute to research promotion”, “Through efficient electronic collection management practice, subscription to electronic books in various disciplines will be able to help in teaching and research and in this way can help or contribute in research promotion”, “Through efficient electronic collection management practice, different databases are made available to students, lecturers and researchers for effective research promotion”, “Electronic collection management practices provide unlimited access of electronic information resources to students, lecturers, and researchers and in this way aid or contribute to research promotion” and “Electronic collection management practices tend to provide access to timely and current information to students, lecturers and researchers for their research activities and in that way aid or contribute in promoting research”.

In the fourth semi-structured schedule interview question, the interviewees were asked to briefly mention some of the challenges associated with electronic collection management practices in their University libraries. The interviewees enumerated the following challenges: “Lack of adequate funds to maintain subscription for different electronic resources/databases”, “Limited ICT staff”, “Underfunding of electronic collections in Public University libraries”, “Some of the Public University libraries are not automated”, “Poor electricity power supply to Universities and their libraries”, “Lack of technical knowhow”, “Incompetent library personnel” “Lack of adequate tools and materials for proper preservation, storage and retrieval of electronic resources”, “Bad attitude of library users and few staff”, “Low internet bandwidth”, “Lack of functional institutional repositories”, “Lack of adequate electronic management policies”, “Some of the computers in Public University libraries are not in good working conditions”, “Obsolescence of computer system in some University libraries” and “Most of the library users do not have impressive dexterity when they use the computers keyboards/mouse pads/mouse mat”.

The fifth question wanted to know from the interviewees how the challenges they have stated could be tackled to bring about a more robust and efficient electronic collection procedure and management practice that will augur for effective research promotion in their different University libraries. The following answers were provided by the interviewees: “Computerization/full automation of Public University libraries”, “Provision of adequate funds



by the federal and state governments for efficient electronic collection management practices in Public University libraries”, “Need for provision of skilled manpower”, “Proper re-orientation of the mindset of library staff and users”, “Subscription to relevant online databases/electronic resources”, “Improving the Internet bandwidth in Public University libraries”, and “Constant training and re-training of Public University library staff in ICT”.

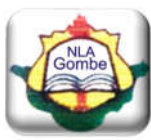
Discussion

Personal observation of these libraries revealed myriads of different electronic collection resources in their different functional status (Table 1). All the ten studied Public University libraries have functional Electronic Mail system (E-Mail), Websites, Google Scholar search engine and HINARI (Health Internet Network Access to Research database) which they use for research promotion. Availability of functional electronic collection resources in University libraries will always impart positively on students, lecturers and other researchers as they access and use these electronic resources for learning, teaching and research activities. Electronic collection resources in University libraries are seen as essential research tools that complement the print-based resources in these libraries (Dadzie, 2005). This assertion lends credence to the argument that students, lecturers and researchers need different types of databases for their studies and research promotion.

Functional Internet system, CD-ROM (Compact Disc Read Only Memory), Electronic journals, Electronic books, OARE (Online Access to Research in the Environment) and Wikipedia were observed in nine of the studied Public University libraries. Sadeh and Ellingsen (2005) were of the opinion that an electronic resource can come in form of a package of electronic journals, electronic books or database of abstracts, and indexes that include the full-text of some or all articles referenced by the indexes. When University libraries have a wide array of electronic collection resources, researchers and other library users tend to derive a lot of benefits, ranging from gaining access to a wide variety of information to improved research output and academic performance (Okello-Obura and Magara, 2008).

From the result of the observation check list, eight of the Public University libraries were observed to have the following electronic collection resources in their full functional status: Indexing and abstracting databases, Networked computers, Stand alone computers, AGORA (Access to Global Online Research in Agriculture), Science Direct and JSTOR (Journal storage database). Networked computers and Standalone computers are grouped as Networked electronic information resources (NEIR) (Seema, 2008). Networked computers and standalone computers are known as computer networks used in automated or electronic libraries to support many applications and services eg access to World Wide Web, digital video, digital audio, storage servers, printers, fax machines etc (*Encyclopaedia Britannica*, 2020). All these electronic devices are used in managing electronic collection resources for effective research promotion in University libraries.

From this study, some electronic collection resources were observed to be either absent or not functional in some of the Public University libraries studied. It has always been the case in some Nigerian University libraries, to witness either absence or underutilization of the technical tools that will drive efficient electronic collection management practice for research promotion. According to Obajemu and Ibegwam (2006), information providers such as Public University libraries ought to have knowledge of general computing and also high level of proficiency in library software and accessories that come to their libraries. Obviously, facilities for efficient electronic collection management practice for research promotion revolve around library automation. These facilities include things like computer systems, network cables, good



internet bandwidth, printers that should be connected to computers, functional telephone lines, Internet system, Fax and scanning machines. Among all these facilities, human personnel in areas of computer experts in programming, web designers, programme analysts and other technical staff are very important.

It is interesting to know that it was Baro (2014) that kick started acquisition of computers and related Information Communication Technologies for automated services with computers donated from National Universities Commission (NUC) between 1995 and 1999. It was at this period that most of the University libraries in Nigeria started subscribing to electronic software to boost their electronic collection management practices. Different electronic collection software were observed in some of the studied Public University libraries, either in good functional state or non functional state or never existed at all.

Distribution of the number of computers in the ten public university libraries as recorded in the bar chart (figure 1) revealed that five of these universities have more than one hundred computers (100-299) in their libraries. Two of the public university libraries have 50-99 computers and 300-499 computers respectively while the number of computers in another two public university libraries ranges from 500-749. Only one Public University library can boast of more than 900 computers.

The importance of computers in electronic collection management practice for effective research promotion cannot be overemphasized. Library automation is viewed as an integral part of all the efforts which libraries, especially University libraries direct towards the utilization of computers and networking technologies (Emasealu, 2019). Shi (2015) asserts that traditional library management was no longer feasible to satisfy users' demands for fast, convenient and straightforward information services. The author went on to explain that use of computers and computer technologies in library management have made electronic collection management practices and information searching very easy and efficient. Application of computer technology in Public University library management system will no doubt improve the efficiency of electronic collection and utilization of electronic resources by students, lecturers and other researchers and in this way aid research promotion.

Since four (40%) of these libraries have reasonable number of computers for their teeming population of students, lecturers and researchers for easy access and use of electronic resources for their research activities, it is imperative for the library management to ensure that its hardware is adequate to handle the demands of the server. Christenson (2014) posited that any Web server that handles many Web scripts in real time is supposed to be equipped with a fast running processor and a good Random Access Memory (RAM) to handle the "load" so as not to slow down whenever users access the websites or electronic resources or download articles at the same time. More so, a file server ought to have one or more fast hard drives which will be able to read and write data quickly.

The findings of this study from the semi-structured interview schedule view point in area of research promotion using electronic collection resources are in agreement with Garner (2006) who revealed that the academic library at Curtin University in Australia aims proactively to support and promote research by providing relevant resources, strengthening research processes, facilitating scholarly communication and promoting research output.

In the same manner, findings from the semi-structured interview schedule on how electronic collection management practice contribute in research promotion are in consonance with the views expressed by some authors in their studies on the use of electronic resources in teaching,



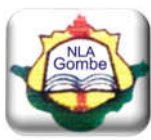
learning and research. Earlier research by Tenopir and King (2007) pointed out that the principal reason for the use of electronic resources by lecturers, students and other scholars in university libraries in United States and Australia is strictly for research promotion. In supporting this assertion, Deng (2010) posited that library users consult electronic resources for different reasons which include: gathering information on a definite topic of study, gaining general information, to get answers to some questions, finding research materials/topics, to complete their assignments, to do literature review work, writing research proposal etc. In the same vein, Shukla and Mishra (2011) were of the opinion that quite a good number of researchers avail themselves the opportunity of using electronic resources for publishing articles in journals and for current and up to date information in their areas of research and specialty.

Some of the challenges of electronic collection procedures and management practices pointed out by the interviewees are not different from the findings of Carolina and Angel (2009) who in their studies revealed that organizational (eg inadequate existing UCT strategy, lack of adequate budget/fund, erratic or epileptic electricity power supply, etc); cultural (eg academic librarian reluctance to use ICT, difficulty in training the academic librarian/paraprofessionals etc) and human factors (eg lack of ICT qualified staff/personnel, skill level of academic librarians) are necessary factors that can affect the use of ICTs in relation to management of electronic resources.

The findings from semi-structured interview schedule on the ways of tackling the challenges of electronic collection procedures and management practices in academic libraries reflect the points made in the study by Haliso (2011) which stressed on proper training of library staff in area of Information and Communication Technology for proper skill acquisition on how to manage electronic collection resources. The training of library staff can come in different forms but the most important form of training is on the job type of training which is highly cost effective. Whenever there is adequate funding university public libraries in Nigeria should ensure that their staff are sent for training from time to time. In another development, Haliso (2011) did a survey study to show the availability of bandwidth for Internet services in academic libraries in Southwestern Nigeria. In that study, it was revealed that majority of the academic libraries (65.5%) had no separate bandwidth connection for the provision of Internet services to their clientele. This observation from Haliso's work can be ascribed to poor funding of the affected university libraries. Provision of appropriate funds to every university library management will not only help in the procurement of modern ICT facilities but will also facilitate library automation for efficient electronic management practice. Library automation per se involves the application of complexities of ICT in handling the routine library services (Emaasealu, 2019). Benefits of library automation include easy and fast access to online resources and accurate and faster completion of library routine task.

Conclusion

This study has been able to ascertain that there are a variety of electronic resources in university libraries in South East, Nigeria that are either in use (functional), not in use (available and not functional) or not available. In these libraries, electronic resources are accessed by the teeming population of lecturers, students and other scholars for their different academic activities towards research promotion. Management of electronic collection resources in public university libraries in Nigeria revolves around Information and Communication Technology which some of the academic libraries in South East, Nigeria have started embracing for better and efficient information storage and delivery. Through proper application of ICT and good electronic management procedures and practices in university libraries in South East, Nigeria



there is bound to be increased speed in some library operations services eg acquisition, cataloguing and classification, serials, reference, processing, storage, retrieval, bibliographic and dissemination which will invariably help in promoting research.

Recommendation

The study is suggesting the following recommendations as possible avenues of enhancing electronic resources and their functional status for effective research promotion in university libraries in Nigeria.

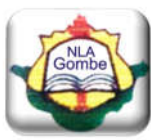
- University library managements and university authorities should work hand in hand to provide relevant electronic resources in university libraries to strengthen research activities.
- There should be proper training of librarians and para-professions working in university libraries for proper skill acquisition on how to manage electronic resources for effective research promotion.
- University libraries should be adequately funded by the State and Federal government.
- Non functional electronic resources in university libraries should be reactivated.
- Students, lecturers and researchers who use academic libraries for their research activities should have access to desktop computers connected to the Internet.

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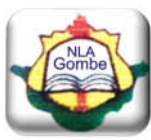


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Author Biographies

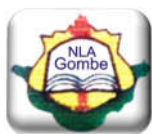
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Appendix A: Observation checklist

S/N	ELECTRONIC RESOURCES	AF (Available and Functional)	ANF (Available and Not Functional)	NA (Not Available)
1	Internet			
2	Online Public Access Catalogue (OPAC)			
3	Indexing and abstracting databases			
4	Full-text databases			
5	Reference databases			
6	Numeric and statistical databases			
7	Electronic images			
8	Electronic and audio/visual resources			
9	BLISS (Bilkent Library Information Services System)-A database for construction industries			
10	BIOSIS PREVIEW (Bioscience Information Service Preview)-A database for life sciences			
11	Africa Bibliography			
12	ADS-Astrophysics Data System			
13	Networked computers			
14	Stand alone computers			
15	CD-ROM-Compact Disc Read Only Memory			
16	EBSCO databases (Elton Bryson Stephens Co)			
17	EMERALD databases			
18	Library software eg SLAM (Simultaneous Localization and Mapping), TINLIB (The Information Navigator Library software), GLAS (Graphical Library Automation System), X-LIB (LibX11 software), and CDS-ISIS (Computerized Documentation Service/Integrated Set of Information Systems).			
19	Electronic Journals			
20	Electronic books			



21	E-mail			
22	Websites			
23	Google Scholar			
24	AGORA (Access to Global Online Research in Agriculture)			
25	Science Direct			
26	KOHA (This is an open source Integrated Library System (ILS) “KOHA” is a term used by indigenous “Maori” people of New Zealand for “gift” or “donation”).			
27	HINARI (Health Internet Network Access to Research Initiative)			
28	OARE (Online Access to Research in the Environment)			
29	My library			
30	ProQuest database			
31	Web of Science			
32	LISTA database (Library Information Science and Technology Abstract)			
33	JSTOR database (Journal Storage database)			
34	SCOPUS (A bibliographic database containing abstract and citations)			
34	IEEE database (Institute of Electrical and Electronic Engineering database)			
35	Wikipedia (The free Online encyclopedia)			
36	WESTLAW (An Online research service dealing with law materials and related law articles)			
37	NUC Virtual library (National Universities Commission Virtual library)			



Appendix B: Number of Available Computers

S/N	NUMBER OF AVAILABLE COMPUTERS	INDICATE AGAINST THE APPROPRIATE COLUMN
1	1000 computers and above	
2	750-999	
3	500-749	
4	300-499	
5	100-299	
6	50-99	
7	Less than 50	

Appendix C: Semi-structured interview schedule

1. What are the major electronic resources in your University library that lecturers, students and other researchers can access for their research activities?

2. What would you consider as areas of research promotion using electronic resources in your University library?

3. How do think electronic collection management practice in your University library can contribute to research promotion?

4 From your own perspective, what are the challenges associated with electronic collection management practices in your University library?

5. How do think these problems or challenges you have pointed out could be tackled to bring about a more robust and efficient electronic collection management practice for effective research promotion in your University library?

