INFORMATION RETRIEVAL SKILLS, PERCEIVED EASE OF USE AND DEMOGRAPHIC VARIABLES AS DETERMINANTS OF UNDERGRADUATES' ELECTRONIC RESOURCES UTILISATION FOR RESEARCH IN NIGERIAN UNIVERSITY LIBRARIES

BY

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A THESIS IN THE DEPARTMENT OF LIBRARY, ARCHIVAL AND INFORMATION STUDIES, SUBMITTED TO THE FACULTY OF EDUCATION IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

OF THE

UNIVERSITY OF IBADAN.

JANUARY 2013

ABSTRACT

There is an increase in provision of electronic resources in Nigerian university libraries, but there is low use of the resources by undergraduates. Some of the students lack information retrieval skills while some do not perceive the e-resources as easy to use. Demographic variables are also known to affect students' use of e-resources but the extent of the effect is yet to be determined. The study, therefore, investigated the extent to which information retrieval skills, perceived ease of use and demographic variables would determine students' utilisation of electronic resources in university libraries in Nigeria.

The descriptive research design of the correlational type was adopted. Multistage sampling technique was used to select ten universities while three faculties were purposively selected from the universities. Two departments each were randomly selected from the faculties. Also, 2,469 fourth year students were selected as sample. A questionnaire, "Information Retrieval Skills and Utilisation of Electronic Resources (IRSUER)": Demographic variables (r=0.85) : Utilisation (r=0.87) : Perceived Ease of Use (r=0.91) : Retrieval skills (r=0.75) and an interview schedule were used. Four research questions were answered and seven hypotheses tested at 0.05 level of significance. Qualitative data were content analysed.

Information retrieval skills (r= 0. 242; P<0.05); operational retrieval skills(r=0.214; P<0.05) and strategic retrieval skills(r=0.353; P<0.05) correlated significantly with students' utilisation of electronic resources for research. Perceived ease of use was found to have significant relationship with students' utilisation of electronic resources (r=0.343; P<0.05). Information retrieval skills and perceived ease of use correlated positively with students' use of electronic resources (r=0.434). Course of study has significant relationship with students' use of e-resources (r=0.052; p<0.05). Students in the humanities were found to use e-resources as much as other students in sciences and social sciences. Perceived ease of use made the highest relative contribution to utilisation of e-resources (β=0.400; P<0.05) followed by strategic retrieval skills (β=0.204; P<0.05). Informational retrieval skills made contribution of (β=0.064; P<0.05) while operational retrieval skills did not have significant relative contribution to students' utilisation of electronic resources. Age and gender did not have significant relationship with students' use of e- resources. Interview result showed that undergraduates lacked requisite skills for the use of e-resources. It also revealed that power failure, lack of funds, insufficient number of staff in the unit and low bandwidth are some of the challenges that impede e-resources use.

Information retrieval skills constitute the most critical factor in undergraduates' use of e-resources. Though the undergraduates are disposed to use of electronic resources' they require capacity building for maximum utilisation. University libraries should therefore educate students on the use of electronic resources.

Key words: Informational retrieval skills, Perceived ease of use, Demographic variables, Library electronic resources.

Word count: 444

DEDICATION

This work is dedicated to the King of Glory, the lifter up of my head, who made this possible and to my husband and Crown, Umunna, Chijioke Ekenna.

CERTIFICATION

I certify that this work was carried out by Mrs. M.C. Ekenna in the Department of Library, Archival and Information Studies, University of Ibadan, Nigeria.

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ACKNOWLEDGMENTS

I thank God Almighty for his journey mercies, sustenance, love and grace that enabled me to complete this programme.

I am immensely grateful to my supervisor, Prof. Iyabo Mabawonku for working with me throughout these past years. I sincerely appreciate her friendship, encouragement, criticisms, advice and wonderful input into this thesis.

My appreciation goes to all my lecturers, teaching and non-teaching staff in the department of Library, Archival and Information Studies for their encouragement. Also, I am deeply grateful to Drs. Kenneth N. Nwalo, Andrew O. Okwilagwe, A. Adetimitirin, Williams Nwagwu, Femi Adegbesan, Wole Olatokun, Nnanna Eleri, Mrs. Evelyn Emeahara and Mrs. Kate Fatoki. Thank you for your assistance and encouragement. I am equally grateful to my analyst, Dr. O. Ogunleye and my research assistants for their hardwork and assistance.

I also wish to thank my parents, Mr. & Mrs. Linus Chiekezi Ehirim, Prof. & Mrs. Godwin Emerole, my mother-in-law, Ugoeze Gabline Ekenna, Mr. & Mrs. Ndukwe Nlemadim, Engr. Chinwe Ogboi, Mr & Mrs. Innocent Okonkwo, Mrs. Mercy Koroyin, Mrs Helen. Emasealu and Mrs. Chioma Ekeke for their assistance, encouragement and prayers.

My sincere gratitude goes to Mrs. Ukachi Numbere for all the times she took care of my son, Akachukwu, for me to be in Ibadan and for her prayers.

I am deeply indebted to my husband, Engr. Umunna Ekenna and my children, Chidinma, Nkechinyere, Eberechi and Akachukwu Ekenna for their unflinching support, encouragement, prayers and understanding. Thank you very much and may Almighty God bless you all. I will be grateful forever for my mother, an excellent woman with an excellent spirit, who encouraged, prayed, supported and waited for the completion of this programme but was called home to Glory two months before the orals of the thesis. May you find peace with your Creator.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Electronic resources are the bedrock of provision of accurate and timely information for better educational outcomes. They aid in the retrieval of huge amount of information for learning, teaching and research in universities. Presently university libraries are in the process of provision and promotion of e-resources since one of their missions is to meet the information needs of their users.

The Anglo American Cataloguing Rules 2 (2002) cited in Weitz (2004) defined electronic resources as material/data and /or program(s) encoded for manipulation by a computerised device. These materials may require the use of a peripheral directly connected to computer (e.g. CD-Rom drive) or a connection to computer network (e.g the Internet). There are different types of electronic resources such as Compact Disc Read Only Memory (CD-ROM), the Internet, Online Public Access Catalogues (OPACs), electronic databases, electronic books, WebOPACs, electronic abstracts, electronic journals, electronic archives, electronic workshop, electronic conference and electronic index. Electronic resources such as CD-ROM, the Internet, OPACs, e-databases, e-books, WebOPACs, e-abstracts and e-journals have acquired high utility value to majority of users because of the speed and ease with which they can be retrieved and utilised. Also e-resources are popularly used by students for information retrieval since the information contained in them, are known to be recent and up-to-date. In addition, some of these e-resources are used due to their time saving qualities and the convenience of remote access to full text-journals (Barret, 2005).

Electronic resources according to Patitungkho and Deshpande (2005) and Sharma (2009) are common in university libraries and large amount of money is spent on them in university libraries (Bhat, 2009). Furthermore many Nigerian university libraries spend a great proportion of their annual budget on electronic resources. Ani and Ahiauzu (2008) indicated in their study that there is a high level of development of electronic information resources in Nigerian university libraries. The provision of electronic

resources in university libraries holds the promise of endless possibilities of access to vast amount of information without the barriers of time and place. Advances in information and communication technologies have brought about an increase in the provision of electronic resources in university libraries. Ani (2005) opined that the inability of the government to stock libraries with relevant books and literature particularly in the academic institution is part of the reasons for exploitation of information and communication technologies. An empirical study carried out by Ani and Ahiauzu (2008) revealed that 89.5% of Nigerian university libraries have Internet connectivity, 68.4% subscribed to electronic databases and online databases, 57.9% have CD-ROMs, and 52.6% have electronic books. The avalanche of electronic resources in university libraries provides unimpeded access to unlimited information for students research work. In this era of competitive research and knowledge acquisition, university students now patronise their university libraries to retrieve accurate and current information from electronic resources available in all subject fields, for research activities and advancement in general knowledge. However, the use of electronic resources by students may depend on their information retrieval skills, perception of ease of use of e-resources and demographic variables.

University students include undergraduates and postgraduates. The undergraduates are those studying for their bachelor's degree while the postgraduates are those that have completed their undergraduate studies but are still in pursuit of their masters, doctoral and postgraduate diploma. Some undergraduates come into the universities with some computer skills which may not be adequate to retrieve information and this poses some problems during research. Giving credence to this view, Barret (2005) stated that undergraduates, in general, cope with considerable anxiety at the initial stages of their project development and they often have difficulty in framing questions and focusing their research questions.

Research is very vital because it enables students to investigate problems with the main aim of proffering solution for them. The Tennessee State University (2012) defined undergraduate research as any creative effort undertaken by an undergraduate that advances the knowledge of the student in an academic discipline and that leads to new scholarly insights or the creation of new works that adds to the wealth of the discipline.

Research requires thorough inquiry into a topic using all print and electronic sources (Alkaleri, 1999). Through research, students are able to contribute to knowledge. They discover problem areas in the society and after collecting data/information on the subject area and interpretation of the work, they give recommendations on how the problems can be solved. To boost undergraduate research, the Oregon State University Library (2010) indicated that their library instituted an Undergraduate Library Research Award. The sum of one thousand dollars ($1000) scholarship is awarded to any undergraduate who through the comprehensive use of the Oregon State University Libraries present outstanding research, scholarship and originality in writing a paper or completing a project. Similarly, university students in Nigeria are also expected to present standard projects, dissertations and theses to their lecturers before the award of any degree. In order to present quality research work to the university, students rely on the libraries which are primarily set up to acquire , organize, store and make accessible to the user within the quickest possible time all forms of information materials which they acquire (Nwalo, 2003).

Libraries are the focal point in the acquisition of knowledge and are therefore a necessity for universities. This is because universities according to Bargh, Bocock, Scoft and Smith (2000) are knowledge institutions that are at the apex in the production of headline knowledge. University libraries provide resources like journals, textbooks, magazines, newspapers, reference materials, audio-visual materials, and electronic resources. University students patronise the university libraries to use the resources to acquire more knowledge on topics taught in the classroom, collect information for assignments, term papers and project writing, prepare for examinations and broaden their knowledge on specialised and general topics. University students also need information on conferences, meetings and how to obtain research grants. Furthermore, students require information on how to plan their research, collate comprehensive background knowledge of their subjects, formulate hypothesis, keep abreast of recent developments, write relevant articles and collaborate with researchers around the world on recent happenings in their fields of interest.

Owing to the information explosion and emergence of new technologies, information needed by students are now found in electronic resources in university

libraries, technology centres and computer laboratories. These technologies have brought an alternative to facilitate access to scholarly information for teaching and learning. Consequently, students' information needs for research are met without much difficulties. Their information needs can be satisfied from primary sources like journal articles and research reports or secondary sources such as textbooks and reference books like the dictionary and encyclopedia.

Tertiary sources, which include the abstracting and indexing journals, can also be used by students to collect current information for research. These information sources are no longer only in print, but also in electronic forms. They can now be retrieved from different types of electronic resources such as CD–ROMs, Internet, OPACs, electronic books and electronic journals by using appropriate search strategies including Boolean operators [OR, AND, NOT), truncation, proximity features and search engines such as Yahoo, Google, Excite and Alta vista. Also, electronic books, electronic journals and OPACs can be searched online through the Internet. Nottage (1998) and Dada (2000) cited in Omekwu (2004) aptly explained that:

> Since research runs on the wheel of information, information technology provides the researcher with information without the restriction of time, space or format. Large information is obtained from single CD-ROM. A researcher in Faculty of Education can visit the libraries of university of Oxford or Harvard and from his desktop conduct literature searches relevant to his work. He can download; print or order online needed materials. Moreover, with search engines like Google, Mama, Alta Vista, Lycos and Yahoo, researchers can obtain information on almost all subjects from all over the world (p.163).

However, it has been observed that undergraduates mostly use Google search engines for information search. Asemi (2005) cited in Patitungkho and Deshpand (2008) opined that Google search engine is used because links are provided to websites in the world through it. Also, it is fast in access and the information are regularly updated. In spite of the introduction of electronic resources in the university libraries, there is still much concern by researchers about the paucity in their use. William (2006) cited in Bhat (2009) indicated that academic libraries spend millions of dollars a year on e-resources yet many of them are underutilised and unknown to users. Furthermore, it appears that undergraduates still find it difficult to use them for research. The probable cause of non-use of e-resources for research is probably lack of information retrieval skills. Ojo and

Akande (2005) examined students' access, usage and awareness of electronic information resources and identified lack of information retrieval skills for exploiting electronic resources as the major problem faced by medical students. The lack of information retrieval skills brought about very low usage of e-resources by the students. Fordjour, Badu and Adjei (2010) attributed the poor performance of students in various universities in Ghana to students' inability to effectively retrieve information for academic work.

Information retrieval skills are crucial for retrieving information for good educational outcomes. Students who cannot retrieve the exact information which they need for academic work may end up with average grades in their class assignments and research work. In this era of technology where most of the information needed for research can be located in electronic sources, students' efforts to complement their work with electronic resources may be limited due to lack of skills (Ray and Day, 1998). The inability to retrieve information may be frustrating to students who put in long hours in the library searching for information. Therefore knowledge of skills may be necessary to selectively retrieve accurate and enough information stored in documents instead of all the information that may not be relevant for their research. Moreover, skill in information retrieval may reduce the time wasted in seeking information. To surmount the problem of retrieving information, students may require a combination of skills which include informational retrieval skill, operational retrieval and strategic retrieval skills to make the process of retrieving information a simple task.

The informational retrieval skills which the university students need include those needed to navigate, select the appropriate information, evaluate the information and re-use information (Gui, 2007). These entail being able to handle the changing contents of computer and information sources and knowing where and how to look for the resources.

Operational retrieval skills include the ability to operate computers, electronic resources connection and their basic applications (Gui, 2007). Students need to learn to operate the computer and understand how the information systems are organised by learning the basic skills such as use of keyboard, mouse, and disk management. Learning the standard software (word processing, databases and others) and network applications such as Internet, electronic mail and others are also required for retrieval of information. For instance, McGuigan (2001) is of the opinion that the level of computing and Internet

experience gained by students prior, to entering higher education might influence their readiness to use the library's electronic resources. Students also need to have strategic skills for retrieving information from electronic resources.

Strategic retrieval skills are defined by Gui (2007) as the ability to use computer and network sources as the means of achieving particular and general goals of improving one's position in society. These skills entail the ability to plan, create appropriate queries and search terms which would enable the students to retrieve information. Undergraduates' ability to develop their strategic skills would aid in retrieving relevant information for academic purposes and self enhancement.

Skills can be acquired formally through courses in the university or informally through assistance from friends and staff in the library. Skills acquisition is very crucial to the use of electronic resources because information in electronic forms can only be used if students possess the skill to retrieve the exact information needed for research. Ozoemelem (2009) argued that students must acquire and practice the skills necessary to retrieve information from electronic resources. In support of this view, Brophy (2003) opined that libraries should reach a position where acquisition of information skills is considered as one of the key learning objectives for all students entering the university. Brophy(2003) further explained that this would enable the students to be fully equipped to cope with the information intensive world.

Although some undergraduates may likely acquire skills owing to their course of study which probably expose them to constant use of computers (Vakkari and Torma, 2004) however, for academic excellence, students are expected to find appropriate ways of retrieving precise information without frustration and waste of precious time. Students with high-level skill in retrieval of information are more likely to have more materials for research and information to maximise learning than those with low-level skills. This perhaps, is because the skilled students may be knowledgeable in the area of search strategy and search terms. This knowledge may increase skilled students search speed which can give them ample time to retrieve information before leaving the system for other users. However, students with low-level skill would probably retrieve many irrelevant materials which can result to frustration. Furthermore, since such students are

likely to be slow in searching and retrieving information, they may not have the time to retrieve all the relevant materials they need.

Perceived ease of use of e-resources may be another determining factor that could inhibit university students' utilisation of electronic resources for research. Davis (1989) defined perceived ease of use as the extent to which a person believes that the use of technology will be free of effort. Perceived ease of use cannot be separated from utilisation of electronic resources because perceived ease of use of electronic resources will enhance the use of the resources. In support of this view, Park, Lee and Cheong (2007) opined that perceived ease of use has an indirect effect on the behavioural intention to keep using technology. Perceived ease of use could be influenced by prior experience, training and perceived usefulness. A student who has not had an easy experience in the use of e-resources or who has had no training on its use will not believe the use of e-resources to be easy (Brown, 2002). Also students' perceived ease of use of e-resources may depend on their understanding that it is useful for their research. Positive perception of the ease of use of electronic resources may encourage the actual and constant use of the resources for academic work and research.

Furthermore, some demographic variables such as gender, age, and course of study have been linked with utilisation of electronic resources. According to Agbonlahor (2008), a study of first year medical students in Denmark by Dorup (2004) observed that males had more positive attitudes towards the use of computers than females. Tenopir (2003) posited that there is little evidence that gender in most cultures make a difference in use of e-resources but revealed that women used more e-journals in the DLF/CLIR/Outsell studies. Ford et al (2001) cited in Waldman (2003) found that females tended to experience more difficulty finding information on-line, feel less competent and comfortable using the Internet. They further observed that females make use of a less varied set of Internet applications. Monopoli et al (2000) cited in Tenopir (2003) indicated in their study that frequent users of electronic journals were found to be mainly between 21 and 34 years of age. Furthermore, Tenopir (2003) stated that there is evidence that younger users are more enthusiastic adopters than the older users. Moreover, she opined that younger users rely on e-resources more heavily and rate themselves as more expert in using e-resources than the older ones. Majid and Abazova (1999) in their study

of computer literacy and use of electronic information sources by academics opined that faculty with higher computing skills would be more likely to use and be familiar with their library's electronic resources than the faculty with low computing skills. However, Borgman (2000) and Tenopir (2003) revealed that one of the major factors explaining the use of electronic libraries is the scholar's course of study. Their studies indicated that representatives of science and medicine use electronic resources more frequently than humanists and social scientists. Also, Abels et al (1996); Eason et al (2000); Tenopir (2003) cited in Torma and Vakkari (2004) indicated that the discipline of researchers is connected with the use of literature and libraries in electronic format. This also implies that the course of study also known as discipline, as a demographic variable may determine utilisation of electronic resources.

For e-resources in the libraries to be of great benefit to students, it is probably important that students should acquire retrieval skills and equally perceive the use of e-resources as easy. Electronic resources are important in libraries due to their immense benefits to students and university libraries. Electronic resources according to Ray and Day (1998) afford students the opportunities of access to relevant and up-to-date information from different subject fields. They are also the link to the process of useful research and learning activities. Information in electronic resources is sometimes up-dated and students are given the opportunity of multiple file searches which cannot be done with printed tools. Moreover, information collected from electronic resources by students can be printed out or saved to be retrieved later. Ray and Day (1998) stated that recalling information from electronic information sources are often faster than consulting print indexes, especially when searching retrospectively and they are straightforward when combination of key words are used. E-resources save the time that would otherwise have been used in searching through pages of printed tools. E-resources also contain large volumes of information which allow students to retrieve as many quality information as they desire. These electronic resources are gateways to other resources. This means that students can retrieve information from around the world with minimal difficulties. Dadzie (2007) cited in Egberongbe (2011) posited that some of the advantages of e-resources include access to information that might be restricted to the user due to geographical location or finances, access to more current information and

provision of extensive links to additional resources or related contents. Also Navjyoyi (2007) explained that speedy publication and availability on the desktop are the key advantages that attract research scholars to e-resources.

Furthermore, electronic resources offer significant benefits to university libraries such as reducing the problem of inadequate space and mutilation of books. Giving credence to this view, Norris (2004) asserted that electronic resources reduce pressure on academic libraries for physical space for storage of books and journals, gives the librarian the assurance that the electronic books and journals are complete, not vandalised and in the right place and provides unlimited access to users. Electronic resources encourage interlibrary loans and give fast and easy link to other libraries. Through electronic resources, university students are given access to current materials and educational information for learning and research. They provide health information, news and entertainment for students. Furthermore, they encourage online course support and access to archival materials (Ekwelem, Okafor and Ukwuoma, 2009). Electronic resources provide information on development around the world and information in recent research which aid academic enhancement of students. In the view of the obvious strengths of electronic resources, it is imperative that the gaps in the use of e-resources by students such as their retrieval skills, their perception of ease of use of the resources and the demographic variables such as age, gender and their course of study should be addressed so that the amount spent on electronic resources can be accounted for. For instance, the average library budget that is spent on electronic materials increased almost fourfold from an estimated 4% in 1992-93 to 13% in 1999 (ARL, 2005). Furthermore Bhat (2009) observed that his university in 2007-8 subscribed to e-book resources having over 15000 high class text books. However, the total hours spent by all the users on the resources throughout the whole year was only 8700 hours, which meant that the average time spent by each student reading the e-books in a year was just 1 hour 37 minutes. The probable cause of this could be that students do not use e-resources due to poor skill. Also, they may not perceive e-resources as easy to use which perhaps may discourage them from the use of the resources. Undergraduates therefore should be assisted in learning the use of these resources so as to rise to the challenges of the information age.

For optimal benefits to be derived from the use of electronic resources, it is often required that undergraduates should be skilled in the search process, be aware of the different search strategies which would lead them to the particular information they need for research. Furthermore, undergraduates should be encouraged to often use e-resources for studies, class assignment and research because frequent use of e-resources may enhance their retrieval skills. However, undergraduates probably would not be able to use e-resources for academic activities and research if they do not perceive it as easy to use. Therefore undergraduates, perhaps, should be taught the use of e-resources as this probably would influence their perception of electronic resource use. Moreover, if undergraduates perceive the use of e-resources as easy and are not constrained by their age, gender and their course of study, they may be motivated to learn the different skills which could bring about actual and optimal use of the library e-resources.

1.2 Statement of the Problem

In Nigeria as in many countries across the globe, print information resources in university libraries are systematically being complemented by electronic resources. These include CD-ROM, e-books, OPACs, e-databases and e-journals, among others. In the past, university students encountered problems such as inadequate literature and lack of information for the background of research work but e-resources now aid in alleviating these problems. However, use of these resources may be functions of many factors which include awareness of the existence of the resources by students, availability of the necessary hardware, internet connectivity, students' perception of ease of use of the resources, demographic variables and students' skills to manipulate the hardware and software prior to retrieving information in the resources for subsequent research usage.

Some literature observed, through records of use in most libraries, that most of these electronic resources are underutilised by undergraduates thereby resulting in a loss of optimal benefits in regard to the huge investment on electronic resources by the government. This may be because some of the undergraduates are not aware of the benefits of e-resources and do not use them for research while some of them who use the e-resources do not fully utilise them for research. This may be due to lack of information retrieval skills as many of the students do not know the search process that could help

them retrieve relevant information. Also, some of the undergraduates probably use only Google and Yahoo search engines to access information and some of them, perhaps, do not perceive e- resources as easy to use which may discourage utilisation of e- resources for research.

This study therefore investigated whether university students' information retrieval skills, perceived ease of use of e-resources and demographic variables would determine utilisation of library electronic resources for research.

1.3 Objectives of the Study

The broad objective of this study is to determine the relationship between information retrieval skills, perceived ease of use, demographic variables and utilisation of library e-resources for research by students in Nigerian universities. The specific objectives of the study are to:

1. find out the frequency of utilisation of e-resources by undergraduates in Nigerian universities;
2. identify the extent to which the undergraduates use e-resources in research;
3. investigate undergraduates' level of information retrieval skills in terms of informational, operational and strategic retrieval skills;
4. determine the relationship between the retrieval skills (informational retrieval, operational retrieval and strategic retrieval skills) and undergraduates' library e-resources utilisation for research;
5. identify the relationship between perceived ease of use and undergraduates' library e-resources utilisation for research;
6. find out the relative contribution of retrieval skills and perceived ease of use to library e-resources utilisation for research by undergraduates;
7. examine the existing relationship between demographic variables (age, gender, and course of study) and students' library electronic resources utilisation for research.

1.4 Research Questions

The study is guided by the following research questions:

1. What is the frequency of undergraduates' utilisation of electronic resources in their university libraries?
2. To what extent do undergraduates utilise e-resources in research?
3. What is the level of undergraduates' electronic information retrieval skills in terms of informational, operational and strategic retrieval skills?
4. What is undergraduates' level of perception of the ease of use of electronic resources?

1.5 Hypotheses

The following hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between retrieval skills (informational, operational and strategic) and undergraduates' utilisation of electronic resources in university libraries.
2. There is no significant relationship between perceived ease of use and undergraduates' utilisation of electronic resources in university libraries.
3. The three retrieval skills do not have significant composite effect on undergraduates' utilisation of electronic resources in university libraries.
4. The three retrieval skills do not have significant relative effect on undergraduates' utilisation of electronic resources in university libraries.
5. The three retrieval skills and perceived ease of use do not have significant composite effect on undergraduates' utilisation of electronic resources in university libraries.
6. The three retrieval skills and perceived ease of use do not have significant relative effect on undergraduates' utilisation of electronic resources in university libraries.
7. There is no significant relationship between the demographic variables (age, gender and course of study) and undergraduates' utilisation of electronic resources in university libraries

1.6 Scope of the Study

The study focused on fourth year undergraduates in ten federal universities in Nigeria. The choice of federal universities out of the various types of universities such as state owned and private universities is on the basis that they receive huge funds from the

federal government and large amount of money is spent on e-resources in their libraries. Furthermore, they have many titles in their libraries which come in electronic format due to their collaboration with intervention and donor agencies like Tertiary Education Trust Fund (TETFUND), Elsevier, Carnegie and MacArthur foundations. However, the use of e-resources in the federal university libraries is yet to be determined. Fourth year undergraduates were focused on because they may likely use e-resources to write their projects due to the National Universities Commission's (NUC) requirement that fourth year undergraduates should present projects before the award of their degrees. Furthermore, ten universities were focused on so as to have a manageable population. Also the faculties of Arts/Humanities, Social Science and Science were covered because of their availability in the universities used for the study. Variables covered in the study are retrieval skills (informational, operational and strategic skills), perceived ease of use, demographic variables of age, gender, course of study and electronic resources. Although there are many demographic variables, only the variables of age, gender and course of study were focused on because they are often used for students' demographics. The study equally focused on electronic information resources. The e-resources covered in the study are OPACs, the Internet, CD-ROM, electronic abstracts, electronic journals, electronic databases and electronic books. These e-resources were selected because they are the ones mainly used by university students for electronic information retrieval.

1.7 Significance of the Study

Increasingly, university libraries are expected to provide electronic resources for their students to boost learning activities and research work. Research studies could provide solutions to some problems in the society and equally add to knowledge. This research study would provide solutions to some problems bedeviling students in information retrieval and library e-resources use for research and equally add to knowledge. This study is particularly significant in that it would contribute to the existing knowledge on undergraduates' retrieval skills, perceived ease of use of e-resources, demographic and e-resources use for research in Nigerian university libraries.

University librarians would also benefit from this study owing to the fact that the study would reveal undergraduates' areas of need in information retrieval skills and the

electronic resources commonly used by undergraduates for research purposes. This revelation would influence how the librarians invest in provision of e-resources and it would lead them to mount programmes that would enhance students' use of electronic resources for research.

Similarly, the study would reveal undergraduates' perceived ease of use of library e-resources and their limitations in using the e-resources available in the libraries. This would enable university libraries to correct the problem areas thereby enhancing students' perception of e-resources use which in turn would encourage students' use of e-resources. The libraries also would be encouraged to focus on training for students and capacity building for library staff. This would lead to increased use of e-resources and possibly encourage the acquisition of more resources in university libraries.

It is also hoped that through the study, undergraduates would discover the relevance of retrieval skills to library e-resources use for research. The realisation of the importance of the skills would lead students to search for ways of developing their skills.

1.8 Operational Definition of Terms

The following terms are defined in context of how they are used in the study.

Course of Study: They are the different courses offered by students in the universities. It is used interchangeably with discipline in this study.

Electronic Information Resources: Electronic information resources, for the purpose of this study, can be referred to as information collated and stored electronically in OPACs, CD-ROMs, e-journals and other e- resources used for research by undergraduates.

Electronic Resources: Electronic resources include any type of electronic/digital resource which aids in location and selection of information.

Information Retrieval: Information retrieval in this study refers to the processes through which students seek for information.

Informational Retrieval Skills: This refers to a user's competence in locating selecting and evaluating information.

Operational Retrieval Skills: refers to the ability needed by a student to manipulate a computer and its basic applications.

Perceived Ease of Use: This refers to the extent to which a user believes that information technology can be used without difficulties.

Research: Research, in this study**,** means the process of gathering information for students' academic work.

Search Engine: This has been defined as websites which store information about web pages and which allows students to search through this information to find the specific page that they are looking for. Some popular search engines are Yahoo, Google and Alta Vista.

Strategic Retrieval Skills: This refers to the competence of a user to map out plans that aid in swift and optimum accessibility of information**.**

Undergraduates: These are students admitted into the universities, after their secondary school education, in pursuit of academic degrees. Undergraduate is sometimes used interchangeably with students in the study.

Utilisation of Library Electronic Resources: This is the extent to which library e-resources are put to use for research by undergraduates.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter consists of relevant literature, concepts, theories and framework that gave direction to the study. Literature was reviewed under the following subheadings:

2.1 Electronic information resources used for research

2.2 Utilisation of electronic resources in universities – overview

2.3 Availability and utilisation of electronic resources in African universities

2.4 Students' utilisation of electronic resources for research

2.5 Concept of information retrieval and search strategies for electronic resources

2.6 Information retrieval, skills acquisition and utilisation of electronic resources

2.7 Challenges of information retrieval and utilisation of e-resources by university students

2.8 Perceived ease of use of electronic resources for research by university students

2.9 Demographic variables and utilisation of electronic resources

2.10 Theoretical framework

2.11 Appraisal of literature review

2.1 Electronic Information Resources Used for Research

The use of electronic resources has contributed in reshaping access to information and the retrieval process. In the past, information was transferred mainly from the librarians to the users. Presently, most of the communication and transfer of information is between the users and the computers and this is due to the storage of information in the electronic resources which are usually operated with use of computers. Today, there are several of these electronic resources in university libraries such as OPACs, e-journals, e-books, CD-ROM, e-databases, WebOPAC, and e-abstracts and they are accessible through the Internet.

Ojokoh (2005) described the Internet as a 'worldwide collection of networks, gateways, servers and computers using a common set of telecommunications protocol to

link up'. It aids in accessing of up-to-date information anytime and anywhere in the world. Ojedokun (2001) posited that Internet is a fast, reliable tool which has broken down barriers of communication and information. Furthermore, the United Nations Information Communication Development Indices (2003) revealed that Hargittai (1999) referred to Internet as a worldwide network of computers. They also opined that Internet is a network of people that use computers to make vast amounts of information available.

The Internet is vital in libraries and this incredibly versatile tool has made an impact in the area of access and information retrieval in the libraries. While discussing the importance of the Internet, Onwubiko (2004) revealed that the Internet has given an extensive view of the process and procedure of location, collection, organisation, storage, retrieval and dissemination of information to library users. Pallen (2003) and Ibegwam (2O04) also affirmed that the Internet is very important for health information due to the extensive biomedical resources which it provides.

Similarly, Kibirige and Depalo (2000) asserted that the Internet is an important source of academic research information while Golian (2000) referred to it as a resource which presents librarians and educators ways to support their approved curriculum and desired core competencies of their educational institutions. Giving credence to this view, Aina (2004) revealed that newspapers, magazines, e-mail, bibliographic and full-text databases, library catalogues on OPACs, constitutions of various countries and other information can be accessed through the Internet. Also, Starr (1998) in his study on the Internet and higher education, referred to Negroponte (1995) who estimated that by the year 2000, over a billion people will engage in some form of Internet activity.

The Internet has a lot of capabilities which has made it a very dependable source globally. Alasa and Ibenne (1998) enumerated some of the capabilities as: access to regular updates on topics of interest; transfer of data between machines and provision of great platform for fun and entertainment; quick and convenient information exchange; wealth of up-to-date resources unavailable in bound volumes and access to experienced and expert individuals in thousands of fields.

Furthermore, there are several features of the Internet such as the electronic mail (e-mail), World Wide Web (www), usenet, newsgroup, Internet facsimile and mailing list. Through the access to Internet one can connect to database providers like Silver

Platter and Ebscohost (Moahi, 2002). There are also several search engines which can be used to access information in the Internet. Examples of the search engines include Excite, Alta Vista, HotBot, Yahoo, Info seek, Lycos and Google. These different features and search engines aid in maximum accessibility of the Internet and quick retrieval of information.

However, despite the growth in Internet usage, the United Kingdom National statistics Omnibus Survey (2004) revealed that in many countries, there are significant proportions of people who do not have Internet access. The survey showed that in July 2004, 37% of adults had never used the Internet while 21% of adults said they would never use it.

Also CD-ROM is an electronic resource commonly used in the university libraries. CD-ROM is an acronym for Compact Disc Read Only Memory. It is the most widely used and it is also a very popular electronic resource. The CD-ROM is less complicated to use for information retrieval. CD-ROM requires a computer with a CD-ROM drive and the CD-ROM discs that contain databases. Therefore, Ojo-Igbinoba (1993) wrote that to effectively use the CD-ROM, the computer system must have a CD-ROM drive of required speed. Obajemu, Ogunyade and Nwoye (2004) and Aina (2004) in their different research works explained that data in CD-ROM drive can easily be read by laser technology and it cannot be written on, erased or modified by the user.

Many libraries now have CD-ROMs and this is because the CD-ROM databases are in-house and do not need to connect to providers stationed abroad (Moahi, 2002). Giving credence to this view Ojo-Igbinoba (1993) posited that CD-ROM is like a book which once you have bought it can be used and for as long as one wishes with no extra charge.

Discussing the capabilities of CD-ROM, Aina (2004) wrote that a CD-ROM is capable of storing up to 250,000 pages of text which includes directories, books, computer applications, music and periodicals. Furthermore, France-Plassard and Line (1988), Siddiqui (1997), Adesanya (2002), Agbaje (2003), Aina (2004), Obajemu, Ogunyade and Nwoye (2004), Okpala and Igbeka (2005) in their different research works highlighted some of the advantages of CD-ROM as:

- Provision of quick and easy access to information source without waste of time and with minimal stress.
- It does not incur telecommunication charges.
- It is not easily damaged or susceptible to scratches.
- Provides economic use of space in libraries
- The use of CD-ROM provides rapid responses, increased flexibility, easy operational procedures and user satisfaction.
- It is user friendly - can be used directly by end-users.
- There is no geographical barrier since it can be accessed within or without the libraries through computer terminals.
- Fluctuations of light or power outages and heat do not affect it because of the polycarbonate material used for manufacturing it.
- The use of CD-ROM allows easy and accurate budgeting since it is subscribed to annually and it allows unlimited access to the database.

Despite these benefits, there are some limitations to the use of CD-ROM such as, that the users may not have time to master the use of CD-ROM or retain its expertise and there may also be the issue of security since the disc can be stolen if kept carelessly (Obajemu, Ogunyade and Nwoye (2004), Okpala and Igbeka(2005). Also, (Ojo-Igbinoba, 1993) explained that there is the problem of connecting more than one microcomputer to one CD-ROM player, therefore only one user at a time can access information on the disc. Furthermore information stored in CD-ROMs are not up-to-date as users have to wait for the new edition (Moahi. 2002).This "can expose infrastructural weaknesses in the form of limited periodical holdings and inadequate interlibrary loan services"(Massawe, 1994).

However, Thomas (2004) stated that access to Internet and CD-ROM motivates students, improves attitude towards reading and writing tasks, improves the language skills of reading, writing, spelling and vocabulary. It further provides access to other points of view that create opportunities for critical thinking. Also, it increases students' choice and sense of control of their own learning and creates opportunities for inquiring learning, student independence and individualised learning (Thomas, 2004).

Similarly, Online Public Access Catalogues (OPACs) are used for information retrieval. OPACs, according to Herreo-Solana and De maja-AnegÓn (2001) are automated information retrieval systems that constitute the most readily available source of information for non-professional users. Ariyapala and Edzan (2002) referred to OPAC as a computerised catalogue that contains records of items in a library or an institutional organisation. Most academic libraries are equipped with OPAC for storing, locating and retrieving of library materials.(Ariyapala and Edzan, 2002). Presently catalogues of university libraries can be accessed through the Internet. Lee and Teh (2001) revealed that 50% of academic libraries in Malaysia provided access to their OPACs through web interface such as WebPac, GeoWeb and VTLS Web Gateway. However a university student searching the OPAC requires a conceptual knowledge of the information retrieval process. Borgman (1996) opined that the user of OPAC should be able to translate an information need into a searchable query. The user should know how and when to use system features. Also the user should have technical skills in executing the query.

To use online catalogues, users are expected to enter commands to direct the system such as commands to control users search, control display format and commands, to control output of result. Online catalogues have different search term options including, keywords searching of the access points, author search, Boolean logic, title search, shelf list and subject search. Any significant word in the title could be used for title search. In subject search, any significant words in subject headings or index terms are allowed for the search. Furthermore, surname and given name of personal author or any significant word in a corporate name could be used for author search. Classification number, class mark or a range of numbers could be used for shelf list while search terms may be combined with Boolean operators whether the Boolean operators are stated by the search or implied by the system (Borgman, 1996).

Baker (1994) cited in Borgman (1996) posited that online catalogue did not meet users' expectations of ease of use or functionality which has resulted in calls for return to the card catalogue. However Chisenga (2006) opined that it is easy for library users to learn and use the OPAC from different library systems because the users only have to know how to use one universal access client which is the Web browser. Chisenga (2006)

further revealed that in Web based OPACS users can link to other information resources like full-text documents, works and titles by the same authors and tables of content.

Electronic journals are also becoming significant in research and in many fields of study due to the wealth of information in them. Simpson and Seeds (1998) cited in Davidson De Palma Collins (1999) reported that the growth in electronic journal titles is not only in fields of science and technology but in humanities as well. There are different types of electronic journals, which include CD-ROM, networked and online electronic journals. CD– ROM electronic journals are those journals that are accessible through the use of CD-ROM. The networked electronic journals are those journals accessible through mail list software or a client/ server network (Davidson De Palma Collins, 1999) while online electronic journals are the journals that are available only when access is paid for.

Electronic Books are also used for information retrieval. An electronic book "is any content that is recognisably 'book-like', regardless of size, origin or composition but excluding journal publications made available electronically for reference or reading on any device (handheld or desk-bound) that includes a screen"(Armstrong,2006). Electronic books are gradually changing learning behaviour. One can carry several titles of electronic books on a portable reader and overtime build a personal library (Snowhill, 2001). Content of the books are always accessible. Also new editions of electronic books can be done easily.

Electronic books features include full text searching citation creation, mark-up and changeable font size. Some of the vendors are Questia, Ebrary and NetLibrary. For instance the Netlibrary according to Omekwu (2003) provides access to more than 40,000 electronic books stored in their server and has approximately 3, 000 as public domain resources. The utilisation of electronic journals and books is vital for research, for instance, Science Direct adequately supports researches in the fields, of natural science, medicine, engineering, food science and social studies.

2.2 Utilisation of Electronic Resources in Universities – Overview

Electronic resources have been used to provide accurate and timely information, especially for students who depend greatly on the electronic resources for information to boost research and collaboration with counterparts around the world for intellectual

growth. Information is in fact very crucial for the acquisition of knowledge and development. This explains the rationale for the introduction and acquisition of electronic resources in libraries around the world to facilitate scholarly communication.

In China, the Baozhalong Library in Shangai Liano Tong University and Ocean Information Institute provided CD-ROMs including LISA, NTIS (National Technology Information Service) and MEDLINE for their users (Salanje, 1995). Salanje further revealed that by 1988, the University of Bahrain was subscribing to more than 25 different CD-ROM databases in science and technology, arts, social sciences, library technical services and general references. Also, that PAHO (Pan American Health Organisation) integrated LILACS and REPIDISCA (their two health information databases) into a single regional database and started to pre-master a prototype CD-ROM version in early December of 1986 in San Paulo, Brazil. The provision of databases provided the users a way to access large bodies of information and to retrieve the needed information quickly. According to Salanje (1995), libraries in China, Peru, India, Bangladesh and Cuba were among the selected group of 40 libraries in 24 countries that benefited from a donation of prototype disc with a total of 187,000 complete records from the CAB Abstracts databases which covered the period of November 1983 to March 1985 and from the database of the Bureau of Hygiene and Tropical Disease from donor organisations.

Owing to the presence of electronic resources, there is a reduction in the number of mediated searches in some libraries in America and Hong-Kong. This is because they find the CD-ROM easy to use (Salanje, 1995). Also, Hart (1996) wrote that an empirical finding concerning goals of users searching OPAC at a Northeastern United States University revealed that respondents only used OPACs to search for course or degree related projects. Teh (1996) revealed that a local survey carried out by Laili in 1993 on Online Public Access Catalogues (OPACs) usage exposed the fact that a high percentage of users faced problems when using Boolean logic for searching. In addition Teh (1997) revealed, in a study on information technology utilisation and library automation in Malaysian Educational institutions, that more than 50 schools have their own World Wide Web or Web home pages. Also, for immediate acquisition of information from remote places and for teaching, the University of Canberra in Australia provided Internet

access to its entire academic staff (Applebee, Clayton and Pascoe, 1997). Furthermore, Ormes (1998) reported improved services in Danish Public libraries with the provision of 42 public access computers with free Internet access (including several in the Children's library) via a leased line, in the Roskilde library while Silkeborg library offers free public access to the Internet on 17 computers. Moreover the Silkeborg library has a web server with OPACs and provides tourist information about the area. Also, Arhus library offers free public Internet access on 35 work stations and a web accessible OPAC.

According to Fayter (1998), a course titled; "Teaching and learning with the Internet" was introduced for lecturers at York University to show the importance of electronic resources and promote the utilisation of Internet. Furthermore a study by Ray and Day (1998) on students' attitude to electronic information resources in university of Northumbria at Newcastle revealed that 37.5% of the students used e-journals as information retrieval tool. Wishart (1999) discussed the advantages of the introduction of CD-ROM in the schools in the United Kingdom. He asserted that the installation of CD-ROMs in the schools increased the teaching role and status of school librarians, with 85% of schools locating CD-ROMs in the school library. In addition, Dew (2001) revealed that due to students demand for full text information, the University of IOWA libraries in America purchased access to Ebscohost to improve educational outcomes. Similarly, the University of Toronto in Missiauga has one of the largest collections of electronic resources in North America including electronic textbooks and over 10,000 e-journals subscriptions. The McMaster University which has been actively collecting electronic resources has over 4,000 e-journal subscription (Darimont, 2001). Furthermore, John Rylands library in Manchester moved some of their materials out of the library into temporary storage to provide space for the use of electronic resources to provide accurate and timely information for their users.

According to Rieldling (2004) the Cattagni and Farris statistics on Internet access in the U.S. public schools carried out in 2001 revealed that by the fall of 2000, 98% of public schools were connected to the Internet compared to 35% in 1994. Cattagni and Farris opined that the ratio of students to instructional computers with Internet access for teaching, learning and class projects in public schools improved from 9 to 1 in 1999 to 7 to 1 in 2000. There is also a dominance of access to electronic journals in environmental,

materials, medical and business studies in United Arab Emirate. According to Taha (2004), this dominance is due to the priority given to such fields of study by United Arab Emirate university research funding and graduate programmes. Taha opined that emergence of electronic journals in the library services improved efficiency of information practices as well as supported a range of research activities and trends. He revealed that at present the United Arab Emirate university library is wireless - networked throughout the five university campuses. Moreover, the university library developed interactive web portal (http:www.libs.uaeu.ac.ae), which provides access and several options to search and reaches a wide variety of networked electronic resources and services.

Ibrahim (2004) stated that the web portal developed by the United Arab Emirate University provides remote access to a great number of electronic resources which includes full text databases like Emerald, Academic Search Premier, Science Direct and United Nation official Document System (ODS). Furthermore, the library has electronic books collection in food systems, engineering and philosophy through NetLibrary. Also electronic journals covering subjects and bibliographic databases like AGRICOLA and EcoNbase and collections of Internet resources indexed by subjects are available in their library (Ibrahim, 2004). ERNETT India, a scientific society under the ministry of Communication and Information Technology, in partnership with the University Grants Commission (UGC) set up infrastructure for UGC-INFONET. The aim of the collaboration according to Chakravarty and Singh (2005) is to use information and Communication Technology (ICT) and Internet to transform their learning environment from a mono-dimensional to a multi- dimensional one. Also Chakravarty and Singh reported that to facilitate scholarly e-resources to Indian academies, UGC, INFLIBNET and ERNET interlinked universities and colleges in the country electronically in order to achieve maximum efficiency through Internet enabled teaching, learning and governance. Patitungkho and Deshpande (2005) indicated the use of CD-ROM by their faculty members in Rajabhat universities Bangkok. They stated that 42% use ERIC Database, 23% use Dao (Dissertation Abstract Online), 9% use Science citation index while 7% use LISA (Library and Information Science Abstract.

Banionyté and Vaškevičiene (2006) revealed that in 2001 only 40% of public libraries in Lithuania were able to offer computers connected to the Internet for their users while all academic libraries enjoyed Internet services. In addition, due to several governmental and private initiatives in 2005 all Lithuanian public libraries, with the exception of all the branches in villages, offer Internet services for their users. This improved the patronage and use of the libraries resources (Banionyté and Vaškevičiene, 2006). Electronic journals are highly accepted in the Netherlands especially by scientists and social scientists. Vakkari (2006) however argued that the high patronage enjoyed by e-journals is because it is readily accessible and functional, not necessarily because of its rich contents. Furthermore Dilek-Kayaoglu (2008) revealed that one of the barriers to the use of e-journals as reported by 42.7% of respondents in his study is lack of awareness of e-journal services in their library. Other barriers are; not being familiar with the use of e-journals, having problems with using e-journals and problems associated with reading text from the screen.

According to Madhusudhan (2008) cited in Sharma (2009) 78% of the respondents for the study opined that the use of the UGC-Infonet e-journals added a high dependency value on their research work. The respondents therefore requested for current article alert services and electronic document supply. On the other hand, Thanuskodi (2010) noted that students in Agricultural University Coimbatore India were aware of e-resources but they did not know about its application and techniques. Kari's (2004) study on usage of e-resources by Malaysian undergraduates reported that students at Perpustakaan tun Abdul Razak 1 (PTAR 1) were keen and aware of the availability and accessibility of e-resources and they fully utilised the e-resources. Oregon State Library (2011) revealed that as at 2009 OSU libraries provided access to more than 250 databases and 71, 972 unique electronic journal titles. The increase in coverage they indicated corresponded with an increase in usage. For instance in 2005, there were 1,852,533 searches performed in 113 databases and that increased to 4,083,486 searches in 225 databases in 2009. Further more in 2005 their number of e-books was 2,986 but that also increased to 20,547 in 2009.

2.3 Availability and Utilisation of Electronic Resources in African Universities

Many African countries have made efforts to introduce electronic resources in their libraries. In 1989 for instance, Technical center for Agricultural and Rural Cooperation (CTA) launched a project to introduce CD-ROM technology hardware, software, bibliographic CD-ROM databases in agriculture and training in basic computer skills in literature retrieval in some African countries (Massawe, 1994). Discussing the status of Information technology in Zambia, Chisenga (1995) revealed that many libraries in Zambia subscribe to CD-ROM databases. He further reported that notable CD-ROM databases are at Mount Makulu Agricultural Research Station, the Tropical Disease Research Centre, British Council library and the Martin Luther King Jr. Memorial Library in Zambia. Aboluwarin (1996) observed an increase in library use in University of Agriculture, Abeokuta due to the introduction of The Essential Electronic Agriculture Library (TEEAL) that has 130 journal titles on CD-ROM. Kiondo (1997) posited that the 1993 introduction of CD-ROM at the University of Dares Salaam (UDSM) Library through the Carnegie Corporation of New York grant brought about the acquisition of two CD-ROM work stations, a laser printer and subscription to some CD-ROM databases. According to Idowu and Mabawonku (1999) 10 (76.9%) of university libraries in Nigeria had CD-ROM databases. Also, Mutula (2000) wrote that a South African subsidiary of a US-based company National Inquiry Service (NISC) makes database available on CD-ROM. The service can be used by libraries in the region to publish their bibliographies on CD-ROM.

Many African countries have also provided Internet services for their libraries. Mutula (2000) reported on the establishment of websites by the University of Dar es Salaam in Tanzania and Makerere university libraries. He also indicated that Makerere University has dial-Up connection to a local Internet service provider (ISP). Similarly, Chuene (2001) mentioned the acquisition of 49CD-ROM databases and introduction of Internet in the late 1990s at the University of the North, South Africa. Furthermore, Mutula (2001) explained that East African countries (EAC) like Kenya, Tanzania and Uganda experienced problems with connectivity to the Internet due to the high prices of computer hardware and software. However he revealed that Makerere University in Uganda and Kenyetta University in Kenya benefited from the establishment of African

Virtual University by getting equipment and Internet connectivity. This made it possible for them to gain access to electronic journals. Mutula further explained that there are operational networks in the sub-region such as the Regional Integrated network for Africa. The network connects Kenya, Uganda, Tanzania, Zambia and Malawi. The Eastern and Southern African network covers Uganda, Kenya, Tanzania, Zambia and Zimbabwe. There is also the Pan African Documentation Information Network (PADISNET) connecting 34 countries in Africa, among Kenya, Uganda and Tanzania; and the African Regional Standard Organisation Network (ARSONET) which covers Kenya, Ethiopia, Senegal and Egypt (Mutula, 2001). In his own study, Ojedokun (2001) wrote on the provision of access to the Internet through faculty and departmental computer laboratories as well as the library in University of Botswana.

Omekwu (2002) in his study revealed that African countries are in different stages of electronic resources development and use. In the past, most of the African libraries did not have startup capital for the provision of these resources especially the CD-ROM because of the enormous amount involved. However, many of the African libraries obtained their CD-ROM database through grants and donations from international agencies and foundations such as UNESCO, USAID, CTA, the Carnegie Corporation of New York, the MacArthur Foundation and Rockefeller Foundation. In fact Magara (2002) opined that CD-ROM and on-line retrieval services were the most utilised electronic resources in Uganda. He posited that the availability of Internet in that country enhanced communication and resource sharing among the communities. In Nigeria, Oduwole and Akpati (2003) wrote on the accessibility and retrieval of electronic information at the University of Agriculture Library, Abeokuta and revealed a response rate of 53.8%. The study further found that the usage cut across all members of the university community. Ojedokun and Owolabi (2003) revealed that their respondents in University of Botswana were skilled users of the Internet only as far as its application in research activities were concerned in spite of the fact that University of Botswana, has its own website with full Internet access in their library Aina (2004). However, Jagboro (2003) in his study on Internet use at Obafemi Awolowo University, Ife (OAU), revealed that Internet access was provided to students and staff who do not have access in their various offices. Similarly, Sanni and Idiodi (2004) reported that the residential quarters at

University of Benin were being networked for Internet access. They further revealed that there is a cybercafé where staff and students can access the Internet. Also, their library collection can be accessed through the Online Public Access Catalogue (OPAC).

Asamoah-Hassan (2004) posited however, that African libraries are poorly funded. Owing to this Non- Governmental Organisations (NGOs) have come into African libraries to assist in strengthening them to perform the functions expected of them. Presently, many African countries have made efforts to provide these electronic resources on their own. Giving credence to this view, Makondo and Katuu (2004) revealed that as at 2000, the University of Zambia library had 29 CD-ROM database titles. The library was known as one of the first Southern African universities to have Internet connection in 1990. CD-ROM databases like AGRIS, TROPAG, CAB Abstracts, MEDLINE, AGRICOLA, SILVER PLATTER and POPLINE are available in most of the libraries and information units in Malawi. However Igbeka and Okpala (2004) posited that since the 1995 introduction of CD-ROM literature search into the University of Ibadan library system, the number of users of the CD-ROM facility was still very small as against the number of registered library users. This they revealed might be due to lack of current awareness or dissatisfaction of users. Badu (2004) further painted a dismal picture of information technology and resources in Ghana due to insufficient hardware, intermittent electric power cuts and staff attitude towards the new technology. Muswazi (2005) also reported the availability of 40 computers and access to 52 CD-ROM and EBSCOHOST Internet subscription based full text databases and free web resources and services. He revealed that majority of his respondents' rated print sources higher than Internet sources and CD-ROM databases. However Badu and Muswazi's report does not change the fact that presently there has been a crucial growth in the availability and use of electronic resources in Africa more than in the late 1990s. Oduwole (2005) for instance, still observed an increase in library use in University of Agriculture, Abeokuta. The increase was also attributed to the introduction of The Essential Electronic Agriculture Library (TEEAL) that has 130 journal titles on CD-ROM. The introduction of TEEAL helped research students to acquire information for their work. Furthermore, Sanni and Tiamiyu (2005) reported the availability and use of OPACs in university of Agriculture Abeokuta. Anasi, (2005) indicated that some of the universities like University of Ibadan, Ilorin, Jos,

Lagos and Ahmadu Bello University, Zaria subscribed to ISI (Institute for Scientific Information) and Silver Platter Ebscohost for database CD-ROM.

Presently, many Nigerian universities have websites. Most of the universities are connected to the Internet thereby making it possible for students to interact with their counterparts around the world. They also obtain quality information through the Internet to boost their research. Ojokoh (2005) revealed that Internet access was provided to the Federal University of Technology Akure community through the university cyber café. He further reported that none of the respondents in his research work used e-mail to communicate with lecturers. Similarly, Oduwole (2005) wrote on the increasing number of universities connected to the Internet but he asserted that the services were plagued with problems ranging from limited number of work stations, inadequate help support services, queues, space problems and lack of proper co-ordination. The existence of these problems however has not in any way dampened the provision of the electronic resources by the universities in Nigeria. The University of Ibadan official bulletin special release (2006) reported that the following electronic resources; AGORA, HINARI, LANTEEL, EBSCOHOST, EGRANARY and DIGITAL LIBRARY, are available in Kenneth Dike Library. There are also on-line journal resources such as, HIGHWIRE, ARCHIVE, AFRICAN JOURNALS ON-LINE, POPLINE, BIOMED CENTRAL and others acquired through journal donation project. Also in 2000, the university of Calabar library acquired about 16 computer systems and subscribed to a number of on-line databases such as AGORA, HINARI and EBSCO for its users (Ani, 2007). The University of Port Harcourt equally subscribed to EBSCO and JSTOR in 2006 while they subscribed to AGORA and HINARI in 2007. The University of Port Harcourt does not offer Internet services in their library. However the members of the academic community were given institutional usernames and passwords. This enables them to have access to full text journal articles, databases and other resources or the Internet from the cyber cafes in the information communication centre on campus. Okello-Obura and Magara (2008) indicated that users of electronic information at Makerere University, Uganda derived a lot of benefits from electronic resources which helps them in gaining access to a wider range of information and improved academic performance. Furthermore, they opined that the major objectives of the adoption of e-resources in the university are to facilitate

access to Internet-based information resources as well as the timely dissemination of local and international research output. Egberongbe (2011) recorded that there are e-resources in university of Lagos library and further noted that respondents in the study had become familiar with e-resources and accessed maximum relevant materials from e-journals for research purposes.

2.4 Students' Utilisation of Electronic Resources for Research

Research is a process of investigation based on accurate observations and discipline which are directed towards the solution of a problem. Alkaleri (1999) defined research as 'systematic investigation towards increasing the sum of human knowledge'. Research involves collating and processing of data and a good research work depends greatly on a student's skill in retrieving current and relevant information. Ekhaguere, Olayinka, Taiwo, Alonge and Obono (2005) asserted that limited access to up-to-date journals and books in the different disciplines had been a great challenge to researchers until the development of Internet. However, with the introduction of information communication technologies (ICT) and the concept of global village, research is no longer complicated. This is due to the fact that most of the documents to be consulted for research are available in electronic resources like the Internet, CD-ROM, OPACs, electronic journals and electronic books. University students now retrieve vast amount of information for their literature from electronic resources. This opinion is corroborated by Adeyemi (2002) who explained that electronic literature is very useful for research students due to the vast amount of data it contains. The huge amount of information at their disposal enable students to have an in depth view of the research topic. Sturges and Chimseu (1996) revealed that downloading information from database or CD-ROMs is efficient use of scarce funds. Adeyemi (2002) explained further that electronic resource like the CD-ROM aids in the reduction of financial problem for the researcher because the CD-ROM does not incur telecommunication charges.

Research requires originality and this leads researchers to retrieve information from remote computers around the world through the Internet. The Internet, which is an important resource for students research work is regarded by Oyegade (2000) as the best Channel of information retrieval because it is the gateway to the globe. It has allowed

different groups of people especially researchers to create channels of communication and self-expression. According to Thomas (2004), the Pew Research Center in 2001 reported that 94% of teenagers with access to Internet rely on online information for research tasks and 71% of them used the Internet as the major source for their most recent school projects. 58% of the students have used websites set up by the school or a class, 34% have downloaded a study guide while 17% have created a web page for a school project. George et al (2003) in their study revealed that half of all graduate students (50%) use the Internet to search for online papers or articles, research papers, white papers, journal articles and/or writing papers.

The use of electronic resources encourages collaboration among researchers. Magara (2002) opined that the emergence of the World Wide Web (www) enhance scholarly communication and a rise in computational science. Presently, many university students rely on the web for their assignments, research and communication with their teachers. Giving credence to this view, Deubel (2003) revealed that students at NOVA southern university were taught an online course and students were able to submit their assignments, have forums for discussions and e-mailed the instructor and each other through the course website. Research students through the web exchange ideas and information which can help the researcher. Omekwu (2003) writing on legal education and research in the digital age implied that university students' work would no longer be suspended or delayed because of the absence of their supervisors on sabbatical. Omekwu declared that owing to communication platforms like e-mails legal scholars and students can interact and continue with supervision of the research work. Furthermore, Fakolujo (2005) explained that "Electronic mail (E-mail) over the Internet enables researchers to overcome many barriers to communicate due to geographic distance such as time, costs and language". Fakolujo further revealed that virtual research teams can be formed to link a variety of researchers to enable them to contribute their skills to the project. Furthermore, Bamiro, Oluleye and Tiamiyu (2005) posited that the electronic mail (E-mail) mode of communication in the Internet helps researchers to send and receive messages at a very fast and cheap rate. Also, the bulletin board presents researchers the opportunity to browse information that may be useful for their work.

Ureigho, Oroko and Ekuyota (2006) explained that besides the use of Internet for e-mail, one can listen to international radio stations on research and education on the Internet. Furthermore a researcher can read books and other materials, speak to press round the globe and read national dailies of other countries. Moreover, through electronic resources university students retrieve information about research developments such as research grants, findings, conferences and meetings. Research grants reduce the financial burden on the researcher. Also information on conferences and meetings expose students to new ideas and information from other people. Giving credence to this view, Bamiro, Oluleye and Tiamiyu (2005) revealed that researchers need to subscribe to different list services in their areas of research so as to obtain information about research developments such as research grants, findings, conferences and meetings.

Electronic resources are in fact the vistas to retrieving up-to-date information for research. Undergraduates now utilise electronic resources to retrieve information for academic purposes such as class assignments, project work, seminar presentations and conferences. Egberongbe (2011) indicated that a large number of users were using electronic resources for research, study and for keeping abreast with new developments in their areas of interest. Through electronic resources students are able to gain in depth background knowledge of the topics. Adequate background knowledge of research topics selected by students assist them to remain focused on the topic. Lack of background knowledge can result in digression from the original idea or change of topic. Fidel et al (1999) revealed that students frequently changed their topics rather than finding suitable alternatives to describe the topics originally chosen. Also Moore and St George (1991) Solomon (1993) and Irving (1995) cited in Thomas (2005) discovered that students who lacked background knowledge of their topics were unable to pose appropriate search questions. They also could not select appropriate search terms. In addition, electronic resources are used by university students to retrieve information on proper use of information systems and databases for research purposes. Sullivan and Seiden (1985) cited in Thomas (2005) identified knowledge of information systems, databases and their organisations as one of the needs of students searchers. The information system is very complex and lack of knowledge in that area probably inhibits students' retrieval of

information for research. Therefore, students may not be able to choose the databases appropriate for their topics or utilise them in an appropriate order.

In a study carried out to measure the usage of e-journals by researchers at Aligarh Muslim University (AMU, Aligarh, India), Raza and Upadyyay (2006) revealed that most of the researchers used electronic resources such as, e-journals for their research work. They further revealed that a large number of the researchers were storing the e-journal articles by downloading them onto discs. This was due to lack of training and the problem of slow downloading. Borrego, Anglada, Barios and Comellas (2007) indicated that 52% of the respondents from the consortium of Academic libraries of Catalonia indicated that they exclusively use e-journals for their work. Also 53.6% of the respondents consult e-journals for both research and teaching. Similarly Achonna (2008) in a study of awareness, access and usage of e-journals resources revealed that 12.4% of the respondents made use of the e-journal frequently for academic activities. However 53.1% of them indicated that they do not use the resources at all due to problems such as time constraints, negative staff attitude, not being satisfied with the information they got and lack of skill to utilise the e-resources. Monnawwer and Shah (2007) cited in Sharma (2009) wrote that 67.64% of research scholars of faculty of science and 69.23% of research scholars of engineering use e-journals for research activities. According to Egberongbe (2011), e-resources were preferred by the respondents because they were more useful, time saving, easy to use, more informative and less expensive. Despite the gains of the use of electronic resources for research, many students are still faced with the problem of skill in retrieving information. This may cause a reduction in the quality of research work.

2.5 Concept of Information Retrieval and Search Strategies for Electronic Resources

The term information retrieval was coined in 1952 but gained popularity in the research community from 1961 onwards. Information retrieval according to Sutcliffe (1996) is a process of searching records or documents to find items which may satisfy the information need or interest of an individual or group. Modern information retrieval deals with storage, organisation and access to text, as well as multimedia information

resources. With the appearance of databases containing bibliographic details of documents, information retrieval has come to mean retrieval of bibliographic information from stored databases. Rowley (1998) posited that information retrieval was traditionally designed to provide access to information as distinct from documents which originally, was achieved through bibliographic databases. Rowley further explained that there are information retrieval applications which include online search services, the Internet and CD-ROM. These applications are for easy access and downloading of information.

In his book on online retrieval, Vigil (1988) stated that strategy and planning are very significant in information retrieval. Strategy is seen to be important when the data stored in the system are to be manipulated and combined in some manner. Also, Vigil expressed the view that search aids are used to simplify the procedure of the search process like formulating a simple query as a facet of a search. However the combination of the sets and their interpretation which may determine how the search proceeds has to come from the user. Collantes (1995) posited that in information retrieval the user is the central component of the information retrieval interaction. Collantes opined that communication between the user and information retrieval system could be problematic if there is a possible mismatch of index and search terms, that is, if the indexer and user do not use the same words for the same concept.

There is an information retrieval system which is designed to retrieve the documents or information required by the user. The retrieval system is supposed to make the right information available to the right user. Blair (1990) explained that this data retrieval system operates by directly answering the user's question which leads to retrieval of actual information desired. According to Chowdhury (2004), there are two broad categories of information retrieval systems which are the in-house and on-line retrieval systems. Chowdhury further revealed that the major functions of an information retrieval system are; to identify the information (sources) relevant to the areas of interest of the target user's community, analyse the contents of the source (documents), match the search statement with the stored database and retrieve the information that is relevant.

Rowley opined that there are three key stages in information retrieval. These are; accepting as input a query formulated by the records in a database, producing it as output for consideration by the user and retrieval of a set of records identified on the basis of this

comparison. However, Sutcliffe (1996) posited that there are six major components of an information retrieval process. They are: the set of records or documents, the indexing or access methods for the document set, the information need of the user. Others are verbalisation of this need in a sequence of search statements or menu selections, the sequence of items presented as a result of the search strategy and the degree to which the retrieved set satisfies the user's need.

Writing on modern information retrieval Baezo-Yates and Rubeiro-Neto (1999) revealed that many people retrieve information through keywords. They also warned that retrieval based on keywords might be of fairly low quality. They noted that the keywords generated for a given document may not summarise its semantic content. Baezo-Yates and Rubeiro-Neto explained that the reason for this is that the users query might be composed of too few terms which usually implies that the query context is poorly characterised. Information retrieval speed is also of importance. Blair (1990) opined that the speed of retrieval is dependent primarily on the physical access speed of the system being used. Adesanya (2002) posited that the creation of inverted file is a mechanism for increasing retrieval speed. Adesanya further explained that searchable elements are brought out of every record and entered into a file in a way that will allow fast matching of search request against the entries in the file.

Another important aspect of information retrieval is the search terms. Bates, Wilde and Siegfried (1993) revealed that appropriate search terms are used to retrieve desired information. They explained that the search terms used by humanities scholars are different from the type of search terms used by those in the physical sciences. The search terms used by humanities researchers are mainly geographical terms, chronological terms, names of works and individual names while the physical scientists used subject terms or common terms. In a related literature Hsieh-Yee (1993) wrote that for the same information problem, the selection and manipulation of the experienced searcher differs from that of the novice. Macpherson (2002) advocated for a concept-based approach for information retrieval. In her study of a group of 254 first year undergraduates of the University of Canberra, Australia, the group was taught information retrieval from electronic databases using teaching strategies grounded in learning theories. She discovered that a concept-based approach is more effective than a

traditional skills demonstration approach in increasing knowledge of the search process and in improving search outcomes. According to Bates (1986), Borgman (1986), Lancaster et al (1994), Saraceric (1971), Spink (1991) cited in Macpherson (2002), failure to identify appropriate concepts is one of the main reasons for search inadequacy.

Proctor (2002) observed that correct spelling is also very essential in locating information because large amount of pertinent information can be lost due to usage. He explained that a search of the New York Times on the Web finds 19,693 hits for the spelling 'on-line' but only 7,243 for 'on-line' spelled without a hyphen. The difference in usage resulted in the failure to access over 12,000 documents.

Retrieving relevant information for research may require undergraduates' frequent patronage of their libraries so as to use the electronic resources. The frequent use of the electronic resources would give the students the opportunity of increasing their speed and skill. It would equally lead them to discover options that would best suit them in retrieving their information needs. However, there are five basic elements in electronic resources which academic information seekers require. They are accessibility, timeliness, readability relevance and authority (Kibirige and Palo, 2000). The research student should use strategies which can help in achieving the five basic elements. There is the need for students to have a good understanding of a search process as this would improve the search outcomes. Macpherson (2002) referred to Penhale and Taylor (1986) who found out that the major problem faced by novice searchers is the development of a good search strategy. Vigil (1988) opined that using strategy is a two-fold process. The first process, he explained, is to know what to do while the second process is to know when to do it. Knowing what to do and when to do it are important in information retrieval for instance, for database search. Aina (2004) opined that the student can use a single term or a combination of terms. He advised that a single term should be used if it will appropriately retrieve the needed information for the student. However, the student should realise that the combination of terms may be more appropriate.

Okpala and Igbeka (2004) observed that some users use multiple databases while searching for information. They, for instance, maintain two or three databases at a time to obtain information. However, the major need of the user is to identify the search terms, the synonyms, the broader and narrower terms. The user may further specify the types of

data to be searched for, such as, title, author, descriptors and other entries. These may be grouped together (Greaves, 2002).

Adesanya (2002), Greaves (2002) and Aina (2004) wrote on the Boolean logic (OR, AND, NOT), a mechanism used for search accuracy which allows the inclusion of all synonyms and related terms. The Boolean operators, they explained are often used to narrow or broaden a user's search. Adesanya, Greaves and Aina stated that the operator OR (additive) indicates that either one or the other or both terms may be present in the document: AND (intersection) means that both terms must be present in the document while NOT (subtractive) indicates that the presence of the term makes the document irrelevant.

Truncation is another useful search strategy. Adesanya (2002) remarked in her work that in any given system, certain characters are approved to designate truncation. In Adesanya's view, the dollar sign ($) is widely used in most systems but Aina (2004) pointed out that truncation includes an asterisk (*) and a plus (+) after a single word. However, Rowley (1998) asserted that the truncation is sometimes available in the middle of words. Truncation, Rowley explained can be useful to cater for alternative spellings, for example, NA$IONAL will search for records with NATIONAL and NACIONAL. Also Mutshewa (2008) wrote on Wildcards which he described as symbols that are used to substitute for characters in words. The letters S and Z in organisation could be substituted by Wildcards for instance, Organi?ation. This would aid in retrieving information with both spellings.

There are also proximity features which according to Aina (2004) are used in combination of terms. There is proximity ADJ (Adjacent) which indicates close proximity and allows the terms being searched to be near each other. Aina further explained that when a user requires a combination of terms in the same sentence, the symbol SEN is used.

For online searching, Siddiqui (1997) declared that it is an extremely powerful information search tool. This is due to its capability of performing a search of millions of records in a few minutes thereby saving a researcher's time. On-line search process involves a dialogue between a searcher and a computer which is connected to the host computer through telecommunication link. Adesanya (2002) and Moahi (2002) reported

that for on-line database, it is possible to connect to the database providers and search the different databases that they provide.

Search engines such as Yahoo, Lycos, Excite, Infoseek, Alta vista and Google are the main search tools used for Internet search (Greaves, 2002, Moahi, 2002 and Aina, 2004). They explained that the user chooses the one that is the best for his area of interest and once the appropriate keywords are applied there is always a positive result. There are some specialised search tools called meta-search programs which allows for flexibility and control over the process of searching the Internet. Moahi (2002) revealed that the meta search agents provide quick and easy way to assess which search engines retrieve the best result in a search. A good example of a meta-search program is copernic which allows researchers to work with more than 90 categories of search engines and provides access to a total of more than 1000 individual search engines (Greasley, 2006). Awe (2004) revealed that copernic is outstanding when it comes to a research work because copernic can query many search engines, directories, usenet records and e-mail databases in a single search.

Furthermore Greasley (2006) wrote that some of the features offered by a meta-search program include:

- Hyperlinks that can be validated so that no time is wasted in attempting to load pages or access websites that no longer exist.
- Searches can be saved with or without any results that were previously returned.
- Searches can be scheduled so that they are carried automatically at any time chosen by the user.
- The results of a search can be sorted into different orders, according to factors such as relevance, the date of each page and so on. Results can also be filtered to remove unwanted items.

The strategy used in retrieving the information can reduce tension for a research student who may not have the time to indulge in trial and error. Undergraduates can also suffer from information overload caused by simple keywords searches yielding too many items. Therefore the undergraduates need to know how to define their needs and select

appropriate strategies to retrieve information. Selecting the appropriate strategy can help to reduce the retrieval of unrelated literature which can be frustrating for the researcher.

2.6 Information Retrieval, Skills Acquisition and Utilisation of Electronic Resources

Undergraduates with need of materials for research work will utilise the electronic resource if they are available in their libraries. However skill is a prohibiting factor in retrieving the information in the retrieval system. Skill is defined by Webster's New Collegiate Dictionary (1980) as the familiarity that is gained through actual experience; practical skills; as a knowledge of life. Also, skill is the ability to bring about some end result with maximum certainty and minimum outlay of time and energy. A novice can perform a job but will not be able to perform it consistently due to lack of skill. However, with experience or skill he can perform the job consistently and also be able to isolate relevant cues. Skilled performers know the exact information to attend to and are better able to detect false cues while a novice can be easily distracted by irrelevant information. Therefore, skills acquisition is important for retrieval of the exact and relevant information for student's use. According to Kari (2004) skills required to use electronic resources are higher than the one required for searching printed sources. Therefore students must acquire and master certain skills to exploit and utilise the growing range of e-resources (Kari, 2004).

Skills can be acquired formally or informally. Formal skills are acquired through courses in institutions where the skills are taught while informal skills can be acquired through friends, self-taught or personal arrangement with people who are experts in that particular field of study. In a study on Internet usage by Ojoko and Asaolu (2005) 67.9% of the students acquired skills through teaching by friends, 39.3% through self teaching while 20.7% acquired their skills by reading of books. Also, studies by Ojedokun (2001) revealed that most students acquired skills in Internet access and usage through friends while about 23% of the respondents said they never used the Internet. However, Gui (2007) posited that to retrieve information in the open web, that not only formal information skills are needed but substantial information skills (especially in the first parts of the session). Gui further revealed that to retrieve information successfully users

have to create appropriate queries on search engines, select results efficiently on the basis of their quality and know where to look for resources.

Thomas (2004) observed that sophisticated computer skills do not automatically translate into skills in search and retrieving of information. He noted that the ability to assess for oneself "what is enough" is an important skill which can help users. This is because less experienced information seekers will find excessive search output intimidating. This can affect their use of electronic resources and the user will not eagerly approach the system to retrieve information. Hargittai (2002) in his study of online skills defined skill as the ability to complete a task and the amount of time spent for completing it. Students with less experience in skill may spend too much time retrieving information due to problems they may encounter when seeking information in electronic resources. Some of these problems as stated by Thomas (2004) are that:

- Students lacked knowledge of database design
- Students' difficulties in accessing materials are compounded in electronic settings.
- Students had problems with mechanics of online searching
- Students' difficulties with literacy skills were transferred to electronic settings.
- Students' lack of background knowledge made selection of search terms difficult.
- Students lack of background knowledge limited ability to select appropriate databases
- Students lack of knowledge of search process and search strategies hampered their search.

Skills in information retrieval are important owing to the fact that it enables the students to use the electronic resources. The use of electronic resources according to Bialo and Sivin-Kachala (1996) will enhance both the self-confidence and the self-esteem of students. Furthermore, the retrieval skills of the students will have to be demonstrated before information can be retrieved from the electronic resources. The information retrieval skills of the university students can be demonstrated by students recognising their need for information and being able to operate the computer. Students should also

be able to evaluate bibliographic search strategies, select the right search strategies for the search and be able to evaluate search results. However, information is constantly changing with millions of data concealed in remote places. This presents problems for undergraduates who may need the concealed information for research activities and learning. This problem may be due to their lack of skills to retrieve needed information. Many of the undergraduates enroll in the universities with little or no knowledge of information retrieval skills; therefore, they need to acquire these skills for speedy retrieval of information. The retrieval skills which undergraduates need to acquire include informational retrieval, operational retrieval and strategic retrieval skills.

Informational retrieval skill of the students include the ability to recognise information need for the research, distinguish ways of addressing gap and construct strategies for locating the information stored in the electronic resources. Undergraduates with informational skill should be able to locate and access information by being able to perform literature searches for whatever is required for one's curriculum or course of study. Also students should compare and evaluate the information retrieved from the different electronic resources. Furthermore, students should be able to organize, apply and communicate the information retrieved to the satisfaction of their tutors. However, undergraduates need to be guided to acquire these skills so as to cope with the information intensive world. Wordnet Dictionary (2004) defined skill as "an ability that has been acquired by training". Therefore, one can refer to acquisition of skills as ability that has been obtained by training.

Zaiton (1993) cited in Teh (1997) pointed that retrieval skills are often assumed. He revealed that traditional library skills taught students location skills while retrieval skills were not taught. Zaiton further opined that 'except for isolated cases information skills are not formally taught. However Gui (2007) posited that there is need to teach information skills. He opined that intensive efforts must be made to teach information skills to meet up with the "hurried pace of information technology development". Giving credence to this view, Ahmed and Cooke (2008) wrote that utilisation of electronic resources and the improvement of information skills require continuous training programmes for end users. Also, Kari (2004) opined that libraries must prepare short courses on information skills for students so that they will be equipped with the

knowledge to cope with information. Teaching of information skills equipped students with the needed information for research purposes.

Operational retrieval skill is the ability to exhibit some level of competence in the use of computers and the network connections. Frequent interactions with the computational mechanism of the hardware and software would help the students to be competent in information retrieval. According to Okello-Obura and Magara (2008) 95.8% of the respondents in their study indicated that for improvement of accessibility and utilisation of e-resources at Makerere University, computer skills of students should be improved. Xie (2007) however explained that students past experiences might affect the way they interact with the computer. Saunders (2008) asserted that information cannot be retrieved if one cannot operate the system, which is the computer. Lack of operational skills pose challenges for students to retrieve information to accomplish their research goals. A study on Health care personnel's use of e-information sources in Riyadh governmental hospitals by Ahmed and Cooke (2008) revealed that many of the staff acquired computer skills from colleagues and friends. The analysis showed that 40.2% of respondents had received computer training which is expected to enhance their use of e-information sources in the hospitals. Baniontye and Vaskevicene (2006) revealed that 89.7% of research libraries and 65% of public libraries in Lithuania provide regular training for their readers. There was immediate increase in the number of users after such training. According to Mutshewa (2008), skill is improved through practice and frequent use of information retrieval system. Mutshewa pointed out that there is need for well-defined development programmes that could help people to be competent in the use of information retrieval system. Therefore he called for the provision of appropriate training programmes for users. Training is associated with improvement. Ray and Watson (2003) cited in Haliso (2007) observed that training of workers appears to be associated with high level of productivity. In the same way, training of students would improve their search skills and ultimately enrich their research work.

Students' improvement in search skills could speed up the whole information search process (Chu and Law, 2008). They further revealed that possession of search skills could equally contribute to a more effective and comprehensive search. However students might map out strategies to ascertain the process that would best retrieve the

exact information needed for his goal. For students to be competent in retrieving information, they may exhibit different search strategies such as finding new ideas to reformulate their queries if the result fails to provide relevant information. Students need to use appropriate search tools for information retrieval. Also, they need to know when to stop a search. Xie (2007) opined that a user has to decide when to quit a retrieval process after "obtaining complete information, enough information, partial information, or just by frustration". According to Okello-Obura and Magara (2008), majority of their respondents learnt to access electronic resources and acquired database search skills through self-taught. However Bates (1979b) advised that information providers should assist users in their searches by suggesting or teaching strategies they could use when their search strategies do not produce the desired results. Chu and Law (2008) in their longitudinal study on the development of information search expertise of research students discovered that students had problems in finding relevant information sources. Also that the students needed to achieve a competent level of expertise in order to effectively locate information. Therefore they opined that students should be trained on information sources, databases and information search skills. They further advised that the training should be tailored to the specific needs of the students. Chu and Law (2008) explained that there is the need to carefully space the training so that students have time to digest the materials learned. Furthermore various search skills such as truncations and proximity search should be included in the training provided for students. Lucas and Topi (2004) discovered that there were improved search results when searchers had minimal training in Boolean logic. According to Murdock et al (2007) cited in Saunders (2008) many people articulate their needs in natural language. However they revealed that majority of search engines rely on keyword queries and Boolean logic.

In order to effectively retrieve information students should be taught to value and implement information retrieval skills effectively as this would have an effect on how students find and use information, concepts and ideas for their assignments (Herring, 2010). Also users should have appropriate instructions and frequent activity with electronic information system (Oliver, 1997). Furthermore users have to interact with variables like data, knowledge, concept, format, location, system and human beings (Xie,

2007). These steps would enhance the informational, operational and strategic skills required for information retrieval.

2.7 Challenges of Information Retrieval and Utilisation of E-resources by University Students

Utilisation of e-resources for research may depend on information retrieval. There are however, several challenges encountered in retrieving information, such as, constant power failure, frequent down time of server, lack of skills to use the e-resources, costs of charges and of printing are expensive, in adequate staff to help students, impose of access controls, and few computer terminals. Ray and Day (1998) Posited that 10.5% of respondents in their study stated that limited access to a computer terminal hindered their academic career. Despite the number of computer centres opening, students still appear to experience difficulties in locating a terminal (Ray and Day, 1998). Jansen (1997) identified factors such as scarcity of computers, limited training and lack of skilled manpower as some of the challenges of use of ICT in Africa. These factors would also impede the utilisation of e-resources because if computers are few and there is limited training on information retrieval, the e-resources would not be utilised. Also lack of skilled manpower would affect information retrieval since there would be no skilled personal to guide in the information retrieval process. The resultant effect of this is that e-resources may not be utilised for research.

Ali (2005) cited in Egberongbe (2011) pointed that 60% of users while browsing electronic information faced numerous problems such as, lack of knowledge about the resources, lack of trained staff and inadequate terminals. Oduwole and Akpati (2003) also named insufficient number of terminals and inadequate electricity supply as some of the constraints of users in accessing and retrieving electronic information. Similarly, Chisenga (2004) cited in Egberongbe (2011) opined that four barriers to the effective provision of electronic resources in libraries are; lack of strategic planning, lack of adequate or reliable funding, lack of use of the Internet to provide information services to users and lack of consistent training for users in new ICT services. Also a study conducted by Ajuwon et al (2003) on uptake of ICTs by health science students in university college hospital Ibadan included lack of awareness, lack of access to

computers and insufficient training as some of the barriers faced by students. Similarly, Fordjour, Badu and Adjei (2010) observed that the challenges of information retrieval among students are inadequate time for retrieving information, difficulty with frequent disruption of the Internet access service and difficulty in locating relevant information. According to Fordjour, Badu and Adjei (2010), students' inadequate time to retrieve information can be attributed to taking other activities on campus more importantly than concentrating on improving their information retrieval skills to obtain relevant information for their academic work. Furthermore, they opined that the problem of inadequate time probably may be because of lecturers' inability to encourage their students to make extensive research outside what has been taught in the classroom. This leads to students' reproduction of lecture notes rather than being encouraged to use information retrieval tools to acquire extensive knowledge (Fordjour, Baddu and Adjei, 2010).

Norris (2004) Opined that the greatest barrier to e-resources is impose of access controls for users. Users are sometimes expected to pay a subscription fee or agree to license condition. This would pose a great challenge because information may not be retrieved or utilised due to the restriction. Also Ehikhamenor (1993) attributed the failure of automation in Nigeria to frequent break down of the computer caused by frequent power failure. Giving credence to this view, Nwalo (2000) revealed that Power supply in Nigeria is so erratic that it is generally believed that it is normal to have 'black out' and abnormal to have uninterrupted power supply for up to one hour. Owing to frequent computer breakdown caused by epileptic power supply, it may be difficult to retrieve information which would be utilised for research.

According to Ray and Day, (1998) limited time and lack of effective information retrieval skills are barriers to utilisation of electronic resources. The free library (2011) indicated lack of time, lack of knowledge and problems with networking as some of the reasons for non use of e-resources. Moreover there is the problem of low bandwidth which disrupts the use of the Internet in Nigeria. The capacity of the channels in Africa needs to be increased for the servers to work effectively. Until solutions to these problems are proffered information and lack of effective information retrieval skills students would not be able to retrieve relevant information for research purposes.

2.8 Perceived Ease of Use of Electronic Resources for Research by University Students

Perceived ease of use of electronic resources by university students is a determining factor that can encourage or discourage students from the use of electronic resources for research. The belief that the use of electronic resources is easy would encourage students to use the resources. Also if they are able to retrieve information without complications they would continue to use the resources even for research. Giving credence to this view Brown (2002) opined that students acceptance of technologies depend to a large extent on their perceived ease of use. Brown further explained that perceived ease of use is really significant in developing countries where fresh students admitted into the university may have had limited prior exposure to computer and Internet technologies. Davis (1989) in his Technology Acceptance Model revealed that perceived ease of use has a significant influence on usage of and intentions to use a technology.

Anandarajan, Igbaria and Anakwe (2002) posited that perceived ease of use is a necessity in technology use. They also argued that fewer complications and complexities will bring about favourable perception of the resources being used. External variables such as self-efficacy, perceived usefulness, ease of finding, training and users discipline influence perceived ease of use. Lederer et al (2000) cited in Brown (2002) affirmed that ease of finding and ease of understanding predict perceived ease of use of a website. Ramayah and Bushra (2004) revealed that self-efficacy directly influences perceived ease of use. The study explained that as students become more familiar with the use of the computer, using new applications (e-library usage) will be perceived as much easier. Ramayah and Bushra (2004) also advised that library management should embark on information dissemination programs to highlight the usefulness of the electronic resources available on their website to students, especially during orientation period. Furthermore lecturers in the universities should be change agents in influencing the attitude of students to electronic resources.

Brown (2002) is also of the opinion that ease of finding, ease of understanding, self-efficacy and computer anxiety influence perceived ease of use of web-based technology. In other words students' apprehension to use electronic resources and lack of

confidence would influence perceived ease of use of the electronic resources. However, if they discover that it is easy to find information in the e-resources they would be encouraged to use them for research. A survey of 78 first year South African university students with little prior experience of Internet technologies indicated individual characteristics of self-efficacy and computer anxiety as factors that influence perceived ease of use (Brown, 2002). Ren (2000) also explained that people are more interested in performing activities in which they have high self-efficacy. Ren's study revealed that if people feel comfortable with computers, they will use them and if they feel that learning library's resources will enhance their academic performance, they will learn how to use them. Waldman (2003) pointed out that students who express interest in learning about the library's electronic resources will be more likely to have self-efficacy. However, Waldman (2002) revealed that one obstacle to the use of library electronic resources are the perception that they are not straightforward. This can be frustrating for students and would discourage their use of electronic resources.

In the same vein, if students feel confident about the use of electronic resources or if they perceive them as easy and important for their research activities, they would use them for their research work. Furthermore Covi (1999), Eason et al (2000), Kling and Mckin (1998), Tenopir (2003) and Torma and Vakkari (2004) believed users discipline and institutional context affect the use of electronic resources. Also, Eason et al (2000) and Torma and Vakkari (2004) opined that "academic users" perception of the contents (including both coverage and relevance) of electronic journals and ease of use of the system affect pattern of use of electronic resources. Liu and Grandson (2002) cited in Ramayah and Bushra (2004) revealed that perceived ease of use is positively influenced by self-efficacy and task performance but they found that the influence becomes weaker when users are given prior training. On the other hand, it was discovered that training doesn't influence self-efficacy of an employee but hands on training exert significant differences in self-efficacy and perceived ease of use (Venkatesh and Davis 1994).

Prior experience also influence perceived ease of use. In support of this view, Park, Lee and Cheong (2007) explained that individual instructors' perception of electronic learning systems and prior teaching experience may facilitate or inhibit use of such systems. Park, Lee and Cheong's study further revealed that perceived ease of use of

electronic courseware would have a positive effect on perceived usefulness and behavioural intention to keep using the electronic courseware. Similarly, perceived ease of use of electronic resources would affect perceived usefulness. Students would perceive the electronic resources useful if they receive prior training or have had pleasant experience on their first trial of electronic resources use. According to Valentine (1993) cited in Waldman (2003), undergraduates looked for the fastest way that would lead to satisfactory results. During research, students tend to go for electronic information first but they feel uncomfortable asking for help in the library, thereby spending frustrating hours trying to find information. However, Straub, Keil and Brenner (1997) posited that relationship between perceived ease of use, perceived usefulness and actual usage differs from one culture to another. Therefore, in order to encourage Nigerian undergraduates to use library electronic resources, especially for research we need to find out the factors that influence and enhance their use of electronic resources. If the problems are solved students would be encouraged to use the electronic resources for research.

2.9 Demographic Variables and Utilisation of Electronic resources

Demographic variables such as age, gender, user's course of study and faculty influence, level of education, income, employment and others have been assumed to determine utilisation of e-resources. According to Waldman (2003) age or gender did not have any effect on students' use of the library's electronic resources though he indicated that other studies found gender as a major predictor of Internet use and attitudes. Younger generations have been brought up with computer and as such, it is easier for them to utilise e-resources. However Older and returning students may not have had as much exposure to computers, resulting in increased computer anxiety (Waldman, 2003). Similarly Kjerulff et al (1992) Cited in Agbonlahor (2008) indicated that a study of nurses in a medical school revealed that Older Nurses tended to be more technology anxious than younger ones. Students with computer anxiety may find it difficult to utilise e-resources due to fear of computer usage. Furthermore Laerum et al (2001) opined that Medical doctors with similar educational backgrounds showed no difference in utilisation of electronic resources in terms of sex and age.

Gender is another factor relevant in Utilisation of electronic resources. Venkatesh and Morris (2000) Cited in Agbonlahor (2008) found that males had more positive attitudes towards the use of computers than females. Also a study of high school students revealed that their computer use and attitude towards computers tended to vary by gender but the difference tended to diminish with computer experience (Sacks et al 1994) cited in Waldman (2003). Majid and Abazova's (1999) study on faculty members indicated that males have better computing skills than females. Furthermore, the study found that age and year of obtaining highest educational qualifications were also important factors in establishing computer skills.

According to Wilberly and Jones (1994) Cited in Agbonlahor (2005), a study of IT adoption behaviour of eleven humanist scholars over a five year period revealed that scholars in the humanities adopted new technologies slowly than scientists and social scientists. This conclusion was made because they observed that the humanists in their study had potential to expand their use of IT but only six had gone beyond word processing. Scheonfeld and Guthrie (2007) stated that laboratory scientists make extensive use of electronic resources while the humanists depended more on primary sources, monographs and other traditional library collection. Attitudes and perceptions of economists were similar to those of humanists in 2000. They depended on the print journal and library resources. However, in 2006 economists seemed to have moved to electronic environment and they now rely more on electronic formats (Scheonfeld and Guthrie (2007). Tenopir also revealed that 97% of psychology students reported that they access the Internet at least weekly. Furthermore they used the Internet 44% of the time for educational information while more than three-quarters say they begin their research through the Internet. In a study of use and non-use of email by faculty members in a US university, Mitra et al. (1999) cited in Agbonlahor (2008) discovered that though users and non-users differed in their attitudes towards computers, the differences were not significant by discipline. A study of faculty's use of electronic resources discovered that there is "significant relationship between computing skills and use of electronic resources in the library, including the Online Public Access computer or OPAC and the library's online catalogue" (Majid and Abazova 1999). Scheonfeld and Guthrie (2007) revealed that only a minority of faculty members use e-books. According

to their study 16% of their faculty members reported often or occasional use, 36% reported rare use, 13% view e-books as very important for research or teaching today while 24% expect them to be very important five years from now. Furthermore 37% of faculty members use the Internet daily, 52% use the Internet for educational purposes (Patitungkho and Deshpande, 2005).

Level of education, income and employment has also been found to affect ICT and indirectly use of electronic resources. For instance, Olatokun (2009) posited that there are socio-demographic differences that affect access and use of technologies such as, age, sex, location, income and others. Olatokun (2009) further opined that the higher the incomes and the level of education the higher the number of people that will have access to information technology. Also, Al-Hammadany and Heshmati (2011) revealed that educational level determines capacity for Internet use. They explained that a well-educated group would use the Internet than those with low-level of education. Giving credence to this view, Mukoko (2012) pointed out that households' use of media centres would increase with the level of education of household head or children. Also, Mukoko (2012) explained that education and employment affects the adoption of ICTs. This is owing to the fact that constant use of ICTs in the workplace and /or in education provides exposure in the environment and adoption of ICT.

Furthermore, employment, age effect and enrollment in education lead to higher Internet access (Mukoko 2012). According to Rogers (2003), the adopters of new technology are typically younger people with good income and appropriate level of education and more reactive to new innovation than non-adopters.

Madden and Savage (2000) found that the individual who tended to use Internet early in Australia were younger males, with high level of income and education.

2.10 Theoretical Framework

The primary reason for provision of e-resources in university libraries is to aid learning teaching and research activities. To achieve these purposes, students must learn how to optimally utilise e-resources, especially for research. There are many studies and theories related to utilization, however, the theoretical framework of this study is based on Bandura's (1977) social Learning theory.

The social learning theory posits that people learn from one another through observation, imitation and modeling. The theory stated that "most human behaviour is learned observationally through modeling from observing others, one forms an idea of how new behaviors are performed and on later occasions this coded information serves as a guide for action". Bandura gave necessary conditions for effective modeling such as, Attention, Retention, Reproduction and Motivation. The theory revealed that various factors such as distinctiveness, effective valence, prevalence, complexity and functional values, increase or decrease the amount of attention paid. Also, one's characteristics, for instance, sensory capacities, arousal level, perceptual set, past reinforcement can affect attention.

Retention which is remembering what you paid attention to includes, symbolic coding, mental images, cognitive organisation, symbolic rehearsal and motor rehearsal. Reproduction that is reproducing the image includes physical capabilities and self-observation of reproduction. The theory indicated that Motivation which is described as having a good reason to imitate includes motives such as a past (i.e traditional behaviourism), promised (imagined incentives) and vicarious (seeing and recalling the reinforced model).

The relevance of this theory to the study is that students' utilisation of library e-resources may depend on students' ability to observe new behaviour, such as, utilisation of electronic resources. Observation of new behaviour requires students to be attentive in order to learn the new behaviour. Also, students are expected to retain or remember what they observed and at a later time being able to reproduce what they learnt. The ability of reproducing all that have been learnt probably would motivate students to utilise what they learnt. In other words, undergraduates may learn utilisation of electronic resources through observing others. Furthermore, undergraduates are expected to be attentive, retain what they learnt and be able to reproduce all that they learnt about electronic resources. The resultant effect of this is a probable favourable perception of the ease of use of electronic resources. If undergraduates perceive electronic resources as easy to utilise, they would probably not consider the constraint of demographic variables. This would ultimately motivate undergraduates to utilise electronic resources for research.

Davis (1989) Technology Acceptance Model is relevant to this study. The Technology Acceptance theory posits that a user's acceptance of any technology is based on perceived usefulness and perceived ease of use. The model explained that usefulness

and perceived ease of use will have a significant impact on a user's attitude towards the use of the system which may be feelings of favourableness or unfavourableness towards the system. A student who discovers the usefulness of the use of computer technology as a means of retrieving information for use in research may not be able to utilise the technology due to ease of use. Therefore, the student may require skills to be able to use the technology.

The Cognitive/Behavioural Theory on skills presupposes that cognitive/ behavioural approach may improve performance by altering the individual thoughts or cognitions. The theory states that biases, memories and individual beliefs may influence the development of proficiency skills. The theory states further that behaviour can facilitate the gaining of knowledge in certain environments and some behaviours may offer a greater potential for the acquisition of knowledge. This theory therefore holds that educating an individual to focus on a particular cue in performing motor skill is important in the cognitive behavioural approach. Possession of skills would enable students to identify search strategies which would hasten the retrieval process.

Ellis (1989) cited in Thomas (2004) revealed some useful research strategies to assist searchers in locating sources and finding information during the search process. Ellis search strategies are relevant for information retrieval. His research strategies include 'starting', 'chaining', 'browsing', 'differentiating', 'monitoring' and 'extracting'. The 'starting' include identifying key articles and key authors in bibliographies, abstract, indexes, and catalogues, "chaining" is the strategy for using citations as clues to other information on the same topic. Ellis explained that "Browsing" is a semi directed searching of resources and books in an area of potential interest. Ellis further revealed that using differences between sources to indicate their nature and quality should make the searchers to "differentiate" among the alternatives to select those that are the most useful. "Monitoring requires the searchers to see that the most recently published information in a field is not overlooked while "extracting" entails the systematic perusal of each source if not overlooked.

Furthermore, Zahner (1992) cited in Macpherson (2002) developed a cognitive strategies framework which emphasized the process of the search rather than the use of information sources. Zahner opined that there is the need to view searching as a problem-solving process. He introduced a "Focus, Format, Find and Evaluate" strategy for searching. The focus phase is for generation of search question; the format phase is for

choosing appropriate information sources to research the question, such as journals, books or newspaper. The find phase concentrates on generating strategies to find relevant information while the evaluate phase is based on evaluating the quality of located sources using a checklist.

For this study therefore, a conceptual model was adapted from Davis' (1989) Technology Acceptance Model with modifications from the researcher.

CONCEPTUAL MODEL

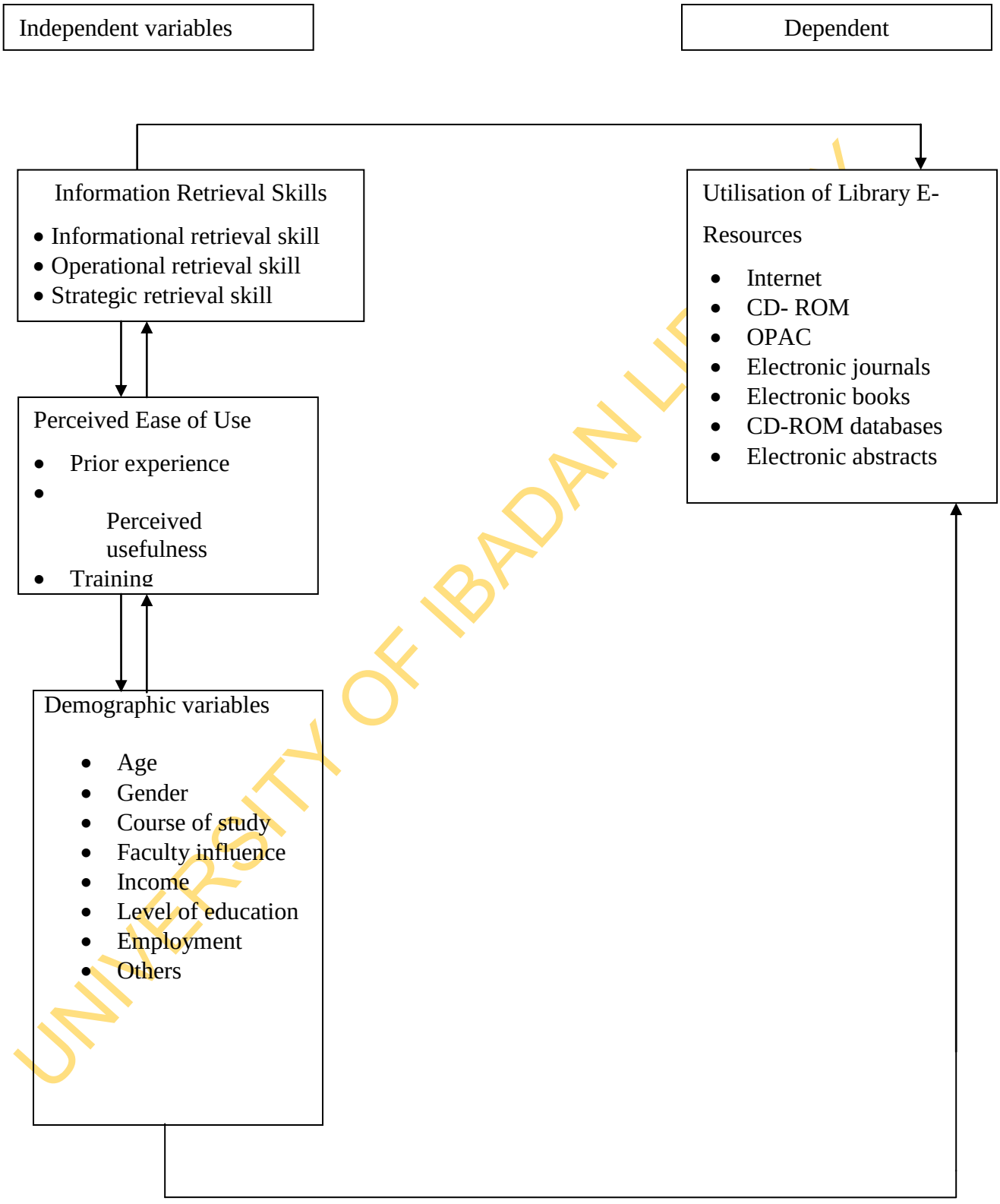

***Fig2. 1**: Conceptual model for information retrieval skills, perceived ease of use, demographic variables and utilisation of electronic resources (adapted from Davis' 1989 TAM).*

The conceptual model of this study assumed that the variables of information retrieval skills, perceived ease of use and demographic variables may enhance the utilisation of library electronic resources for research. Information retrieval skills (informational, operational and strategic skills) are linked to perceived ease of use and demographic variables. In other words, information retrieval skills of undergraduates, their perception of the ease of use of e-resources and demographic variables may determine the use of library e-resources positively or negatively. Also the model shows interlinks between use of library e-resources, demographic variables, perceived ease of use and information retrieval skills. This may indicate that use of library e-resources may also be determined by demographic variables of undergraduates, their perception of the ease of use of e-resources and their information retrieval skills. Undergraduates with information retrieval skills may perceive the e-resources as easy to use while those without the skills may not have favourable perception of the ease of use of electronic resources. Also perceived ease of use which is influenced by factors such as prior experience, training, and perceived usefulness may be constrained by demographic variables which may determine undergraduates' utilisation of library e-resources for research. Undergraduates with the three retrieval skills, prior experience, training, perceived usefulness and demographic variables of age, gender and course of study may perceive the use of e-resources as easy and probably may be encouraged to use them for research. If for instance students' prior experience of utilising electronic resources is favourable, it may motivate students to utilise electronic resources for research. In addition courses of study that have constant interaction with electronic resources and acquisition of training on utilisation of electronic resources may also enhance undergraduates' utilisation of library e-resources which includes OPACs, e-journals, e-books, the Internet and CD- ROM databases. Furthermore, the links indicated that use of e-resources may depend on the demographic variables which may result in the favourable or unfavourable perception of the ease of use of library e-resources which ultimately may enhance or hinder the acquisition of the three retrieval skills.

2.11 Appraisal of Literature Review

The literature explored the skills in information retrieval and utilisation of electronic resources through subheadings such as; electronic resources for information retrieval, an overview of the use of e-resources, availability and utilisation of e-resources in Africa and utilisation of e-resources for research.

Also, the literature revealed that Africa is still behind in electronic resources development and use. Furthermore the review discussed the concept of information retrieval, retrieval strategies and retrieval skills. It revealed that adequate knowledge of the search process, search strategy and appropriate search terms are important for retrieval of information. The literature further pointed out that informational, operational and strategic skills are required to retrieve information from e-resources. It explained that skills can be acquired through training formally or informally for them. The literature review revealed that search strategies used for CD-ROM search include Boolean operators and truncation features. OPACs can be searched through author, subject, shelf list and others while Yahoo and Google are some of the search engines used for Internet search. In this study, the literature pointed out perceived ease of use as another factor that determines students' use of library electronic resources. It also indicated the variables that influence perceived ease of use. Furthermore, the literature review revealed that demographic variables of age, gender and course of study of students may enhance the utilisation of e-resources.

However, none of the literature reviewed related information retrieval skills, perceived ease of use and demographic variables to undergraduates' utilisation of e-resources for research in Nigeria. This created the gap of inadequate local examples to cite for researchers in the study area. Therefore, this work is necessary to fill the gap and to provide a reference point for future studies.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focused on the steps and strategies that were utilised for data gathering and analysis for the study.

3.1 Research Design

The descriptive design of the correlational type was adopted for this study. This is because all the variables of interest had already occurred and the researcher only measured them and reported. The study also adopted the survey method. This method was adopted because surveys are usually used to study a population from which a sample is drawn. Also, according to Kerlinger and Lee (2000) cited in Adetimirin (2008), survey research determines the incidence, distribution and inter-relatedness among sociological and psychological variables and usually focuses on vital facts, beliefs, opinions, attitudes, motivations and behavior of people.

3.2 Population of the Study

The target population of this study is 400 level undergraduates in ten federal universities in Nigeria. There were twenty-seven federal universities as at the time the researcher determined the population of the study. The estimated total population of 400 level students in the ten (10) universities covered in the study was Forty-nine thousand three hundred and eighty- three (49,383). The population of study is shown in Table 3.1.

Table 3.1 Universities and Population of the Study

	Universities	Population of the study
1	Ahmadu Bello University, Zaria	7205
2.	Bayero University, Kano	4303
3.	Obafemi Awolowo University, Ile- Ife	6567
4.	University of Ibadan	2497
5.	University of Jos	3417
6.	University of Lagos	5442
7.	University of Maiduguri	6403
8.	University of Nigeria, Nsukka	5851
9.	University of Port Harcourt	3677
10.	University of Uyo	4021
	Total	49,383

Population of the study : National Universities Commission, 2008.

3.3 Sample and Sampling Technique

The multi-stage sampling technique was adopted for this study in order to achieve a good representation of the population. There were four stages involved in the sampling. First, ten (10) universities which is about thirty- seven percent (37%) of the twenty-seven federal universities in Nigeria were randomly selected using balloting method. The ten (10) universities were selected randomly so as to ensure that all members of the population had equal chances of being selected. Another reason for selecting ten universities is to obtain a sample that is not very large or cumbersome for sound conclusions.

Secondly, in each of the ten (10) universities, three (3) faculties were purposively selected on the basis of their being available in all the selected universities. The faculties selected were Arts/Humanities, Science and Social Sciences.

Thirdly, two (2) departments each were selected from each of the selected faculties using the random sampling technique by balloting. These varieties of departments were selected to have a broad spectrum of courses for this study and to allow for objectivity. Also, there is likely to be less variability in students' characteristics within just one or two departments than between several departments. The departments selected were Religious Studies, Philosophy, Communication and Language Arts, French, Linguistics, History, Arabic, Theatre Arts, English, and Literary Studies, Foreign Languages, Classics, Music, Botany, Regional Planning, Demographics, Social Statistics, Microbiology, Zoology, Biochemistry, Chemistry, Biology, Mathematics/Statistics, Physics, Sociology, Geography, Economics and Political Science (Table 3.2).

Fourth year students were purposively selected from the departments. The selection of 400 level students was on the basis that due to their programme of study which is over a four year period, they may have used e-resources, which is one of the variables in the study, in writing their term papers and other research activities.

The total population of 400 level students in the selected departments in the ten (10) universities was three thousand seven hundred and ninety-nine (3,799). A sample fraction of 65% out of the total population of three thousand seven hundred and ninety-nine (3,799) was used in selecting the respondents for this study (Table 3.3). This gave a total sample size of two thousand four hundred and sixty nine (2,469). A sample fraction

of 65% was used because Wimmer and Dominick (1987) cited in Oyedum (2009) stated that a minimum sample size of 10% or 5% should be used for populations that are up to 10,000. Sample fraction was also used in this study so as to achieve a systematic selection. A representative sample size of 2,469 out of 3,799 was considered adequate since Krejcie and Morgan (1970) opined that a sample size of 384 could be used for a population of 200, 000.

Table 3.2 Universities, Faculties and Departments Selected for the Study

S/N	Name of University	Faculties		
		Art/Humanities	**Science**	**Social Science**
		Departments		
1.	Ahmadu Bello University, Zaria	English and Literary Studies French	Mathematics Chemistry	Political Science Economics
2.	Bayero University, Kano	History English	Zoology Physics	Sociology Economics
3.	Obafemi Awolowo University,Ile-Ife	Dramatic Arts Foreign Languages	Chemistry Geology	Demographic and social statistics Political Science
4.	University of Ibadan	Communication language Arts, Classics	Mathematics/Statistics Biochemistry	Psychology Geography
5.	University of Jos	Religious Studies English	Zoology Physics	Sociology Economics
6.	University of Lagos	Philosophy English	Botany/Microbiology Chemistry	Psychology Sociology
7.	University of Maiduguri	Languages/Linguistics Creative Arts	Physics Mathematics/statistics	Geography Sociology/ Anthropology
8.	University of Nigeria, Nsukka	English and Literary Studies History/International studies	Microbiology Botany	Political Science Sociology/ Anthropology
9.	University of Port Harcourt	Theatre Arts Religious and cultural Studies	Biochemistry Biological Science	Mass communication Sociology
10.	University of Uyo	English Philosophy	Botany/Ecological studies Mathematics/Statistics	Geography & Regional Planning Economics

Table 3.3: Population of 400 Level Students from Selected Departments and Sample size

S/N	University	Distribution				
		Sample		Arts/		Social
		Population	size	Humanities	Science	Science
1	Ahmadu Bello University Zaria	554	360	105	136	119
2	Bayero University Kano.	331	215	62	70	83
3	Obafemi Awolowo University	505	328	132	95	101
4.	University of Ibadan	192	125	43	47	35
5	University of Jos	263	171	69	60	42
6.	University of Lagos	419	272	94	96	82
7.	University of Maiduguri	493	320	80	124	116
8.	University of Nigeria Nsukka	450	293	123	92	78
9.	University of Port Harcourt	283	184	73	59	52
10.	University of Uyo	309	201	80	56	65
	Total	3,799	2,469	861	835	773

Population of 400 level students from selected departments: National Universities Commission, 2008.

3.4 Data Collection Instrument

A self structured questionnaire and an interview schedule were used to collect data for this study. The questionnaire method was used to elicit factual information. It was also used to identify prevailing conditions and practices. The interview method elicited information that were not included in the questionnaire. Through this method, the researcher was able to elicit explicit information from the respondents.

A questionnaire tagged Information Retrieval Skills and Utilisation of Electronic Resources Scale (IRSUER) was administered on the students. The questionnaire was divided into five sections (Appendix I).

Section A elicited information on the background of the respondents with items such as name of institution, course of study, department, faculty, and gender.

Section B collected data on the respondents' Utilisation of Library Electronic Resources (UOLER). The section contained questions on accessibility of electronic resources in university libraries and they were rated on a four point scale of easily accessible, very accessible, sometimes accessible and never accessible. There was also question on frequency of use of e-resources. This had a seven point scale of daily, once a week, twice a week, once a month, twice a month, occasionally and never.

Section C was on Perceived Ease of Use of Electronic Resources (PEUER). The items on perceived ease of e-resources were rated on four points response of strongly agree, agree, disagree and strongly disagree.

Section D investigated the respondents' Retrieval Skills for Electronic Resources Utilisation (RSFERU). This section posed item statements on respondents' knowledge of retrieval skills and they were rated on a five point scale of very poor, poor, average, good and very good.

Section E elicited information on Electronic Resources Skills Acquisition (ERSA).This section contained a question on acquisition of skill to retrieve information from electronic resources. This was also rated on a four point scale of strongly agree, agree, disagree and strongly disagree.

The researcher also used the interview method. An interview checklist was drawn up on issues such as electronic resources in the library, the databases available, training in the library on the use of electronic resources and students' perception of ease of use of electronic resources.(Appendix II).

3.5 Validity and Reliability of the Instrument

To ensure the face and content validity of the research instruments, the questionnaire was given to the researcher's supervisor and some lecturers in the field of Information Science in University of Ibadan. Thereafter, the questionnaire was corrected and a pre-test was done with 40 copies of the questionnaire which were randomly distributed to respondents drawn from the faculty of Education in University of Ibadan. The Education faculty was used because it did not form part of the study sample. After the pre-test, questions pertaining to the particular databases used by students in their libraries were removed. The Cronbach-Alpha method was used to determine the

reliability coefficient of the instrument and the value of 0.85 was obtained for Demographic variables, 0.87 for Utilisation of Library Electronic Resources, 0.91 for Perceived Ease of Use of E-resources, 0.94 for Retrieval Skills for Electronic Resources Utilisation and 0.75 for Electronic Resources Skills Acquisition.

3.6 Data Collection Procedure

The researcher engaged the services of twelve research assistants to make the administration and retrieval of the questionnaire less cumbersome. To be able to retrieve the questionnaire easily, organised administration of the questionnaire was done with the help of some of the class representatives in the departments. Also, some lecturers teaching compulsory courses assisted by encouraging the students to honestly complete their questionnaire since the outcome of the study may be of benefit to universities. All the copies of the questionnaire were collected on the spot and they were found adequate for analysis. Interviews were also conducted with the heads of electronic library units of the university libraries. Vital information were obtained from the respondents and notes were taken by the researcher during the interview. Data collection of this study started in May 2010 and ended in December 2010.

3.7 Data Analysis

Descriptive statistics of mean, standard deviation, histogram, frequencies and percentage distributions were used to analyse the research questions. The descriptive statistics was used because it gives simple summaries about observations and samples in a study. The hypotheses and relationship among the variables were tested with Pearson correlation coefficient and multiple regression analyses. Pearson correlation coefficient was used to show the relationship between the two variables, that is, the independent and dependent variables. The multiple regression analysis was also used to show the relationship between several independent variables and the dependent variable in the study. The interviewer collected data by cross examining the respondents and taking notes during the interview. The notes were later transcribed and used to support findings in the study. On the basis of the analyses, seven (7) hypotheses were tested in addition to drawing up inferences and conclusions. The tests were performed at 0.05 level of significance.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the results obtained from the study based on the demographic information, research questions and the null hypotheses. Two thousand four hundred and sixty nine questionnaires (2,469) were administered. The entire questionnaires administered were collected and were found to be properly completed and adequate for analysis. This represents a hundred percent (100%) response rate.

4.1 Demographic Information

The number and percentages of the students were sampled based on their age groups, gender and course of study. Age, gender and course of study have been presented as some of the determinants of undergraduates' utilisation of library electronic resources. It is believed that younger undergraduates utilise electronic resources more than the older ones. Furthermore, it is assumed that male undergraduates utilise electronic resources more than their female counterparts. Also, some undergraduates are believed to utilise electronic resources for research due to their course of study which probably, exposed them to constant use of electronic resources. The study therefore, examined the three variables (age, gender and co urse of study) as regards to undergraduates' utilisation of electronic resources for research.

The findings on demographic variable of age as shown in Table 4.1 revealed that the study had younger respondents than older ones.

Table 4.1 Age Distribution of the Students

Age(years)	Frequency	%
16 -20	653	26.4
21 -24	1273	51.6
25 -29	450	18.2
30+	93	3.8
Total	2469	100.0

Six hundred and fifty three (26.4%) students sampled were of 16-20 years of age. Also, ninety-three (3.8%) students were of thirty (30years) and above. However the data revealed that one thousand two hundred and seventy-three (51.2%) students were in the age range of 21-24. This figure does not indicate that students in 21-24 age brackets utilise library electronic resources for research more than students in other age groups. This probably reveals that the majority of students in the study were in their twenties.

The gender distribution of students revealed that more males were sampled in the study (See Table 4.2).

Table 4.2 Gender Distribution of the Students

Gender	Frequency	%
Male	1443	58.4
Female	1026	41.6
Total	2469	100.0

There were one thousand four hundred and forty three (1443) male students in the study. This represents 58.4% of the sample while the remaining one thousand and twenty-six (41.6%) were females. The implication of this is not that male students utilise electronic resources for research more than female students. It may mean that there were more male respondents than the females.

Another demographic variable that was discussed in the study is course of study and the findings are shown in Table 4.3.

Table 4.3 Distribution of the Students According to Course of Study

Discipline	Frequency	%
Humanities	871	35.3
Sciences	787	31.9
Social Sciences	811	32.8
Total	2469	100.0

Students sampled from the humanities were eight hundred and seventy one (35.3%). The courses presented in the table represents the variety of courses of study offered by students in the university and would enable the generalisation of the results obtained. Also the numbers revealed that higher number of the respondents were from the humanities.

4.2 Answers to Research Questions

This section provides answers to the four research questions in the study.

4.2.1 Research Question 1: What is the frequency of undergraduates' use of electronic resources in their university libraries?

The Library is the power house of any university. The university library houses all the materials needed for learning, teaching and research. Presently, electronic resources are provided in university libraries for speedy retrieval of current information for students' research work. There are several electronic resources used for research in university libraries. However, some of these electronic resources as identified in the study are, the Internet, CD-ROM, the electronic catalogue, e-journals, e-books, e-databases and e-abstracts. Electronic journals, e-books, On-line Public Access Catalogues (OPACs), and e-databases are accessible through the Internet. The Interne is available in most universities. Students in Humanities, Sciences and Social Sciences use electronic resources to retrieve information for research. Electronic resources such as On-line Public Access Catalogues (OPACs) are used to retrieve bibliographic information for research. Electronic databases are organised in particular subjects or multi-disciplinary subject areas. There are full-text or bibliographic electronic databases which students use for research. The bibliographic databases contains citation information such as author name, date, page, journal article and publication while full-text databases gives the content of an article like diagrams, text, citation information, illustrations and tables. The electronic journals and electronic books are also available for update of students' literature for research. There are also in-house CD-ROM databases but undergraduates rarely request for them for research purposes.

Undergraduates require electronic resources to boost their research. However, findings in table 4.4 revealed that the electronic resources were not frequently utilised.

Table 4.4 Frequency of Undergraduates' Utilisation of Electronic Resources

S/N	E-Resources	Daily (7)	Twice a week (6)	Once a week (5)	Twice a month (4)	Once a month (3)	Occasionally (2)	Never used (1)	Mean	Std Dev.
1	CD – ROM	170 (6.9%)	132 (5.3)%	125 (5.1%)	202 (8.2%)	227 (9.2%)	945 (38.3%)	669 (27.1%)	2.69	1.80
2	The Internet	707 (28.6%)	334 (13.5%)	207 (8.4%)	215 (8.7%)	240 (9.7%)	531 (21.5%)	235 (9.5)%	4.40	2.20
3	Electronic catalogues (OPAC)	62 (2.5%)	73 3.0%)	154 (6.2%)	214 (8.7%)	237 (9.6%)	689 (27.9%)	1040 (42.1%)	2.27	1.56
4	E-journals	92 (3.7%)	111 (4.5%)	132 (5.3%)	264 (10.7%)	251 (10.2%)	712 (28.8%)	907 (36.7%)	2.47	1.67
5	E- books	156 (6.3%)	102 (4.1%)	103 (4.2%)	144 (5.8%)	252 (10.2%)	751 (30.4%)	961 (38.9%)	2.43	1.77
6	E-databases	98 (4.0%)	65 (2.6%)	80 (3.2%)	199 (8.1%)	247 10.0%)	785 (31.8%)	995(40.3 %)	2.25	1.56
7	E-abstracts	70 (2.8%)	52 (2.1%)	86 (3.5%)	114 (4.6%)	188 (7.6%)	738 (29.9%)	1221 (49.5)	2.00	1.45

The level of use of electronic resources by students shows that the Internet was mostly used ($\bar{x}$= 4.40) followed by CD-ROM ($\bar{x}$=2.69). E-abstracts ($\bar{X}$ = 2.00) were the least utilised by the students. Of all, the Internet was most frequently used. All the other resources were occasionally utilised by students. The implication of this is that some of the students may not be aware of the existence of the electronic resources in their libraries. It may also imply that students lack the skill to utilise the electronic resources.

Another finding of the study is that undergraduates utilise electronic resources at different locations in their universities.(See Table 4.5)

Table 4.5 Location of Undergraduates' Utilisation of Electronic Resources

S/N	E-Resources	University library	Faculty Library	Department Library	ICT Centre on campus
1	Electronic catalogue (OPAC)	1141 (46.2%)	67 (2.7%)	205(8.3%)	1056(42.8%)
2	The Internet	534(21.6%)	69(2.8%)	303(12.3%)	1563(63.3%)
3	CD- ROM	698(28.3%)	220(8.9%)	253(10.2%)	1298(52.6%)
4	E-books	1009(40.9%)	180(7.3%)	342(13.9%)	938(38.0%)
5	E-journal	1139(46.1%)	189(7.7%)	200(8.1%)	941(38.15%)
6	E-databases	913(37.0%)	134(5.4%)	267(10.8%)	1155(46.8%)
7	E-abstracts	984(39.9%)	158(6.4%)	268(10.9%)	1059(42.9%)

The respondents utilised electronic resources at different locations. For instance, they utilised electronic catalogue (OPAC) mostly in the university libraries (46.2%) while the other electronic resources were utilised in other locations. The data revealed that students utilised electronic resources mostly in the university library and ICT center on campus. This probably indicates that the faculty and departmental libraries do not have most of the electronic resources which students require for their work.

Results on accessibility of electronic resources to undergraduates in University Libraries indicated that most of the electronic resources were not accessible to them. This is presented in table 4.6.

Table 4.6 Accessibility of Electronic Resources to Undergraduates in University Libraries

S/N	E-Resources	Easily Accessible (4)	Accessible (3)	Not Accessible (2)	Never Accessible (1)	$\overline{x}$	Std Dev.
1	Electronic catalogue (OPAC)	374 (15.1%)	659 (26.1%)	673 (27.3%)	763 (30.9%)	2.26	1.05
2	The Internet	620 (25.1%)	949 (38.4%)	499 (20.2%)	401 (16.2%)	2.72	1.01
3	CD- ROM	441 (17.9%)	720 (29.2%)	660 (26.7%)	648 (26.2%)	2.38	1.05
4	E-books	386 (15.6%)	565 (22.9%)	792 (32.1%)	726 (29.4%)	2.24	1.04
5	E- journal	373 (15.1%)	582 (23.6%)	765 (31.0%)	749 (30.3%)	2.23	1.04
6	E- databases	345 (14.0%)	588 (23.8%)	749 (30.3%)	787 (31.9%)	2.19	1.03
7	E-abstracts	204 (8.3%)	483 (19.6%)	814 (33.0%)	968 (39.2%)	1.96	.95

The Internet ($\bar{x}$=2.72) and CD-ROM ($\bar{x}$=2.38) were more accessible to the students. It also indicated that OPAC (x=2.26), e-books ($\bar{x}$=2.24), e-journals ($\bar{x}$=2.23), e-databases ($\bar{x}$=2.19) and e-abstracts ($\bar{x}$=1.96) were not always accessible. This implies that the Internet and CD-ROM were more accessible to students in the university libraries than the other e-resources. The inability of respondents in accessing the electronic resources listed probably means that they do not seek assistance from library staff to teach them how to access the electronic resources.

The data presented in table 4.7 revealed that undergraduates in humanities utilise electronic resources as much as others in sciences and social sciences.

Table 4.7 Utilisation of E-Resources Across Courses of Study of the Students

S/N	E-Resources	Humanities Mean scores	Sciences Mean scores	Social Sciences Mean scores
1	Electronic catalogue	2.64	2.74	2.70
2	The Internet	4.76	4.11	4.28
3	CD-ROM	2.19	2.37	2.27
4	E-books	2.38	2.51	2.53
5	E-journals	2.48	2.35	2.46
6	E- databases	2.14	2.37	2.27
7	E- abstracts	2.01	2.00	1.99
	Weighted mean	2.66	2.64	2.64
	N	871	787	8.11

The use of e-resources by undergraduates across the three courses as reflected in the mean scores yielded the highest weighted mean score of 2.66 in respect of Humanities, followed by science and social sciences students with 2.64 each. This indicates that the weighted mean scores were very close and revealed that the level of use of electronic resources by respondents was low when compared with the total score obtainable, which is 7.00,that is ,the total number of the resources listed. Also the mean scores indicated that the sciences used more of the OPACs, CD-ROMs and e-databases more than the humanities and social science. The humanities used more of the Internet, e-journals and e-abstract while the social sciences used e-books more than the humanities and sciences.

4.2.2 Research Question 2: To what extent do undergraduates utilise e-resources in research?

Undergraduates in universities utilise electronic resources for their research work. Also, they utilise electronic resources for class assignments. Electronic resources enable students to retrieve current literature for studies and to present standard academic work to their lecturers. However, findings revealed in table 4.8 that the extent to which undergraduates utilised electronic resources for research are not high.

Table 4.8 Undergraduates' Utilisation of Electronic Resources for Research

S/N	E-Resources	Always (4)	Sometimes (3)	Rarely (2)	Never (1)	Mean	Std Dev.
1	E-mail to friends about research	391(15.8%)	783(31.7%)	577(23.4%)	718(29.1%)	2.34	1.06
2	Browsing for research materials	1391 (56.35%)	662(26.8%)	172(7.0%)	244 (9.9%)	3.29	.97
3	Class assignments	1245(50.4 %)	759(30.7%)	269(10.9%)	196 (7.9)%	3.23	.93
4	Writing projects	842(34.1%)	757(30.7%)	321(13.0%)	549 (22.2%)	2.76	1.14
5	Chat with friends about research	501(20.3%)	707(28.6%)	597(24.2%)	664 (26.9%)	2.42	1.09
6	Communication with lecturers for research purposes	365(14.8%)	482(19.5%)	572(23.2%)	1050 (42.5%)	2.06	1.09
7	Retrieve current literature for studies	619(25.1%)	757(30.7%)	582(23.6%)	511 (20.7%)	2.60	1.07

The respondents rarely sent e-mail to friends about research ($\bar{x}$=2.34), chat with friends about research ($\bar{x}$ = 2.42) and they rarely communicated with lecturers for research purposes ($\bar{x}$=2.06). However, they sometimes browsed for research materials, used e-resources for class assignments, to write projects and retrieved current literature for studies. This finding could mean that students were not taught the uses and importance of electronic resources in research.

4.2.3 Research Question 3: What is the level of undergraduates' electronic information retrieval skills?

Undergraduates' knowledge of information retrieval skills is presented in table 4.9. The three skills; informational retrieval, operational retrieval, and strategic retrieval skills are needed by students to retrieve information. This is because one skill alone probably may not adequately retrieve information from electronic resources. For instance, if students have only informational skills they would not be able to retrieve information without the knowledge of operating computers or knowing the strategies of how to retrieve the right information. Also, having only operational retrieval or strategic retrieval skills without informational skill may hinder their retrieval of all the required information needed for research. Therefore, it may be vital for undergraduates to acquire the three skills to enable them retrieve the appropriate information for research.

Table 4.9 Undergraduates' Knowledge of Information Retrieval Skills
N = 2469

S/N	Skills	Very Good (5)	Good (4)	Average (3)	Poor (2)	Very poor (1)	Mean	Std Dev.	Group Mean
A	**Informational skills**								
1	Definition of your needs for research.	694(28.1%)	882(35.7%)	361(14.6%)	150 (6.1%)	382(15.5%)	3.54	1.36	
2	Locating information in e-resources.	481(19.5%)	744(30.1%)	606(24.5%)	273(11.1%)	365(14.8%)	3.28	1.30	
3	Selecting articles with ease.	406(16.4%)	681(27.6%)	674(27.6%)	264(10.7%)	444(18.0%)	3.13	1.31	
4	Summarising materials in your own words.	507(20.5%)	712(28.8%)	606(24.5%)	273(11.1%)	371(15.0%)	3.28	1.31	
5	Understanding terminologies used in databases.	212(8.6%)	535(21.7%)	838(33.9%)	411(16.6%)	473(19.2%)	2.83	1.21	3.17
6	Utilisation of reference sources to increase familiarity of topics.	303(12.3%)	591(23.9%)	748(30.3%)	395(16.0%)	432(17.5%)	2.97	1.26	
B	**Operational Skills**								
7	Use of mouse and keyboard.	845(34.2%)	567(23.0%)	416(16.8%)	262(10.6%)	379(15.4%)	3.50	1.43	
8	Copying information into your storage device such as flash drive and diskette	669(27.1%)	514(20.8%)	571(23.1%)	307(12.4%)	408(16.5%)	3.29	1.41	
9	Retrieving information from flash drive or diskette.	673(27.3%)	413(16.7%)	605(24.5%)	330(13.4%)	448(18.1%)	3.21	1.43	
10	Scanning images.	432(17.5%)	502(20.3%)	627(25.4%)	468(19.0%)	440(17.8%)	3.00	1.34	3.18
11	Access of on-line databases.	378(15.3%)	495(20.0%)	622(25.2%)	411(16.6%)	563 (22.8%)	2.88	1.37	
12	Download files from on-line databases.	421(17.1%)	793(32.1%)	557(22.6%)	309(12.5%)	389(15.8%)	3.22	1.30	
C	**Strategic Skills**								
13	Combining two terms to retrieve information.	179(7.2%)	471(19.1%)	706(28.6%)	548(22.2%)	565(22.9%)	2.65	1.22	
14	Use of truncation search techniques ($, *, +) to retrieve information	96 (3.9%)	386 (13.6%)	602(24.4%)	660(26.7%)	775(31.4%)	2.31	1.16	
15	Use of title search for electronic catalogue (OPAC) search.	150 (6.1%)	371 (15.0)%	538 (21.8%)	510(20.7%)	900 (36.5%)	2.33	1.27	
16	Use of author search for electronic catalogue (OPAC) search.	100 (4.1%)	535 (21.7%)	669 (27.1%)	504(20.4%)	664 (26.8%)	2.55	1.20	2.61
17	Shelf search for electronic catalogue (OPAC) search.	118 (4.8%)	522 (21.1%)	590 (23.9%)	535(21.7%)	704 (28.5%)	2.52	1.23	
18	Use of search engines such as Yahoo, Google, Alta Visa and Google scholar etc.	646 (26.2%)	626 (25.4%)	438 (17.7%)	279(11.3%)	480 (19.4%)	3.27	1.45	

Students informational skills were generally little above average (weighted mean $\bar{x}$= 3.17), this is out of a maximum obtainable score of 5.00. Also, the students had knowledge of operational skills which was also a little above average ($\bar{x}$=3.18). For knowledge of strategic skills, they were on the average ($\bar{x}$=2.58).Comparatively, students had higher operational skills than informational skills and strategic skills. It could mean that students retrieved information without adequate knowledge of the information they were looking for and ways in which the proper information could easily be retrieved.

The respondents in the study had negative opinions on electronic information retrieval strategies in all the items listed. This is presented in table 4.10.

Table 4.10 Perception of Undergraduates on Information Retrieval Strategies
N = 2469

S/N	Statement	SA (4)	A (3)	D (2)	SD (1)	Mean	Std Dev.
1	The use of a single term retrieves more information.	435 (17.6%)	825 (33.4%)	396 (16.0%)	812 (32.9%)	2.37	1.27
2	Combining two terms retrieves more information.	504 (20.4%)	750 (30.4%)	484 (19.6%)	730 (29.6%)	2.42	1.26
3	Use of dollar sign ($) is very important in retrieving information.	225 (9.1%)	573 (23.2%)	643 (26.0%)	1028 (41.6%)	1.99	1.00
4	The use of asterisk (*) is very important in retrieving information.	307 (12.4%)	546 (22.1%)	648 (26.2%)	968 (39.2%)	2.07	1.05
5	Proximity features (ADJ & SEN) are used often to retrieve information.	294 (11.9%)	600 (24.3%)	599 (24.3%)	976 (39.5%)	2.08	1.05
6	Title search is very useful for electronic catalogue (OPAC) search.	502 (20.3%)	686 (27.8%)	387 (15.7%)	894 (36.2%)	2.32	1.16
7	Author search is used more frequently for electronic catalogue (OPAC) search.	363 (14.7%)	711 (28.8%)	452 (18.3%)	943 (38.2%)	2.20	1.10
8	Shelf search is often used for electronic catalogues (OPAC) search.	314 (12.7%)	676 (27.4%)	497 (20.1%)	982 (39.8%)	2.13	1.07
9	Change of search terms is important when you do not retrieve relevant information.	551 (22.3%)	781 (31.6%)	362 (14.7%)	775 (31.4%)	2.44	1.14
10	Advanced search strategy is used to retrieve relevant information.	597 (24.2%)	703 (28.5%)	378 (15.3%)	787 (31.9%)	2.45	1.17

The mean scores ranged between 1.99 for item 3 to 2.45 for item 10. These fall far below the 3.0 score for agreement with the items which should have indicated positive opinions.

Though they agreed that change of search terms is important when you do not retrieve relevant information, they strongly disagreed on all the other items. It probably shows that the respondents lacked the information retrieval strategies because they should have given positive answers to the statements if they had the skills.

Another finding of the study is that the popular search engines utilised by undergraduates for information retrieval are Google, Yahoo and Ask. Also, it was discovered that undergraduates were satisfied with their use of the three search engines for information retrieval. (See table 4.11 and 4.12).

Table 4.11 Frequency of Information Retrieval through Search Engines
N = 2469

S/N	Search Engines	Very Often (4)	Often (3)	Rarely (2)	Never (1)	Mean	Std Dev.
1.	Google	1657(67.1%)	345(14.0%)	176(7.1)%	291(11.8%)	3.36	1.04
2.	Yahoo	1175(47.6%)	636(25.8%)	334(13.5%)	324(13.1%)	3.07	1.06
3.	Ask	703(28.3%)	673(27.3%)	452(18.3%)	641(26.0%)	2.58	1.15
4.	Others	556(22.5%)	505(20.5%)	480(19.4%)	928(37.6%)	2.27	1.18
5.	Google scholar	454(18.4%)	533(21.6%)	679(27.5%)	803(32.5%)	2.25	1.10
6.	Alta vista	325(13.2%)	376(15.2%)	456(18.5%)	1311(53.1%)	1.89	1.16
7.	Hot bot	350(14.2%)	346(14.0%)	411(16.1%)	1362(55.2%)	1.87	1.11
8.	Infomine	292(11.8%)	304(12.3%)	518(21.0%)	1335(54.9%)	1.81	1.05
9.	Lycos	315(12.8%)	340(13.8%)	394(16.0%)	1420(57.5%)	1.81	1.09
10.	Infoseek	250(10.1%)	379(15.4%)	460(18.6%)	1380(55.9%)	1.79	1.03
11	Metacrawler	212(8.6%)	362(14.7%)	428(17.3%)	1467(59.4%)	1.72	1.00

Out of the various search engines listed, the respondents used Google most ($\bar{x}$ =3.36). This was followed by Yahoo ($\bar{x}$ =3.07) and Ask ($\bar{x}$ =2.58) which they often used. The respondents rarely used all the other search engines like Google scholar, Alta vista, Hot bot, Infomine, Lycos, Infoseek and metacrawler. This result could be that undergraduates do not even know that some of the search engines are very good for research. Also they may not perceive some of the search engines as easy to use for information retrieval hence, the non-utilisation of those search engines.

Table 4.12 Undergraduates' Satisfaction with the Utilisation of Search Engines for Information Retrieval

N= 2469

S/N	Search Engines	Very satisfied (4)	Satisfied (3)	Not Satisfied (2)	Not Satisfied At all (1)	Mean	Std Dev.
1	Google	1269(51.4%)	757(30.7%)	198(8.0%)	245(9.9%)	3.23	.96
2	Yahoo	965(39.1%)	829(33.6%)	337(13.6%)	338(13.7%)	2.98	1.03
3	Ask	706(28.6%)	737(29.9%)	342(13.9%)	684(27.7%)	2.59	1.16
4	Others	498(20.2%)	614(24.9%)	393(15.9%)	964(39.0%)	2.26	1.17
5	Google scholar	355(14.4%)	750(30.4%)	538(21.8%)	826(33.6%)	2.25	1.07
6	Lycos	346(14.0%)	406(16.4%)	602(24.4%)	1115(45.2%)	1.99	1.08
7	Infoseek	286(11.6%)	459(18.6%)	647(26.2%)	1077(43.6%)	1.98	1.04
8	Alta vista	201(8.1%)	479(19.4%)	683(27.75%)	1106(44.8%)	1.90	.97
9	Hot bot	222(9.0%)	429(17.4%)	653(26.4%)	1165(47.2%)	1.88	.99
10	Infomine	198(8.0%)	398(15.8%)	671(27.2%)	1211(49.0%)	1.82	.96
11	Metacrawler	142(5.8%)	296(12.0)%	640(25.9%)	1391(56.3%)	1.67	.87

From Table 4.12, it would be inferred that students were satisfied with their use of Google ($\bar{x}$ =3.23), Yahoo ($\bar{x}$=2.98) and Ask ($\bar{x}$ =2.59). They claimed not to be satisfied with all other search engines. This may be attributed to the fact that they rarely used them (Table 4.11). Since students rarely used search engines such as Infomine, Infoseek, Alta Vista, Metacrawler, Hot bot and others, it is expected that they would not be satisfied with the use of the search engines. This is because they cannot be satisfied with what they rarely used.

Training on Information Retrieval from the University Library

The study tried to find out whether the respondents received training on information retrieval from their university libraries. The findings on training are revealed in Fig. 3.1and 3.2.

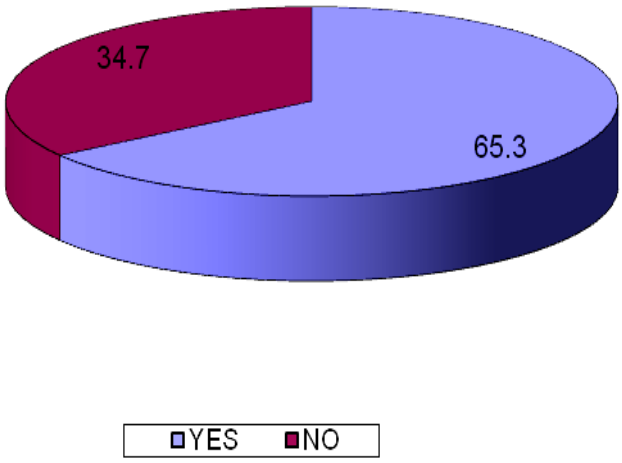

Fig 3.1. Distribution of the respondents on training on information retrieval from University Library

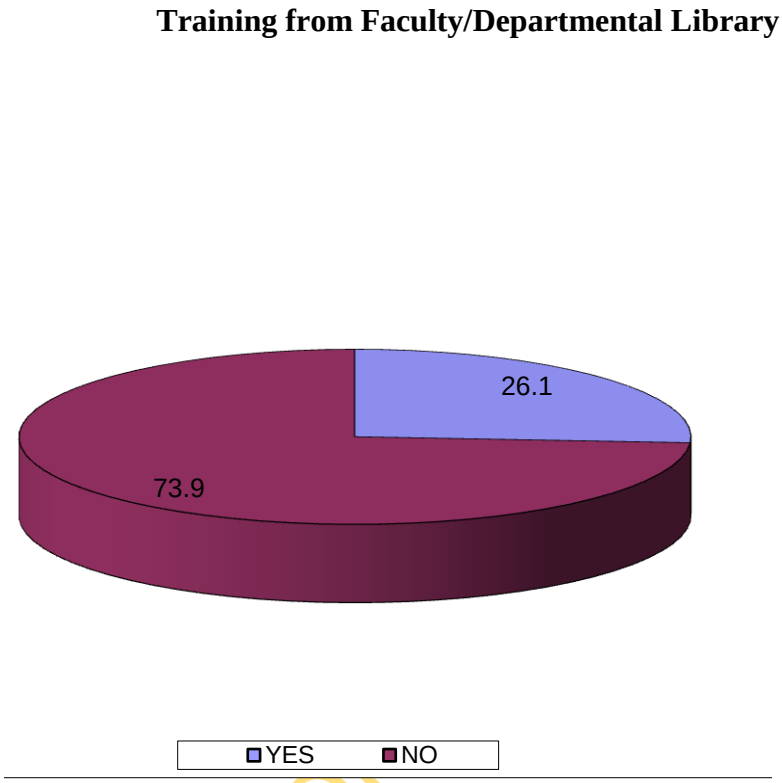

Fig 3.2. Training from Faculty/Departmental Library.

The charts on training avenues show that 1613 (65.3%) of the respondents received training on information retrieval from the university library compared with the 856 (34.7%) who did not. Hence, majority of the respondents had training on information retrieval from their university libraries. Furthermore, only 644 (26.1%) of the respondents received training on information retrieval from departmental/faculty libraries while 1825 (73.9%) were not trained in these locations. This implies that most departments and faculties did not provide training for their students on information retrieval.

Another finding of the study is that the respondents acquired their information retrieval skills. From other avenues instead of guidance from staff and faculty/departmental training. (See Fig.3.3).

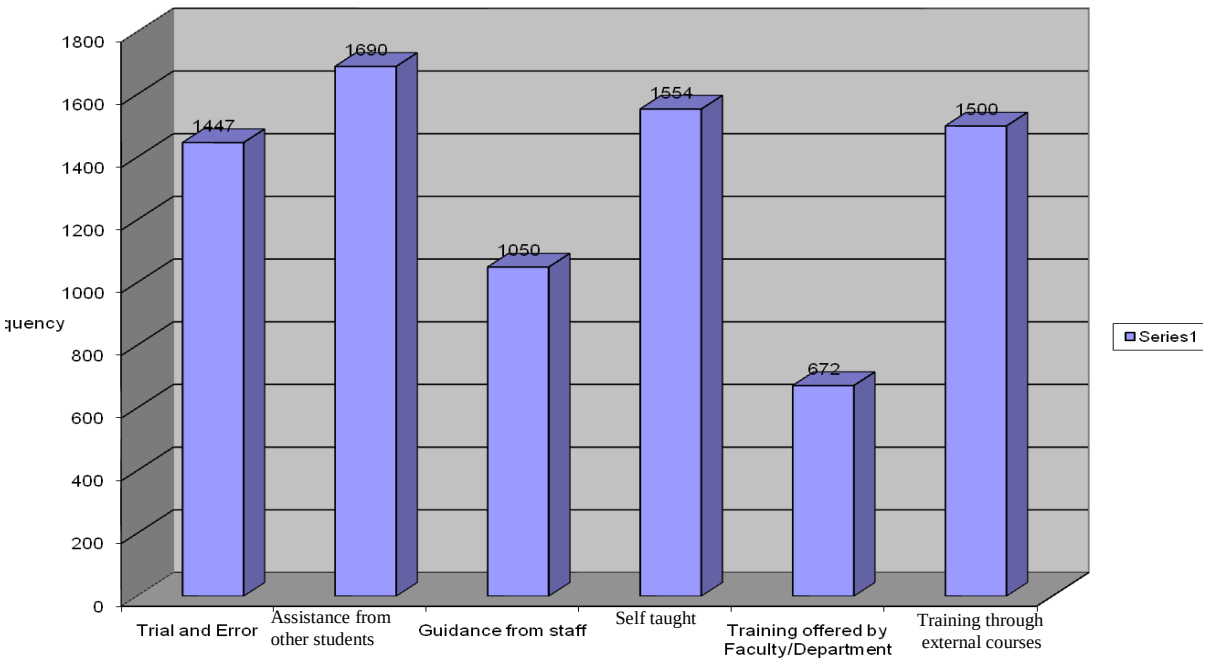

Fig. 3.3: Methods of Students' Acquisition of Information Retrieval Skills.

The graph shows that respondents acquired the little information they possess in information retrieval skills through assistance from other students (68.4%), self taught (62.2%) external training (60.8%) and trial and error (59.8%). The remaining avenues listed; guidance from staff (42.5%) and faculty/departmental training (26.2%) did not assist students much. This could mean that students do not seek assistance from library staff. It may also imply that the faculty/departmental libraries do not have the electronic

4.2.4 Research Question 4: What is undergraduates' level of perception of the ease of use of electronic resources?

Electronic resources are vital in the libraries owing to the fact that they provide academic and various types of information that aid in the overall growth of students. They also provide fun and entertainment for students. Electronic resources are most often provided in university libraries due to the large amount of information from remote places which can be used for students' educational outcomes. However, students may not perceive the use of electronic resources as easy to utilise and if they do not perceive it as easy, they may not utilise electronic resources for their research. The study therefore tried to find out undergraduates' perceived ease of use of electronic resources. This is presented in table 4.13.

Table 4.13 Undergraduates' Perception of E-Resources

N = 2469

S/N	Statement	SA (4)	A (3)	D (2)	SD (1)	Mean	Std Dev.
1	Electronic resources are very easy to utilise.	803 (32.5%)	1027 (41.6%)	313 (12.7%)	326 (13.2%)	2.93	.98
2	Electronic resources are complex and difficult to utilise.	241 (9.8%)	565 (22.9%)	1018 (41.2%)	645 (26.1%)	2.16	.92
3	Electronic resources is very difficult to access.	238 (9.6%)	523 (21.2%)	995 (40.3%)	713 (28.9%)	2.11	.93
4	E-resources are convenient for students to access.	615 (24.9%)	964 (39.0%)	479 (19.4%)	411 (16.6%)	2.72	1.01
5	The Internet is very easy to utilise for access to information for research.	1310 (53.1%)	624 (25.3%)	201 (8.1%)	328 (13.3%)	3.18	1.05
6	The Internet has helped me in access to information for class assignments.	1284 (52.0%)	625 (25.3%)	200 (8.1%)	360 (14.6%)	3.14	1.07
7	CD-ROMs are very easy to utilise.	521 (21.1%)	887 (35.9%)	547 (22.2%)	514 (20.8%)	2.57	1.04
8	CD – ROM has helped me in retrieving full-text articles for research work.	383 (15.5%)	789 (32.0%)	652 (26.4%)	645 (26.1%)	2.36	1.02
9	CD – ROM databases in my library are not relevant to my course of study.	551 (22.3%)	557 (22.6%)	592 (24.0%)	769 (31.1%)	2.36	1.14
10	Electronic books are easy to utilise.	580 (23.5%)	972 (37.5%)	504 (20.4)%	458 (18.6%)	2.65	1.03
11	Electronic books have provided access to new editions of books for my studies.	576 (23.3%)	833 (33.7%)	515 (20.9%)	545 (22.1%)	2.58	1.07
12	Electronic journals are easy to utilise for research	513 (20.8%)	970 (39.3%)	460 (18.6%)	526 (21.3%)	2.59	1.04
13	Electronic journals have helped in retrieving current literature for my research work	514 (20.8%)	795 (32.2%)	419 (17.0%)	741 (30.0%)	2.43	1.12
14	Access to electronic journals are always restricted.	516 (20.9%)	725 (29.4%)	566 (22.9%)	662 (26.8)%	2.44	1.09
15	Electronic catalogues (OPAC) has helped in building up my bibliography.	449 (18.2%)	794 (32.2%)	507 (20.5%)	719 (29.1%)	2.39	1.08
16	Electronic resources help in retrieving information for my project.	683 (27.7%)	870 (35.2%)	293 (11.9%)	623 (25.2%)	2.65	1.13
17	E- resources are not useful for my research work	291 (11.8%)	446 (18.1%)	637 (25.8%)	1095 (44.3%)	1.97	1.04
18	Information in e-resources is sometimes not readily available.	494 (20.0%)	862 (34.9%)	504 (20.4%)	609 (24.7%)	2.50	1.06
19	E-resources are easy for me to utilise because of my course of study.	584 (23.7%)	794 (32.2%)	562 (22.8%)	529 (21.4%)	2.58	1.07
20	E-resources are easy for me to utilise because of my faculty.	457 (18.5%)	668 (27.1%)	645 (26.1%)	699 (28.3%)	2.35	1.08
21	My department has no influence on my competence in electronic resources utilisation.	729 (29.5%)	601 (24.3%)	521 (21.1%)	618 (25.0%)	2.58	1.15
22	I am not satisfied with the databases available in my library.	765 (31.0%)	576 (23.3%)	397 (16.1%)	731 (29.6%)	2.55	1.20
23	I am satisfied with the databases available in my library.	327 (13.2%)	341 (13.8%)	524 (21.2%)	1277 (51.7%)	1.88	1.08
	Weighted average = 2.51						

As presented in table 4.13, out of the 23 statements, the perception of undergraduates on ease of use of E-resources, benefits derived and general views on electronic resources revealed that they expressed good opinions on 13 items with high mean scores of 2.50 to 3.18. For instance, the respondents were of the opinion that electronic resources were very easy to use (2.93), convenient for students to access (2.72), that the Internet was very easy to utilise for access to information for research (3.18), the Internet helped students in access to information for class assignments (3.14) and that CD-ROMs are very easy to use (2.57). Respondents also agreed that e-books were easy to utilise (2.65), electronic books provided access to new editions of books for studies (2.58), e- journals were easy to utilise for research (2.59) and that electronic resources helped in retrieving information for project (2.65). Furthermore respondents were of the opinion that information in e-resources were sometimes not readily available (2.50), electronic resources were easy for them to utilise because of their course of study (2.58), that department had no influence on students competence in electronic resources utilisation (2.58) and that they were not satisfied with the databases available in their libraries (2.55). The other 10 items yielded low mean scores of below 2.50 expressing negative opinions. The weighted average of 2.51 shows that their opinion is just about the 2.50 midpoint on the scale which shows that undergraduates' opinion of electronic resources were not very positive.

4.3 Hypotheses Testing

Seven null hypotheses were tested at 0.05 level of significance. They are described below:

4.3.1 Hypothesis 1: There is no significant relationship between retrieval skills and undergraduates' utilisation of electronic resources in university libraries.

It has been assumed that there is no significant relationship between retrieval skills and undergraduates' utilisation of electronic resources in university libraries. The study therefore attempted to find out the validity of the assumption. It was found, as presented in table 4.14, that there is a relationship between the two variables.

Retrieval skills have been grouped as:

a. Informational
b. Operational
c. Strategic

Table 4.14 Relationship Between Retrieval Skills and Utilisation of Electronic Resources

Variable	N	Mean	Std. Dev	r	df	Sig	Remark
Use	2469	61.66	14.79				
Inf. Skills	2469	19.07	6.64	0.242	2468	0.000*	Significant
Oper. Skills	2469	19.13	6.96	0.214	2468	0.000*	Significant
Strat. Skills	2469	18.08	6.54	0.353	2468	0.000*	Significant

*Significant at p < .05

The study found that the relationship between respondents' informational skills and use of electronic resources was positive, weak and significant (r=0.242; p<.05), which means that it did not have a high significance. This implies that if the respondents' informational skills improve their use of electronic resources in university libraries will also improve. Hence, 1a is rejected. Therefore, there is significant relationship between informational retrieval skills and undergraduates' use of electronic resources.

Operational skills have weak, positive and significant relationship with respondents' use of electronic resources (r=0.214; p<.05) however, it is not a very strong significance. This means that as operational skills improve, use of electronic resources also improves. Therefore, the null hypothesis for 1b is rejected because table 4.14 indicated that there is significant relationship between operational retrieval skills and undergraduates' use of electronic resources in university libraries.

Furthermore, strategic skills of respondents have a slightly weak, positive and significant relationship with use of electronic resources (r=0.353; p<.05). 1c is hereby rejected. This implies that increase in the strategic skills of respondents would lead to a corresponding increase in their use of electronic resources. This means that there is significant relationship between strategic retrieval skills and undergraduates' use of electronic resources in university libraries. The null hypothesis is therefore rejected.

4.3.2 Hypothesis 2: There is no significant relationship between perceived ease of use and undergraduates' utilisation of electronic resources in university libraries.

A hypothesis was formulated to test the significant relationship between perceived ease of use and undergraduates' utilisation of electronic resources in university libraries. This is depicted in table

Table 4.15: Relationship Between Perceived Ease of Use and Utilisation of Electronic Resources

Variable	N	Mean	Std. Dev	r	Df	Sig	Remark
Ease of Use	2469	38.49	16.96	0.343	2468	0.000*	Significant
Use	2469	61.66	14.79				

*Significant at p < .05

Perceived ease of use of electronic resources by the respondents has a slightly weak, positive and significant relationship with use of the resources (r=0.343;p<.05). This means that a positive perception of ease of use means improved level of use of electronic resources. The null hypothesis is therefore rejected. There is significant relationship between perceived ease of use and undergraduates' utilisation of electronic resources in university libraries.

4.3.3 Hypothesis 3: The three retrieval skills do not have significant composite effect on undergraduates' utilisation of electronic resources in university libraries.

Another finding of the study is that there is a significant composite effect of the three retrieval skills on undergraduates' utilisation of electronic resources in university libraries (See table 4.16).

Table 4.16 Summary of Multiple Regression of Retrieval Skills on Utilisation of Electronic Resources

R	**R Square**	**Adjusted R Square**	**Std. Error Of the Estimate**
0.357	**0.127**	**0.126**	**13.8315**

ANOVA for the Regression of Retrieval Skills

Source of Variance	Sum of Squares	Df	Mean Square	F	Sig
Regression	68816.736	3	22938.912	119.905	0.000*
Residual	471577.59	2465	191.309		
Total	540394.32	2468			

*Significant at p < .05

As presented in table 4.16, there is a positive multiple relationship among the three retrieval skills put together and respondents' use of electronic resources (R=0.357). The three retrieval skills are therefore relevant towards the determination of undergraduates' use of electronic resources. Also the adjusted R square value of 0.126 shows that 12.6% of the total variance in students' use of electronic resources is accounted for by the three retrieval skills which are, informational, operational and strategic skills. The remaining 87.4% is due to other factors and residuals. Table 4.16 tests for the significance of the R value. The ANOVA source test reveals that the F-ratio for the regression is significant (F=119. 905; P<.05). This means that the R value of 0.357 is not due to chance. The null hypothesis is hereby rejected. Therefore, there is significant composite effect of informational retrieval, operational retrieval and strategic retrieval skills on undergraduates' use of electronic resources in university libraries.

4.3.4 Hypothesis 4: The three retrieval skills do not have significant relative effect on undergraduates' utilisation of e-resources in university libraries.

Also another hypothesis in the study tested to find out if there is a significant relative effect of the three retrieval skills on undergraduates' utilisation of electronic resources in university libraries. This is presented in table 4.17.

Table 4.17: Contributions of Retrieval Skills to Students' Utilisation of Electronic Resources

Skills	Unstandardized Coefficients		Standardized Coefficients	Rank	T	Sig
	B	Std. Error	Beta			
(Constant)	46.082	.946			48.726	.000
Informational	.155	.067	.069	2nd	2.310	.021*
Operational	-2.480E-02	.062	.012	3rd	-397	.691
Strategic	.725	.053	.320	4th	13.720	.000*

- Significant at p<.05

The study found that strategic skills made the greatest contribution to respondents' use of e-resources (β=0.320; P<.05) which is significant to undergraduates' use of e-resources. Also informational skills made contribution of (β=0.069; P<.05) which is also a significant

contribution. Operational skills made the lowest and insignificant contribution (β=0.012, P<.05). On this basis, the hypothesis is rejected for strategic and informational retrieval skills but not rejected for operational skills. There is a significant relative effect of strategic retrieval and informational retrieval skills on undergraduates' utilisation of electronic resources in university libraries.

4.3.5 Hypothesis 5: The three retrieval skills and perceived ease of use do not have significant composite effect on undergraduates' utilisation of electronic resources in university libraries.

The findings of the hypothesis that tested on the composite effect of the three retrieval skill and perceived ease of use on undergraduates' utilisation of electronic resources in university libraries is shown in table 4.18.

Table 4.18

R	R Square	Adjusted R Square	Std.Error of the estimate
.434	.189	.187	13.3402

ANOVA Table for the Regression of Retrieval Skills and Ease of Use.

Source of Variance	Sum of Squares	Df	Mean	F	Sig
Regression	101898.69	4	25474.672	143.148	000*
Residual	438495.63	2464	177.961		
Total	540394.32	2468			

- Significant at p <.05

The study revealed that the 3 retrieval skills and ease of use correlate positively with use of e-resources (R=0.434). They also jointly contributed 18.7% of the variance in respondents' use of e-resources leaving 81.3% to other factors and residuals. The significance of the R-value and the ANOVA test reveals that the F-ratio for the regression is significant (F=143.148;p<0.05). It then means that the R value of 0.434 cannot be due to chance. Hypothesis 5 is therefore rejected.

There is significant composite effect of retrieval skills viz, informational, operational, strategic and perceived ease of use on undergraduates' use of e-resources in university libraries.

4.3.6 Hypothesis 6: The three retrieval skills and perceived ease of use do not have significant relative effect on undergraduates' utilisation of electronic resources in University Libraries.

The hypothesis that tested for the relative effect of the three retrieval skills and perceived ease of use on undergraduates' utilisation of electronic resources in university libraries revealed that the three retrieval skills and perceived ease of use contributed to undergraduates' utilisation of electronic resources in university libraries (See table 4.19).

Table 4.19 Contributions of Retrieval Skills and Ease of Use to Undergraduates' Utilisation of Electronic Resources

Factors	Unstandardized Coefficients		Standardized Coefficients	Rank	T	Sig.
	B	Std. Error	Beta			
(Constant)	39.833	1.021			39.022	0.000
Inf. Skill	0.142	0.065	0.064	3rd	2.195	0.028*
Opera. Skill	9.440E-02	0.061	0.044	4th	1.551	0.121
Str. Skill	0.463	0.054	0.204	2nd	8.501	0.000*
Ease of Use	0.233	0.017	0.400	1st	13.634	0.000*

Significant at p < .05*

The hypothesis found that ease of use had the greatest contribution to respondents' use of e-resources (β=0.400; P<.05). This is followed by strategic retrieval skills (β=0.204; P<.05). The third in rank of magnitude is the contribution by informational retrieval skills (β =0.064; P<.05). These three factors made significant contributions and hypothesis 6 is therefore rejected for informational retrieval, strategic retrieval and perceived ease of use. Operational retrieval skills however had no significant contribution (β=0.044; P<.05). Hence the hypothesis is not rejected for the factor.

4.3.7 Hypothesis 7: There is no significant relationship between the demographic variables (Age, Gender and Course of Study) and undergraduates' utilisation of electronic resources in university libraries.

Age, Gender and Course of Study have been believed to have relationship with utilisation of electronic resources in university libraries. Therefore, a hypothesis was formulated to test the relationship between demographic variables and undergraduates' utilisation of electronic resources in university libraries. The findings are presented in table 4.20.

Table 4.20 Relationship Between Demographic Variables and Utilisation of Electronic Resources

Variable	N	Mean	Std. Dev	r	df	Sig	Remark
Use	2469	61.66	14.79				
Age	2469	1.99	0.77	.006	2468	0.763	Not Significant
Gender	2469	1.42	0.49	-.013	2468	0.520	Not Significant
Discipline	2469	1.98	0.83	-.052	2468	0.010*	Significant

*Significant at p < .05

Age has no significant relationship with respondents' use of e-resources (r=0.006; p<.05) as depicted in table 4.20. Hypothesis 7 is therefore not rejected with respect to age. Also, gender has no significant relationship with use of e-resources (r=0.013; p>.05). The hypothesis is equally not rejected for gender. However, students' course of study has a negative, weak and significant relationship with use of e-resources (r=0.052; p<.05). Hence, hypothesis 7 is rejected for course of study. This means that course of study has significant relationship with use of electronic resources but the level of significance is not very high (0.010).

4.4 Interview

Also, the interview was conducted with the electronic librarians. Notes were taken during the interview and they were transcribed and presented in this study.

Results of Interviews Across Universities

I. Ahmadu Bello University

The librarian interviewed had 3 years experience in the electronic library unit. It was reported that the university has all the electronic resources listed in the study in their university library such as, OPAC, CD-ROM, e-abstracts, e-journals and e-books. The Internet is also accessible in the library. There are also online databases. There is an eLibrary and MTN virtual library where students can go for their information. Students in the University often use e-books, e-journals, AGORA, JSTOR and OARE. According to the librarian in the unit, the e-resources are readily available to students and students are given orientation and training in the library on the use of electronic resources and staffs in the unit are allowed to assist students in retrieving electronic information. The librarian was not yet sure about the perceived ease of use of electronic resources among undergraduates. However, it was reported that the students seemed satisfied with the electronic services of the library. The main problems are the epileptic power supply and poor funding. The library is making effort to attract assistance and funds from some bodies and efforts are ongoing to install standby generator.

II. Bayero University Kano

The University has electronic librarian with 5 years experience in the position. The Internet is available and there are a range of electronic resources such as, e-books JSTOR, OARE, AGORA and OPAC, e-journals and others. Students generally use all these available e-resources. Orientation programme is organized for fresh undergraduates and staff members provide assistance to students in the use of electronic resources. Hence, students perceive that the use of e-resources is easy and they exhibit high level of satisfaction with the electronic unit of the library. The only problem has to

do with power supply and generators. Efforts were being made by the university librarian to solve the problem.

III. Obafemi Awolowo University, Ile-Ife

The librarian in the electronic unit has 9 years experience. The university library has electronic resources which include Online and in-house CD-ROM, OPAC and many other e-resources. The Internet can be accessed in the library. Students in the university use all available e-resources partly due to the readiness of staff to help them always. Specifically, students were given fresh students' orientation, regular training and prompt attention by staff. Students see the use of e- resources as easy and satisfactory. The challenges listed include, inadequate staff and bandwidth. They have written to the management to assist in solving the problems by employing more staff and to increase the bandwidth.

IV. University of Ibadan

The electronic librarian has 5 years experience in the unit. The library has a collection of electronic resources ranging from EBSCOHOST, HINAR, JSTOR, OARE, AGORA, NIGERIAN VIRTUAL LIBRARY, e-books, e-journals and others UB, The students use all e-resources in the library. Despite the fact that all the electronic resources are made available to them, many students do not use them while some of them do not ask for assistance. Their poor use of some of these could be to lack of adequate awareness of the few resources not used. The students were given orientation as fresh undergraduates during initial registration and staffs are allowed to help them retrieve electronic information from time to time as students encounter difficulties. Also, those students that use e-resources find them easy and this could be linked to staff ready assistance and orientation. Students were also said to be highly satisfied with services provided in the unit. Challenges in the library include poor funding and insufficient staff in the unit. Efforts were being made to improve funding internally and through foreign bodies. Also, more staff were being trained for the unit.

V. University of Jos

The electronic librarian for the University library has spent 11 years in the position and the unit has electronic resources such as, OPAC, CD-ROM, online databases, electronic books and e-journals. Computers, printers, Students use e-books, e-journals, special collections, AGORA, JSTOR and OARE. The unit made all e-resources available to the students. The unit also gave training to students and organised orientation for fresh students on use of e-resources. The undergraduates perceive use of electronic resources as easy and satisfactory. The main challenge reported is power supply which was being ameliorated with the use of generators.

VI. University of Lagos

The electronic librarian interviewed has 6 years experience. The unit has a collection of e-resources such as EBSCOHOST, HINARI, JSTOR, OARE, AGORA, NIGERIAN VIRTURAL LIBRARY, e-books, e-journals, online database as well as other e-resources and accessories. Students use all these resources as they are all made available to them. Undergraduates are given fresh orientation on admission into the university and the library organises, periodic training for groups of students from time to time. Staff are also allowed to give necessary assistance to students who encounter problems in using e- resources.

Students were reported to be satisfied and they perceived the use of e- resources as easy. The two major problems are power failure and bandwidth. The university has installed new generators and the bandwidth will be changed to improve the situation.

VII. University of Maiduguri

The electronic section has a librarian with 3 years experience in the unit and has a good stock of e- resources. These include OPAC, electronic databases, OARE and e-journals. The Internet is accessible in the library.Students use e- books, e-journals special collections, among others. All kinds of e-resources are readily available to students across different disciplines. Orientation programmes, training and assistance by staff members

assist students in the efficient use of e- resources. Students perceive use of e- resources as both easy and satisfactory. The only problem cited is funding. To this end, more funds are being asked for from the university management.

VIII. University of Nigeria, Nsukka

The Librarian in the electronic section has 5 years experience. The library has a collection of electronic resources ranging from EBSCOHOST, HINAR, JSTOR, OARE, e-books, OPAC NIGERIAN VIRTUAL LIBRARY to electronic databases. Students use e- books, e-journals special collections, AGORA, JSTOR among others. All kinds of e-resources are readily available to students across different disciplines. Orientation programmes, training and assistance by staff members assist students in the efficient use of the e- resources. The main challenge reported is power supply which was being ameliorated with the use of generators.

IX. University of Port Harcourt

The electronic unit librarian interviewed has 3 years experience in the unit. The library has a good stock of e- resources. Students in the University use all available e-resources partly due to the readiness of staff to help them always. Specifically, students were given fresh students' orientation, regular training and prompt attention by staff. Students therefore see the use of e- resources as easy and satisfactory. Students were reported to be satisfied and they perceive the use of e- resources as easy. The two major problems are power failure and low bandwidth. The university has installed new generators and they are still waiting for the bandwidth to be increased.

X. University of Uyo

The University has electronic librarian with 4 years experience in the position and there are a range of electronic resources such as JSTOR, OARE, AGORA and OPAC e-databases, e-journals and others. The Internet is available and accessible to students. Students generally use all these available e- resources. Orientation programme is organised for fresh undergraduates and staff members provide assistance to students in the use of electronic resources. Hence, students perceive that the use of e-resources is

easy and they exhibit high level of satisfaction with the electronic unit of the library. The problem has to do with power supply and inadequate staff while generators and recruitment of new staff were being used to solve the problem.

4.5. Discussion of Findings

The discussion of findings addressed the vital issues raised in the research questions and the hypotheses that were formulated in the study.

4.5.1. What is the Frequency of Undergraduates' Utilisation of Electronic Resources in their University Libraries?

Findings on frequency of undergraduates' use of electronic resources revealed that the Internet and CD-ROM were more frequently used more than other e-resources. In fact 28.6% of the respondents utilised the Internet on a daily basis. Also 6.9% used the CD-ROM daily. In fact the respondents did not utilise electronic resources as often as they should considering the enormous amount spent on provision of electronic resources. Apart from the Internet and CD-ROM, the rest of the electronic resources listed were occasionally utilised. This probably implies that undergraduates do not fully understand the various uses and importance of electronic resources in teaching, learning and research. It may also be an indication of the fact that some undergraduates may not be aware of the existence of the resources in their university libraries. Furthermore, results on students' use of library e-resources revealed that the university libraries were the location for use of electronic catalogue (OPAC), e-books and e- journals. The Internet, CD-ROM, electronic databases and electronic abstracts were utilised in the ICT centres on campus. This finding is in agreement with Jagboro (2003) who found that 45.2% of her respondents accessed electronic resources from cybercafé. The result of this study further showed that undergraduates rarely used e-resources in their departmental/faculty libraries. It is important to note that departmental and faculty libraries are very relevant for students' use of electronic resources due to the specialised materials which are abundantly available in these libraries. This finding is not encouraging because other libraries or ICT centres may not be able to provide some of the peculiar materials needed by the students. Also the resultant effect of undergraduates' non-use of their

departmental/faculty libraries would be lack of awareness of these specialised materials for their course of study. Therefore, Ansari and Zuberi (2010) suggested that the main library should subscribe to online journals and provide access to departmental libraries. Moreover undergraduates' concentration on the main libraries and ICT centres would also bring about long queues of students to use the computers. Consequently, there would be frequent break down and maintenance of the computers. Therefore, efforts should be made to provide e-resources in the faculty and departmental libraries. Also, there should be an awareness programme to inform the undergraduates on the availability of the resources in their faculty/departmental libraries.

It was further revealed that the Internet and CD-ROM were accessible in the university libraries. This negates the result in the respondents' location for use of the Internet and CD-ROM in which they indicated that they used them in ICT centres. This may imply that though the e-resources were accessible in the university libraries students still preferred to go to ICT centres. This perhaps may be that they found the ICT centres conducive for their work.

4.5.2. To What Extent do Undergraduates Utilise Electronic Resources in Research?

However it was found that although respondents utilised the Internet, they rarely sent e-mail about research or rarely communicated with lecturers for research purposes but they sometimes browsed for research materials. The respondents sometimes used e-resources for information for class assignment, to write projects and to retrieve current literature for studies and research purposes. The use of the resources for assignment and studies may ultimately enrich their research and academic work. The findings on the extent to which undergraduates utilise electronic resources for research probably imply that some undergraduates may not have been guided in the use of electronic resources. Also, the may not have observed others utilise electronic resources. This is not in agreement with Bandura's (1977) theoretical framework on Social Learning Theory, which posits that people learn by observing others perform activities. Furthermore, the findings may indicate that undergraduates do not see the electronic resources as useful or easy to utilise for research. This is related to Davis (1989) Technology Acceptance

Theory which presupposes that perceived usefulness or perceived ease of use affect use of technology. Therefore, if undergraduates perceive electronic resources as easy it would probably influence the extent to which they utilise electronic resources for research.

4.5.3. What is the Level of Undergraduates' Electronic Information Retrieval Skills in terms of Informational, Operational and Strategic Retrieval Skills?

i. Informational Retrieval Skills

The result pertaining to students' knowledge of information retrieval skills found that respondents' informational retrieval skills were slightly above average. This is worrisome because if informational retrieval skill is relegated to the second position, it may indicate that undergraduates access e-resources without actually knowing what they are searching for. If undergraduates are unsure of their search, they may end up with excess irrelevant materials. It may also lead to insufficient information for their work. The resultant effect of this would probably be poor research output. In addition, undergraduates who lack accurate information may not have a firm understanding of the background of the research topic. This arguement is supported by Moore and St. George (1991), Solomon (1993) and Irving's (1995) study cited in Thomas (2005). The studies posited that students who lacked background knowledge of their topics were not able to pose appropriate research questions and they could not select appropriate search terms.

ii. Operational Retrieval Skills

Respondents' operational retrieval skills were found to be slightly above average. Though operational retrieval skills had the first position in this result it was still poor. This is because a high level of this skill is required to effectively retrieve information in electronic resources. Saunders (2008) affirmed that information cannot be retrieved if one cannot operate the system. Similarly Gui (2007) opined that students should not just learn to operate the computer but to also understand how the information systems are organised. This probably implies that if undergraduates have just the basic operational retrieval skills such as use of key board and mouse without learning the different software and network applications, they would not be able to retrieve information from electronic resources.

iii. Strategic Retrieval Skills

The result revealed that the respondents' strategic skills were on the average. This result was also not impressive because respondents' strategic skills should be excellent so as to effectively search and retrieve quality scholarly materials for research. Giving credence to this view, Chu and Law (2008) opined that possession of search skills could contribute to a more effective and comprehensive search. However these results, perhaps, suggest that students may not have been guided in learning the skills. With proper guidance, the level of their skills would consequently improve and utilisation of e-resources would also improve. In support of this view, Tenopir (2003) advised that it is important to educate high school and college students on the best resources, search strategies and how to evaluate web resources. In fact, undergraduates should be assisted in their searches by suggesting to them, strategies which they could use when their searches fail to produce the desired results.

Furthermore, majority of the respondents expressed negative opinion on information retrieval. Though this study revealed that 750(30.4%) of the respondents agreed that combining two terms retrieved more information however a higher number of the respondents 825(33.4%) indicated that the use of single term retrieved more information. The results equally showed that the respondents strongly disagreed that the use of asterisk (*) and other techniques listed were important in retrieving or searching for information. Aina (2004) stated that students can use a single term or a combination of terms but advised that combination of terms may be more appropriate. However the respondents indicated that change of search term is important when relevant information is not retrieved. This is also in line with Aina (2004) who opined that search terms can be changed if one does not retrieve relevant information. The negative opinion may therefore be ascribed to the respondents' lack of understanding of the importance of information retrieval skills and their minimal knowledge of the different techniques used for information retrieval. Herring's (2010) study on school students, information retrieval and transfer also indicated that students who did not value information retrieval skills failed to understand what benefits might be gained from using the skills.

Findings showed that the respondents' use of search engines for information retrieval is limited to Google, Yahoo and Ask. This is probably due to their inability to use the other search engines. However, it would be inferred that some of the respondents may not be aware of the different varieties of search engines. The respondents limiting their search engines to Google, Yahoo and Ask while neglecting other search engines may result to non-retrieval of pertinent information in the e-resources. This result may also be because respondents were not exposed to a wide variety of search engines and as such may not know which search engines retrieved the best results. For instance, the result indicated that 803(32.5%) respondents never used Google Scholar while 1,467 representing 59.4% of the respondents never used metacrawler. This is in agreement with Singson and Leeladharan's (2010) study on use of scholarly resources among research scholars in Pondicherry University where 87.3% of respondents acquired information from the Internet through Google instead of other gateways. However, Moahi (2002) indicated that there are metasearch agents which provide quick and easy way to assess which search engines retrieve the best result in a search. If respondents have been exposed to this information, their search may not have been limited to Google, Yahoo and Ask. JISC (2010) stated that "because of the ease of use of Google and Google scholar and their high hit rate, many users developed a naïve belief that Google is a reliable source and has high quality articles."

The results further indicated that the respondents were very satisfied with Google (51.4%), Yahoo (39.1%) and Ask (28.6%) more than the other search engines. This is contrary to the views of some of the librarians in the electronic libraries interviewed, who claimed that students were satisfied after the use of e-resources while others said they seemed satisfied. However, this result is not surprising since the respondents indicated that they mainly used Google, Yahoo and Ask. This is because one cannot be satisfied with what one is not aware of or be conversant with what you do not use. For instance, the respondents did not use Metacrawlers like Copernic which is good for research work. Awe (2004) explained that Copernic is outstanding when it comes to research work since it can query many search engines, directories, usenet records and e-mail databases in a single search.

Findings on training of undergraduates on information retrieval revealed that 65.3% of the respondents received training on information retrieval from the university library. However, it was found that 68.4% of the respondents acquired their information retrieval skills mainly through assistance from other students. 62.2% were self taught, 60.8% received training through external courses while 59.8% were through trial and error. This confirmed Ray and Day's (1998) study which indicated that 78.7% of students acquired skills to use electronic resources through trial and error, 78.7% through guidance from other students while 54.2% received guidance from library staff. The result further confirmed Millawithanachchi and Jayasundara (2010) who indicated that majority of the users of the Internet were self learners who read manuals and help options. This result is discouraging because the students teaching the skills to others may not have an in-depth knowledge of what they are teaching. Also respondents who are in the category of self taught may not understand some applications and why they are so.

Acquiring the skills through external courses may also be unfavorable owing to the fact that some of the course organisers may be more interested in the monetary gain than in teaching the needed skills. Since undergraduates are trained on information retrieval in the university libraries, it is rather surprising that they acquire their skills through other sources. The implication of this is that students were probably just given basic training without treating the areas that pertain to their required needs for research. Moreover respondents' acquisition of skills through these avenues may be because the departmental/faculty do not teach these skills. It was also revealed that training offered by faculty/department was last, with 26.2%. This is contrary to Ray and Day (1998) who opined that tutors should encourage their students to use e-resources. The study posited that if information skills training occurs outside of the curriculum, students will be less likely to make use of electronic resources for academic purposes. The result is also not in line with Tenopir (2003) who revealed that the most effective way for students to learn about important resources in academic libraries is for librarians to work directly with faculty to bring relevant electronic resources into the classroom. It is therefore vital for information retrieval to be included in the curriculum as this would enhance undergraduates' use of electronic resources. Chu and Law (2008) equally suggested that students should be trained on information sources, databases and information search

skills. They further advised that the training should be tailored to the specific needs of the students. In fact some of the results are contrary to the framework of this study, in that Bandura (1977) is of the opinion that people should learn from one another through observation, imitation and modeling, instead some of the respondents acquired the skills by self taught and trial and error.

4.5.4. What is Undergraduates' Level of Perception of the Ease of Use of Electronic Resources?

The findings of this study revealed that 1,027 representing 41.6% of the respondents were of the opinion that electronic resources were very easy to use, convenient for students to access (39.0%) and useful for retrieving information for project work (35.2%). This is supported by Oduwole and Akpati's (2003) study on accessibility and retrieval of electronic information resources which indicated that the university community found the electronic information resources easy to use and were satisfied with their search outputs. Though the respondents indicated that they perceived e-resources as easy, however the findings revealed that they occasionally used e-resources. Also the result on use of e-resources across courses of study indicated low mean scores. This perhaps implies that they did not really perceive it as easy because if they had perceived e-resources as easy they would have been using all the e-resources frequently. Furthermore 1,095(44.3%) of the respondents strongly disagreed that e-resources were not useful for their research work. This implies that e-resources were useful for their work. This is in agreement with the study of Okello-Obura and Magara (2008) on information access and utilisation by Makerere university students in Uganda. Their study indicated that 90% of the respondents agreed that the standard of their academic work would suffer without electronic resources. However, 34.9% of the respondents agreed that information in electronic resources sometimes were not readily available. The interview with the electronic librarians revealed that this situation may be because of constant breakdown of computers due to epileptic power supply. Results also revealed that the Internet was very popular amongst the respondents. 53.1% of them perceived the Internet as very easy to utilise for information for research. The Internet also helped 52.0% of the respondents to access information for class assignments. This is

contrary to Kari (2004) on usage of the Internet, OPAC, CD-ROMs and Online databases by undergraduates of Perpustakaan tun Abdul Razak1 in Malaysia which indicated that respondents used online databases more frequently for completing assignments. The Internet was mainly used to gain general knowledge. Through the findings, it was discovered that electronic books were easy for respondents to use and they provided access to new editions of books for studies. This is not in agreement with Sharma's (2009) study which indicated minimal use of e-books by the respondents. Furthermore, findings showed that e-journals were easy to use for research. According to the respondents, e-journals were used to access current literature for their research work. This supported the study carried out by Egberongbe (2011) which found that 80.0% of research scholars preferred to use e-journals for their research work. However the respondents opined that access to electronic journals were always restricted. This is also in agreement with Singson and Leeladharan (2010) which indicated that restriction of sites and use of various terms and phrases limit users from accessing e-journals. Also the respondents indicated that electronic catalogue (OPAC) was used for building up bibliography. It was revealed that 32.2% of the respondents indicated that electronic resources were easy to utilise because of their course of study. However, 31.0% of the respondents were not satisfied with the databases available in their libraries. According to some of the electronic librarians interviewed, the e-resources were provided in the libraries but some of the undergraduates preferred to just use the Internet while some of them rarely requested to be guided in using the e-resources.

4.5.5 Relationship Between Retrieval Skills and Undergraduates' Utilisation of Electronic Resources in University Libraries

The result of this hypothesis revealed that informational retrieval, operational retrieval and strategic retrieval skills had positive, weak and significant relationship with use of electronic resources. This means that though the three retrieval skills had weak relationship with use of electronic resources, they were still helpful for utilisation of the resources.

The weak significance is not encouraging. The implication of this finding may be that undergraduates lack the knowledge of information retrieval skills and their relevance

in research. Undergraduates may require high level of three retrieval skills for maximum utilisation of electronic resources. This result is in agreement with Kari's (2004) study on use of electronic resources by undergraduate students at Perpustakaan Tun Abdul Razak 1 UITM Shah Alam. The study posits that students require adequate knowledge of information skills. With the speedy introduction of new electronic resources, undergraduates require adequate knowledge of informational retrieval, operational retrieval and strategic retrieval skills to cope with the ever changing contents of electronic resources.

4.5.6 Relationship Between Perceived Ease of Use and Undergraduates' Utilisation of Electronic Resources in University Libraries

In the study, it was found that perceived ease of use of electronic resources by the respondents had a slightly weak, positive and significant relationship with the utilisation of the resources. This indicates that if undergraduates perceive the use of electronic resources as easy, it may likely improve the level of utilisation of electronic resources for their research. This finding is contrary to Yusoff (2009) finding of an insignificant relationship between perceived ease of use and actual usage. Also Ramayah and Aafaqi (2004) cited in Yusoff (2009) found insignificant relationship between perceived ease of use and actual usage. This is contrary to Davis' (1989) theory, one of the frameworks of the study, which stated that perceived ease of use has a significant influence on usage of and intention to use technology. Anandarajan, Igbaria and Anakwe (2002) opined that perceived ease of use is a necessity in technology use. They stated that fewer complications and complexities will bring about favorable perception of the resources being used. The respondents also perceived electronic resources as easy to use. This is in agreement with the result of the interviews where the electronic librarians claimed that the students perceived electronic resources as easy to use. However this negates the result on frequency of undergraduates' use of electronic resources which revealed that respondents occasionally used most of the e-resources. This perhaps implies that undergraduates perceived electronic resources as easy to use but have not fully accepted their use probably because they do not understand the benefits of the use of the resources for academic purposes. Furthermore the finding of the study on this relationship may be

true in Nigeria where undergraduates are not as exposed to electronic resources as their counterparts in developed countries where electronic resources are even used from elementary schools.

4.5.7 Composite Effect of the three Retrieval Skills on Undergraduates' Utilisation of Electronic Resources in University Libraries.

The results show that there is a positive multiple relationship among the three retrieval skills on undergraduates' utilisation of electronic resources. This indicates that informational retrieval, operational retrieval and strategic retrieval skills would jointly determine undergraduates' utilisation of electronic resources. The implication of this is that for undergraduates to adequately utilise electronic resources for research, they require the knowledge of the three retrieval skills. For instance, knowledge of just informational retrieval or operational and strategic retrieval together without informational retrieval skill may probably not be of help on undergraduates' utilisation of electronic resources.

Also, the regression of the skills indicated that 12.6% of the total variance in the respondents' use of electronic resources is accounted for by informational retrieval, operational retrieval and strategic retrieval. This means that the three jointly determine undergraduates' utilisation of electronic resources.

4.5.8 Relative Effect of the three Retrieval Skills on Undergraduates' Utilisation of Electronic Resources in University Libraries.

Findings also revealed that strategic retrieval skills made the highest contribution to students' use of electronic resources. This is followed by informational retrieval skill. Operational retrieval skill which is not significant is the last, meaning that a high level of strategic retrieval skill may be more helpful to students to be able to utilise the electronic resources in the university libraries more than informational retrieval and operational retrieval skills.

This corroborated the findings of Thomas (2004) who stated that sophisticated computer skills do not translate into skills in search and retrieval of information. That means an undergraduate with operational skill will still require strategic and informational skill to be able to utilise the e-resources. Furthermore, the study found that

there was a positive multiple relationships among the three retrieval skills and undergraduates' use of electronic resources. Also, the F-ratio for the regression is significant, meaning that informational retrieval, operational retrieval and strategic would jointly enhance undergraduates' effective utilisation of electronic resources.

4.5.9 Composite Effect of Retrieval Skills and Perceived Ease of Use on Undergraduates' Utilisation of Electronic Resources in University Libraries

The regression of retrieval skills and ease of use on utilisation of electronic resources revealed that the three retrieval skills; informational retrieval, operational retrieval and strategic retrieval skills and ease of use correlate positively with use of electronic resources. The regression on retrieval skills and ease of use indicated that the R-value of 0.434 is significant, confirming that the retrieval skills and ease of use jointly may determine the utilisation of electronic resources. It implies that if undergraduates have the three retrieval skills and perceive the use of electronic resources as easy it would probably improve their utilisation of library electronic resources. However, Torma and Vakkari (2004) declared that though several studies have been carried out on electronic resources and libraries but they did not show how various factors co-vary with each other and with the use of electronic resources.

4.5.10 Relative Effect of Retrieval Skills and Perceived Ease of Use on Undergraduates' Utilisation of Electronic Resources in University Libraries

The result of the study showed that ease of use made the greatest contribution to undergraduates' use of electronic resources. Strategic retrieval skills was second in rank in contributing to undergraduates' use of electronic resources skills while informational retrieval and operational retrieval skills were third and fourth in rank respectively in contributing to undergraduates' use of e- resources. Operational retrieval skills made contribution which is not significant however perceived ease of use, strategic retrieval and informational retrieval skills made significant contributions to undergraduates' use of e-resources. This indicates that the way undergraduates perceived ease of use of electronic resources determine to a great extent if they would utilise the resources for

research. However, if undergraduates have strategic retrieval skill, it may determine their use of electronic resources but not as much as their perception of ease of use would do. Also if undergraduates have informational retrieval skills, they may utilise electronic resources but they would be more motivated to use the resources depending on their perception of ease of use and whether they have strategic skills to retrieve relevant information. Furthermore it was found that operational retrieval skills may determine undergraduates' use of electronic resources but it is not as important as the other three factors. This is not in agreement to Oliver (1997) who stated that to effectively retrieve information; users should have appropriate instructions and frequent activity with electronic information system. Also Terkla and Mckinzie (1997) were of the view that understanding formats and search strategies demands familiarity with each system's peculiarities and understanding of its deep structures However for optimal utilisation of library electronic resources for research, efforts therefore should be made to assist undergraduates in acquiring the three retrieval skills and also in positively changing their perception of the utilisation of electronic resources since these variables would determine their utilisation of electronic resources for research.

4.5.11 Relationship Between the Demographic Variables (Age, Gender and Course of Study) and Undergraduates' Utilisation of Electronic Resources in University Libraries

The result on socio-demographic factors found that the majority of the respondents were between 21-24 years old representing 51.6%. Though this age bracket represents majority of the respondents, however the result revealed that age has no significant relationship with students' use of electronic resources. This confirms Waldman's (2003) view that age has no relationship with use of library's electronic resources. It may therefore mean that the age 21-24 represents the active years where students are more likely to be undergraduates and equally be able to use e-resources for their research work. This is not in agreement with Borrego, Anglada, Barrios and Comellas (2007) who found age as explanatory factor of the use of e-journals.

Findings further revealed that gender has no significant relationship with use of electronic resources. This corroborated Waldman (2003) who found that gender did not

have any effect on students' use of the library's electronic resources. This may indicate that female students were able to use e-resources just like the males.

Concerning students' course of study, results revealed that course of study has a significant but weak relationship with use of electronic resources. That means that it has a significance with the use of electronic resources but the level of significance is not very high (.010). This may therefore imply that course of study of students may influence their actual utilisation of electronic resources. This may also be due to the fact that some courses of study are more exposed to use of information and communication technologies. According to Wilberly and Jones (1994) cited in Agbonlahor (2005)a study of IT adoption behaviour of eleven humanist scholars over a period of five years, found that scholars in the humanities adopted new technologies slowly than scientists and social scientists. Furthermore, this study is in agreement with the study conducted by Borgman (2000) and Tenopir (2003) cited in Vakkari and Torma (2004) which stated that representatives in science and medicine were more frequent users of electronic resources than those in humanities and social sciences. The result in this study revealed that students used all the electronic resources. However, it was found that respondents in the sciences used more of the electronic databases, electronic catalogue and the CD-ROMs more than the respondents in humanities and social sciences. It was also found that respondents in humanities used the Internet, e-journals and e-abstracts more than the other e-resources. This finding may imply that there is improvement in the way humanities adopt new technologies. They probably use e-resources now as much as the students in sciences and social sciences. Similarly, the respondents in social sciences used all the e-resources as much as the humanities and sciences but it was discovered that they used e-books more than the other e-resources. Findings on course of study may also indicate that the respondents were becoming aware of the importance of the utilisation of e-resources for educational outcomes. However, the result in this study is in agreement with Borrego, Anglada, Barrios and Comellas (2007) findings on course of study which they indicated as important factor for the use of e-journals.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the summary of findings of the study, implications of the research, conclusion, recommendations, contribution to knowledge, limitation of the study and suggestions for further research**.**

5.1 Summary of Major Findings

Findings of this study are summarised as follows:

1. Apart from the Internet which was most frequently utilised, undergraduates occasionally utilised the other electronic resources listed. Furthermore, electronic catalogue (OPAC), e-books and e-journals were utilised in the university libraries while the Internet, CD-ROM, e-databases and e-abstracts were utilised in ICT centres on campus. Moreover, the Internet was found to be accessible in university libraries.
2. Undergraduates' extent of utilisation of electronic resources in research is not very high. Though some undergraduates sometimes utilised electronic resources for browsing for research materials, class assignment and for writing projects, however some of them rarely utilised the resources for research activities.
3. Undergraduates' informational and operational retrieval skills were slightly above average while strategic skills were on the average. Undergraduates had negative opinion of information retrieval but agreed that retrieval strategies would aid in retrieving more information. Furthermore, search engines for undergraduates' retrieval of information were limited to Yahoo, Google and Ask. Also, the undergraduates received training on skills for information retrieval from the university main library but they did not receive any training from their faculties and departments. Undergraduates also acquired skills for information retrieval mainly through assistance from other students. Some of them acquired their skills through self taught, external courses and trial and error.

4. Undergraduates perceived the e-resources as fairly easy to use but their opinion on ease of use, benefits derived and general views on electronic resources are poor.
5. There is significant relationship between retrieval skills and undergraduates' utilisation of electronic resources in university libraries.
6. Undergraduates' perceptions of ease of use of e-resources correlate with their utilisation of e-resources in university libraries.
7. There is significant composite effect of informational retrieval, operational retrieval and strategic retrieval skills on undergraduates' utilisation of electronic resources in university libraries.
8. Strategic retrieval and informational retrieval skills have significant relative effect on undergraduates' utilisation of electronic resources in university libraries. However, operational retrieval skills did not have significant relationship with undergraduates' utilisation of electronic resources.
9. Also, information retrieval skills and perceived ease of use had significant composite effect on undergraduates' utilisation of electronic resources in university libraries.
10. Informational retrieval, strategic retrieval and perceived ease of use had significant relative effect on undergraduates' utilisation of electronic resources in university libraries while operational retrieval had insignificant relative effect.
11. Demographic variables of age and gender had no relationship with students' use of electronic resources but students' course of study is related to undergraduates' utilisation of electronic resources in university libraries.

5.2 Implications of the Research

The result of this research has raised some implications for planning undergraduates' courses, university libraries and faculty/departmental libraries. The study raised a vital point that universities provided several electronic resources in their libraries but the e-resources were occasionally used. This implies that the e-resources were underutilised since the average student goes to the library mainly to use the Internet. It has become clear from this study that undergraduates are interested in utilisation of e-resources for research. However their retrieval skills were not very high which implies that they were not properly taught to use e-resources for optimal retrieval

of information for research. Therefore, university librarians should have a policy on creation of undergraduates' awareness on all the electronic resources in the library. For instance, they may give monthly talks/seminars for different faculties, on the existence and use of electronic resources in the university libraries. Also, university management should have a policy that ensures the introduction of compulsory courses on electronic resources in their academic curriculum. This will enhance undergraduates' knowledge of electronic resources. The acquired knowledge of use of electronic resources will ultimately curb undergraduates' underutilisation of electronic resources in university libraries.

Another implication of this study is that undergraduates who were expected to present theses to their departments before completion of their studies did not use the faculty/departmental libraries as their access point for use of e-resources. This implies that there may be absence of e-resources peculiar to students' course of study in their libraries and if the undergraduates resort only to the main library it could result to overcrowding of the university main libraries. University management should recognize that there are different disciplines in the university. Therefore they should form the practice of donating some of the electronic resources peculiar to students' courses of study to faculty/departmental libraries to avoid overcrowding of the university libraries.

5.3 Conclusion

It is evident from the study that information retrieval skills and perceived ease of use of e-resources are vital for utilisation of e-resources for research by undergraduates in universities. Also electronic resources are provided in the university libraries for accurate and fast retrieval of information but it is also noteworthy that due to lack of skills, undergraduates in the universities did not fully utilise the electronic resources to retrieve information for research. They also did not really perceive e-resources as easy to use which resulted to occasional use of the e-resources. It was also discovered that student's course of study enhanced the use of e-resources for research. Therefore, for optimal utilisation of electronic resources in university libraries, it is necessary for university management, curriculum planners and university librarians to settle some of these issues as this will equip undergraduates with lifelong skills needed in the society.

5.4 Recommendations

Based on the findings of this study, the following recommendations were suggested:

1. University libraries should organise constant awareness programme such as, orientation, talks/seminars and workshops in the university libraries which should be tailored to informing undergraduates of the utilisation of not just the Internet but all the e-resources available for research. Library staff should also give out fliers and equally put posters and bill boards at strategic places to inform undergraduates about the different types of electronic resources in the libraries.
2. University lecturers should encourage undergraduates' to have a high level of utilisation of electronic resources by frequently giving the students assignments that require utilisation of the currently available electronic resources in their libraries. The resultant effect of this is an improvement in the extent to which students use e-resources for research.
3. University library staff should be more involved in training undergraduates to acquire the skills for information retrieval from e-resources by assisting them during the search process. Also emphasis should be on different search engines that can enhance quick retrieval of information.
4. University management should endeavour to introduce courses on utilisation of electronic resources in the academic curriculum so that the undergraduates would be conversant with them and equally have positive perception of the utilisation of the resources.
5. Academic staff should encourage undergraduates to perceive the e-resources as easy by teaching them retrieval search strategies that can adequately retrieve information for teaching, learning and research.
6. The faculty/departmental librarians should persistently look for avenues of improving their libraries, such as, seeking for donations of electronic resources peculiar to different courses of study from organisations and university management.

7. University librarians should organise in-house training and short term courses, for library staff, on the use of electronic resources so as to efficiently assist undergraduates in access and retrieval of information for research.

5.5 Contribution to Knowledge

Contributions which the study makes to knowledge are:

The study revealed the critical factors influencing undergraduates' utilisation of electronic resources. Similarly, it added the knowledge that if undergraduates are taught how to use electronic resources for retrieval of information for research, they will make more use of the e- resources in university libraries, thus justifying the enormous amount of money spent on acquiring the resources.

Specifically, the study revealed that information retrieval skills, perceived ease of use and demographic variables determine undergraduates' capacity to utilise electronic resources. In addition, the study has created the awareness that capacity building is needed for maximum utilisation of electronic resources.

The work has contributed the knowledge that course of study influences utilisation of electronic resources by undergraduates. Another contribution to knowledge is that undergraduates in Nigeria utilise electronic resources for research irrespective of age and gender.

In addition, there is also empirical evidence that age and gender do not determine undergraduates' use of electronic resources for research.

5.6 Limitation of the Study

The study was limited by the dearth of local information in the study area in Nigeria. There was also limitation of the study to only federal universities. The study was also limited to selected faculties and departments.

5.7 Suggestions for Further Research

The following have been suggested for further studies

1. The study could be enlarged to cover other areas in information retrieval skills not covered by this study.
2. A replication of the study in state and private universities will be necessary to generalise findings.
3. There is need in conduction of the study in other faculties and departments.

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APPENDIX I

INFORMATION RETRIEVAL SKILLS, UTILISATION OF ELECTRONIC RESOURCES SCALE

Dear Respondent,

This is a Ph.D research questionnaire on information retrieval skills and use of library electronic resources. You are please requested to complete this questionnaire. Your contribution to this study will be greatly appreciated.

Thank you.

Yours faithfully,

M.C. EKENNA

SECTION A: BACKGROUND INFORMATION

1. Name of Institution ……
2. Course of Study:……
3. Department:……
4. Faculty:……
5. Sex: Male ( ) Female ( )
6. Age: 16 -20 ( ) 21 – 24 ( ) 25 – 29 ( ) 30 and above ( )

SECTION B: UTILISATION OF LIBRARY ELECTRONIC RESOURCES

7. In which of these locations do you use the following electronic resources?

E-Resources	University library	Faculty Library	Department library	ICT Centre on campus
Electronic catalogue (OPAC)				
The Internet				
CD- ROM				
Electronic books				
Electronic journal				
Electronic databases				
Electronic abstracts				

8. How accessible are these electronic resources in your library?

E-Resources	Easily Accessible	Accessible	Not Accessible	Never Accessible
Electronic catalogue (OPAC)				
The Internet				
CD- ROM				
Electronic books				
Electronic journal				
Electronic databases				
Electronic abstracts				

9. To what extent do you utilise electronic resources in research?

Tick as many as are applicable to you.

E-Resources	Always	Sometimes	Rarely	Never
a. E-mail to friends about research				
b. Browsing for research materials				
c. Class assignments				
d. Writing projects				
e. Chat with friends about research				
f.Communication with lecturers for research purposes				
g. Retrieve current literature for studies				

10. How frequently do you utilise these electronic resources?

E-Resources	Daily	Twice a week	Once a week	Twice a month	Once a month	Occasionally	Never used
CD – ROM							
The Internet							
Electronic catalogues (OPAC)							
Electronic journals							
Electronic books							
Electronic databases							
Electronic abstracts							

SECTION C: PERCEIVED EASE OF USE OF ELECTRONIC RESOURCES

11. Which of the following best describes your opinions of E-Resources?
SA- Strongly Agree, A – Agree, D – Disagree, SD – Strongly Disagree,

Statement	SA	A	D	SD
a. Electronic resources are very easy to use.				
b. Electronic resources are complex and difficult to use.				
c. Electronic resources is very difficult to access.				
d. E-resources are convenient for students to access.				
e The Internet is very easy to utilise for access to information for research.				
f. The Internet has helped me in access to information for class assignments.				
g. CD-ROMs are very easy to use.				
h. CD – ROM has helped me in retrieving full-text articles for research work.				
i CD – ROM databases in my library are not relevant to my course of study.				
j. E-books are easy to utilise.				
k Electronic books have provided access to new editions of books for my studies.				
l. Electronic journals are easy to utilise for research.				
m. Electronic journals have helped in retrieving current literature for my research work				
n. Access to electronic journals are always restricted.				
o. Electronic catalogues (OPAC) has helped in building up my bibliography.				
p. Electronic resources help in retrieving information for my project.				
q E- resources are not useful for my research work				
r. Information in e-resources is sometimes not readily available.				
s. E-resources are easy for me to utilise because of my course of study.				
t. E-resources are easy for me to utilise because of my faculty.				
u. My department has no influence on my competence in electronic resources utilisation.				
v. I am not satisfied with the databases available in my library.				
s. I am satisfied with the databases available in my library.				

SECTION D: RETRIEVAL SKILLS FOR ELECTRONIC RESOURCES USE

12. How often do you utilise the following search engines for information search?

Search Engines	**Very often**	**Often**	**Rarely**	**Never**
a. Google				
b. Google scholar				
c. Yahoo				
d. Infomine				
e. Lycos				
f. Infoseek				
g. Alta vista				
h. Hot bot				
i. Metacrawler				
j. Ask				
k. Others				

13.To what extent are you satisfied with the use of these search engines for information retrieval?

Search Engines	**Very satisfied**	**Satisfied**	**Not Satisfied**	**Not Satisfied at all**
a. Google				
b. Google scholar				
c. Yahoo				
d. Infomine				
e. Lycos				
f. Infoseek				
g. Alta vista				
h. Hot bot				
i. Metacrawler				
j. Ask				
k. Others				

14. Which of the following best describes your opinion?
SA – Strongly Agreed, A – Agreed, D –Disagree, SD - Strongly Disagree,

Statement	SA	A	D	SD
a. The use of a single term retrieves more information.				
b. Combining two terms retrieves more information.				
c. Use of dollar sign ($) is very important in retrieving information.				
d. The use of asterisk(*) is very important in retrieving information.				
e. Proximity features (ADJ & SEN) are used often to retrieve information.				
f. Title search is very useful for electronic catalogue (OPAC) search.				
g. Author search is used more frequently for electronic catalogue (OPAC) search.				
h. Shelf search is often used for electronic catalogues (OPAC) search.				
i. Change of search terms is important when you do not retrieve relevant information.				
j. Advanced search strategy is used to retrieve relevant information.				

15. Please rate your knowledge of the following skills (1) Very poor (2) Poor (3) Average (4) Good (5) Very Good.

S/No	Skills	Very good	Good	Average	Poor	Very poor
a	**Informational skills** Definition of your needs for research.					
b	Locating information in e-resources.					
c	Selecting articles with ease.					
d	Summarising materials in your own words.					
e	Understanding terminologies used in databases.					
f	Utilisation of reference sources to increase familiarity of topics.					
g	**Operational Skills** Use of mouse and keyboard.					
h	Copying information into your storage device such as flash drive and diskette					
i	Retrieving information from flash drive or diskette.					
j	Scanning images.					
k	Access of on-line databases.					
l	Download files from on-line databases.					
m	Combining two terms to retrieve information.					

n	Use of truncation search techniques ($, *, +) to retrieve information					
o	Use of title search for electronic catalogue (OPAC) search.					
p	Use of author search for electronic catalogue (OPAC) search.					
q	Shelf search for electronic catalogue (OPAC) search.					
r	Use of search engines such as Yahoo, Google, Alta Visa and Google scholar etc.					

SECTION E : ELECTRONIC RESOURCES SKILLS ACQUISITION

16. Were you given any training on how to retrieve information from electronic resources in your library?

Yes ☐ No ☐

17. Is there any course in your faculty/department on how to retrieve information from electronic resources?

Yes ☐ No ☐

18. How did you acquire the skills on how to retrieve information from electronics resources?

Skills Acquisition	**Strongly Agree**	**Agree**	**Disagree**	**Strongly Disagree**
a. Trails and error				
b. Assistance from other students				
c. Guidance from staff				
d. Self taught				
e. Training offered by faculty/department				
f. Training through external courses				

APPENDIX II

INTERVIEW CHECKLIST FOR LIBRARIANS IN THE ELECTRONIC LIBRARY UNIT

1. For how long have you been a librarian in the section?
2. Do you have electronic resources in your library?
3. If yes, which ones do you have?
4. If no, what efforts have you made to provide electronic resources in your library?
5. Which e-resources do students often use?
6. Are the e-resources readily available for students' use?
7. If no, what are the reasons for this?
8. Are undergraduates given any orientation or training in the library on the use of electronic resources?
9. Are your staff allowed to assist the students in retrieving information from electronic resources?
10. How do undergraduates perceive the ease of use of electronic resources?
11. Do you know the reason for their perception?
12. Can you gauge user satisfaction?
13. If yes, do students seem satisfied after the use of electronic resources?
14. What challenges have you encountered on students retrieval of information and their use of e-resources?
15. How have you attempted to solve them?

APPENDIX III

LIST OF FEDERAL UNIVERSITIES IN NIGERIA (2007/2008)

1. Abubakar Tafawa Balewa university of Technology , Bauchi
2. Ahmadu Bello University, Zaira
3. Bayero University, Kano
4. Federal University of Petroleum Resources, Effurun
5. Federal University of Technology, Akure
6. Federal University of Technology, Minna
7. Federal University of Technology , Owerri
8. Federal University of Technology, Yola
9. Michael Okpara University of Agriculture, Umudike
10. National Open University of Nigeria
11. Nigeria Defence Academy, Kaduna (NDA)
12. Nnamdi Azikiwe University Akwa
13. Obafemi Awolowo University, Ile-Ife
14. University of Abuja, Gwagwalada
15. University of Agriculture, Abeokuta
16. University of Agriculture, Markurdi
17. University of Benin, Benin-City
18. University of Calabar, Calabar
19. University of Ibadan, Ibadan
20. University of Ilorin, Ilorin
21. University of Jos, Jos
22. University of Lagos, Akoka, Yaba, Lagos
23. University of Maiduguri, Maiduguri
24. University of Nigeria, Nsukka
25. University of Port-Harcourt, Port-Harcourt
26. University of Uyo, Uyo
27. Usuman Danfodiyo University, Sokoto