AN EXAMINATION OF THE USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY THE ACADEMIC STAFF OF AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

BY

ABDULLAHI SULEIMAN ABUBAKAR

DEPARTMENT OF MASS COMMUNICATION,

FACULTY OF SOCIAL SCIENCES

AHMADU BELLO UNIVERSITY,

ZARIA, NIGERIA

MAY, 2017

AN EXAMINATION OF THE USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY THE ACADEMIC STAFF OF AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA

BY

ABDULLAHI SULEIMAN Abubakar, B.A. MASS COMM (UNIMAID) 2010

(P13SSMM8053)

DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES, AHMADU BELLO UNIVERSITY, ZARIA,

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD

OF

MASTER OF SCIENCE DEGREE IN MASS COMMUNICATION

DEPARTMENT OF MASS COMMUNICATION,

FACULTY OF SOCIAL SCIENCES,

AHMADU BELLO UNIVERSITY,

ZARIA, NIGERIA

MAY, 2017

Declaration

I declare that this dissertation entitled "An Examination of the Usage of Information and Communication Technology by the Academic Staff of Ahmadu Bello University, Zaria, Nigeria" has been carried out by me in the Department of Mass Communication. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other Institution.

…………………………………………….	………………….	…......…………
Student	Signature	Date

Certification

The dissertation entitled "**AN EXAMINATION OF THE USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGY BY THE ACADEMIC STAFF OF AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA**" by Abubakar ABDULLAHI SULEIMANmeets the regulations governing the award of the degree of Master of Science in Mass Communication of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

YakubuOzohu-Suleiman, Ph.D. ………………… …………………..

Chairman, Supervisory Committee Signature Date

Shamsuddeen Mohammad, Ph.D. ………………… …………………..

Member, Supervisory Committee Signature Date

Mahmud M. Umar, Ph.D. ………………… ………………….. Head, Mass

Communication DepartmentSignature Date

Prof. Sadiq Z. Abubakar ………………… …………………..

Dean, School of Postgraduate Studies Signature Date

Ahmadu Bello University, Zaria.

Dedication

This dissertation is dedicated to Almighty Allaah for His uncountable blessings and mercies on me.

Acknowledgements

All praise belongs to Almighty Allaah. I thank Him for giving me guidance, wisdom, knowledge and strength that made this work a reality. May the peace and blessing of Allaah be on our noble Prophet Muhammad (S.A.W) who is sent as mercy to humanity, ameen. I sincerely appreciate the untiring efforts of my supervisors YakubuOzohu-Suleiman and Shamsuddeen Mohammadfor their guidance and patience in seeing to the success of this work. I am very much grateful for all the knowledge you imparted in me. I am also very grateful to all the academic staff of Ahmadu Bello University who out of their tight schedules created time to attend to my questionnaire. To my family members I say a BIG thank you for all you have done to me, may Allah reward you all with JannatulFirdaus. I also appreciate the support and concerns of friends and colleagues at NAERLs. I would also like to thank the academic and non-academic staff of the Department of Mass communication, Faculty of Social Sciences Ahmadu Bello University, Zaria for their contribution in giving this research a face lift and friends and colleagues in the department especially the P13 set I say thank you all. I am also grateful to friends and brothers at Sassakawa/Yar'adua hostel for support and prayers. Toothers, too numerous to mention, who have participated directly with me on the field, or offer words of advice, support and understanding throughout the course of this program I say thank you all.

Abstract

The study examined usage of basic computer applicationsand awareness, access and utilizationof academic e-resources, as well as the challenges encountered in the process, by the academic staff of Ahmadu Bello University Zaria. The study was anchored on the Unified Theory of Acceptance and Use of Technology (UTAUT). A survey method of communication research was employed with questionnaire as the instrument of data collection. A sample of 330 lecturers was drawn from the twelve faculties of the University using stratified probability sampling technique. The results showed that majority of the respondents across all the faculties use basically five computer applications; Microsoft word, Excel, PowerPoint, Adobe Reader and SPSS. Also, there is high awareness with variation in access and utilization of various academic e-resources according to disciplines. However, academic e-resources that offer multidisciplinary resources and as well open access like Google Scholar, Research Gate, African journal online,Science Direct andDirectory of Open Access Journalsare mostly accessed and used by lecturers from the Faculties of Human Medicine, Veterinary medicine, Science, Agriculture and Pharmaceutical Sciences than their counterparts in the Faculties of Law, Education, Social Sciences, Arts, Environmental Design, Engineering and Administration. Lecturers who have low access and utilization levels of various computer applications and academic e-resources are largely challenged by low ICT skills, excess workload, technophobia and lack of reliable institutional internet facility and subscription to academic e-resources in the faculties. The study recommends improved ICT training for academic staff, complete Wi-Fi and LAN networking of the faculties and committed subscription to academic e-resources by the University. This should be backed up by a policy that emphasizes the use of e-platforms for research delivery, teaching and seminars by the academic staff.

Table of content

List of Tables

List of Figures

Abbreviations

ABU	Ahmadu Bello University
AGORA	Access to Global Online Research on Agricultural Programs
AJOL	African Journals Online
ARDI	Access to Research for Development and Innovation
AVU	African Virtual University
C-TAM-TPB	Combined TAM and TPB
DBI	Digital Bridge Institute
DOAJ	Directory of Open Access Journals
DOI	Diffusion of Innovation Theorem
DVD	Digital Versatile Disc
E-resources	Electronic Resources
EE	Effort Expectancy
FC	Facilitating Conditions
GSM	Global System for Mobile Communication
ICT	Information and Communication Technology
IS	Information System
ISP	Internet Service Providers
IT	Information Technology
JSTOR	Journal Store
MM	Motivational Model
MPCU	Model of PC Utilization
NCC	Nigerian Communications Commission
ND	No Date
NUC	National Universities Commission
PE	Performance Expectancy

PDA	Personal Digital Assistants
SAS	Statistical Analysis Software
SCT	Social Cognitive Theory
SI	Social Influence
SPSS	Statistical Package for Social Sciences
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
TPB	Theory of Planned Behaviour
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UTAUT	Unified Theory of Acceptance and Use of Technology
VCD	Video Compact Disc

CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

The term Information and Communication Technologies (ICTs) refers to the technologies that are used to transmit, process, store, retrieve, create, display, share or exchange information by electronic means. This broad definition of ICTs includes such technologies as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as video-conferencing, e-mail and blogs (UNESCO, 2007).

Howell and Lundall (2000) view ICTs as encompassing all forms of technologies used to create, store, process and use information in its various forms (data, voice, image, multi-media presentations and other forms, including those not yet conceived) and which enable, facilitate and support communication. Most especially ICTs include telephone, mobile phone, private automatic box exchange (PABX), photocopier, scanners, fax machines, close circuit television sets, cameras, personal digital assistants (PDAs), conventional digital camera, microwave link systems and very small aperture terminal (V-Sat), computer, magnetic tape, CD-ROMs, DVDs and the Internet.

According to Iahad, Madar, Oye& Rahim (2012),ICT is an umbrella term that includes any communication device or application encompassing radio, cellular phones, hardware and software, smartboard, computer and network, satellite, etc. These can be used to enhance and support face to face or mediated communication. Information and Communication Technologies (ICTs) are often described as technologies which comprise computers and telecommunication devices that are used for information gathering/acquisition, processing, storage, retrieval and dissemination by users.

The revolution in ICTs is sweeping across the world and even in developing countries like Nigeria. Information and communication technologies have led to the introduction of new methods of teaching and enhancing the conduct of research and learning (Sansanwal, 2009). University administrations in Nigeriaconsider information and communication technologies as necessary facilities in the process of learning and teaching (Nwachukwu&Ason, 2015).ICTs have become a driving force in the academia as they provide a platform where academics can generate, store, retrieve, preserve and transmit information.ICTs encompasses all the technologies that facilitates the processing, transfer and exchange of information and communication services. In principle, ICTs have always been available since the advent of the printing press,the only difference is that from the late twentieth century there has been rapid advancement in communication technology and this has changed the traditional ways by which information was processed; communications conducted, and services made available (Adu, 2002).

Kaplan (2001) is of the view that technological advancements have changed business operations especially in the media business and also the way people communicate. One would even imagine replacing the term "Post-industrial Society" with “Information Society", that is a society where the ability to access, search, use, create and exchange information is the key to individual and collective well-being.

In the academia, the information and communication technologies are seen as advances in technologies that provide rich global resources and collaborative environment for the dissemination of ICT literacy materials and interactive discussions, sharing research information and international exchange of ideas which are critical for advancing meaningful educational initiatives, training high skilled educators and understanding issues relating to academic development. ICTs have the potential for increasing access to and improving the relevance and quality of education. They represent potentially equalizing strategies for developing countries. ICTs greatly facilitate the acquisition and absorption of knowledge, offering universities unprecedented opportunities of enhancing education; improving policy formulation and execution; and widening the range of opportunities (Emmanuel &Ngozi, 2014).

ICTs as electronic or computerized devices enable individual or group to process and share information (Ofodu, 2007). Virtual communication or e-learning is considered as the use of ICT in education to enhance and support teaching and learning process (Yusuf, 2005). Therefore, ICT is a teaching tool that aids the education of students both on and off campus by means of teaching online offered via a web-based system (Pulkkinen, 2007; Wood, 1995). The higher education institutions around the globe have increasingly adopted ICTs as tools for teaching, curriculum development, staff development, and student learning.

It is widely acknowledged that ICTs can be used to improve the quality of teaching and learning in any tertiary institution. The prevalence and rapid development of information and communication technologies (ICTs) have transformed human society from the information technology age to knowledge based age (Galbreath, 2000). ICTs are becoming a common part of people's daily life; thus, their use in education by staff (academic and non-academic) and students is becoming a necessity. Certainly, the present and future academic global community will utilize ICTs to a high degree, this has made it imperative that lecturers do not only use ICTs, but that they are also comfortable using them(Yusuf &Onasanya, 2004).

ICTs are considered the application of digital equipment to all aspects of teaching and learning. The use of ICT has brought about rapid transformation that involves the use of computers, internet and other information technologies. It is through ICTs in this 21st century that University lecturers, can sit comfortably in their offices or elsewhere and conduct research or communicate with students, give lectures, send lecture notes, link or guide students on where to obtain learning materials, among others. With ICTs, communication of information and knowledge is being done in a more effective and convenient manner (Jimoh, 2007).

The information and communication technologies have given rise to new modes of organizing educational environment and has introduce new concepts in the teaching process as it offer access to up-to-date research reports and global knowledge. ICTs have become invaluable tools for communication, learning, teaching and collaborative research among academics (Nwezeh, 2007).

Dangani& Mohammed (2009) state that the use of information and communication technologies in teaching and research by academics has arisen because of the increase in demand for information andinformation sources. The information revolution and the extraordinary increase in the spread of knowledge have given birth to a new era of knowledge and information which directly affects all spheres of human life. Based on this trend, individuals, organizations and governments worldwide have recognized the role that information and communication technologies play in fostering growth and development, especially in the academia and research institutes.

Many developing countries face challenges in harnessing ICTs for their educational systems in other to promote broader economic and social development plans.This realization has madegovernments in developing countries to articulate broader visions for the development of information societies, in which widespread access and use of technology can increase and nurture human capital, improve government services, promote culture, and support economic growth. The ICT sector is targeted as a vehicle for this growth and social development and thus the educational sector has acrucial roleto play in such efforts as stated in Nigeria's (2014-2015) ICT Country Report **(**www.infodev.org).

According to Jager and Lokman (1999),the functions or use of ICTs in education are:

a. ICTs as object of learning;this refers to learning about ICTs as mostly organized in a specific course. What is being learned depends on the type of education imparted and the level of the students. Education prepares students for the use of ICT in education, future occupation and social life.
b. ICTs asassisting tool. ICTs are used as tools for example, working out assignments given, collecting data and their documentation, communicating and conducting research.
c. ICTs as media for teaching and learning. This refers to ICTs as tools for teaching and learning as they serve as media through which teachers can teach and learners can learn.

The significance of ICTs in this 21st century, especially in the learning institutions can hardly be over emphasized as the National Universities Commission (NUC) considers advancement in the utilization of ICTs as one of the major yardsticks in ranking universities in Nigeria. As posted on its website (http://nuc.edu.ng/), the 2016 ranking of the Nigerian universities shows that A.B.U (being one of the first generation universities in the country) did not rank among the first three in the countrybut rather is ranked number 6 out of 113 universities consisting of public and private universities. The ranking in addition to some other factors are connected to a large extent with availability, adoption and utilization of ICTs in the university.

1.2. Statement of the Problem

Information and communication technologies play important role incapacity building of the academics in the Nigerian universities in the area of conductingresearch, publication, teaching and communication. It is observed thatmany academics especially those in the lower and middlecadre know the importance of acquiring ICT skills for academic productivity and delivery.However, Archibong&Effiom (2009) in their study discovers that theuse of ICTs is more challenging to academics who arein higher academic positions and those thatlearn under poor ICT environment.

Not more than twenty years ago, the majority of the academics in the Nigerian universities relied heavily on the conventional manual method of conducting research and searching of bibliographies, abstracts and printed sources to update their knowledge or obtain information for research and publication. Nowadays the trend has changed as many academics now use ICTs in the academia. To this end, Dagani& Mohammed (2009) argue that ICT literacy is necessary in the scheme of things in the 21st century. A cursory observation reveal the use of some ICT tools by academic staff, with no empirical study of what they use the ICT tools for.

Several researches suggest that ICTs will be an important means of communication and knowledge delivery for this generation and next (Bransford, Brown & Cocking, 2000). For most developing countries, the use of ICTs in education and training have become a priority during the last decade. However, very few developing countries have achieved progress in using ICTs to support and change the traditional teaching method, research, communication and learning process in many universities. Others are still in the early phase of information and communication technologies adoption as some academics in Nigerian universities show resistance and at the same time have problem of technophobiatowards the use ICTs

(Suleiman,Manir& Muhammad, 2012). It is for this reason that the Federal government and MacArthur Foundation recently intervened by providing ICT facilities (fiber optic connection) in A.B.U and also nationwide digital appreciation workshop and training for higher institutions in the country with preference to universities. However, despite the interventions of the federal government and MacArthur foundation in Ahmadu Bello University, it is still observed that some academic staff are having challenges of technophobia and low skill in utilizing ICTs to discharge their academic duties. Despite the fact that this problem exists, there has not been recently published study on the use of information and communication technologies in research, teaching and communication by the academic staff of Ahmadu Bello University, Zaria. The only recent study on this was in2009 by Dagani and Muhammed 2009. Therefore, the present study should be seen as one of the series of research required for appreciating development and progress in the adoption and utilization of ICTs for performance enhancement in the Nigerian universities.

1.3. Aim and Objectives of the Study

The aim of the study is to examine usage of Information and Communication Technology among the academic staff of Ahmadu Bello University Zaria. The specific objectives are:

(1) To examine the usage of basic computer applications by the academic staff of Ahmadu Bello University

(2) To examine the awareness, access and utilization of academic e-resources by the academic staff of A.B.U

(3) To identify the challenges encountered by the A.B.U academic staff in utilizing ICTs.

1.4. Research Questions

The study is set to seek answer to the following questions:

(1) What basic computer application(s) are A.B.U academic staff capable of using?

(2) What types of academic e-resources are A.B.U academic staff mostly aware of and canaccess and utilize for research and teaching purposes?

(3) What are the challenges encountered by A.B.U academic staff in utilizing ICTs?

1.5. Significance of the Study

The study will help the management of Ahmadu Bello University, Zaria to know the strengths and weaknesses of its academic staff in relation to usage of computer application(s) in various disciplines. The results that emanate from the study will give an update situation analysis of the usage of ICTs in academic activities by the academic staff ofAhmadu Bello University, Zaria. The last time a study of such was conducted in the year 2009. This will help in giving the management afair knowledge about the capability of its academic staff's capability, competency, and experience in relation to various computer applications before effecting a change in the ICT policy of the university. In addition to this, the study willhelp the university management in knowing the kind of academic e-resources its staff can access and utilize for academic delivery.

Through thisstudy, the management of A.B.U will also know which academic e-resources to subscribe in view of the interest of its staff. Thefindings of this study will still help the management of A.B.U to identify areas of ICTs that constitute challenges to its academic staff with a view to finding solutions to them.

At the national level, the findings from this study will be relevant for the National Universities Commission (NUC) and the Nigerian Educational Research and Development Council (NERDC) in ICT capacity-building program for the Nigerian universities. The study has revealed areas of strength and weakness of lecturers in A.B.U in using computer applications in the academia. The use of ICTs by academics as it relate to teaching and research cannot be ignored, if good capacity and high productivity quality are to be achieved and sustained among academics in Nigerian universities.

Finally, the study will also be useful for further research as it can serve as reference material for researchers in the area of ICTs.It is also hoped that the study will contribute to the existing body of literature on the study of Information and Communication Technologies by academic staff of Nigerian Universities.

1.6. Scope and Limitations of the Study

The study was conducted on how ICTs are being used by the academics in research, teaching and communication in A.B.U, Zaria. The study also investigated the access and utilizing of academic e-resources for academic delivery.

The study specifically, has been delimited to the academic staff in the 12 faculties of A.B.U, Zaria, hence generalizing the study across all Nigerian universities may not be possible. These arefaculties of Agriculture, Arts, Pharmaceutical Sciences, Administration, Education, Engineering, Environmental Design, Law, Medicine, Science, Social Sciences and Veterinary Medicine. Ten faculties are situated in Samaru campus inSabonGari local government area while the remaining two are located in Kongo in Zaria local government. Both local governments are under Kaduna state.

Another limitation is that the study used only quantitative survey method which at the end has given quantitative results. If the study had used the quantitative aspect (questionnaire) for academic staff and used qualitative method (in-depth interview) for policy makers of the university to get their views or efforts been done to ease ICT challenges of the academic staff in the university. Combining the two methods would have added quality to this research work.

1.7. OperationalDefinitions

The following are defined within limit of this research work:

I. Academic staff:This refers to the teaching staff of the university which does notinclude academic technician who handle practical components of courses.

II. e-resources: These are Database, websites and online libraries that provides academic resources.

III. Basic computer application(s): These are basic computer soft wares that are needed/used in the academia.

IV. ICTs: This refers to computer applications aspect of information and communication technologies.

V. Awareness: This refer to knowledge about the existence of academic e-resources

VI. Access: This refers to availability

VII. Utilization: It refers to use or usage

VIII. Adoption: This refers to acceptance and use of ICTs

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1. Introduction

This chapter reviews relevant works of different scholars and bodies conceptually, empirically and theoretically on information and communication technologies. In the conceptual review, the chapter discussed the concept of information and communication technologies in general, the concept of e-resources, information and communication technologies as tool for communication in teaching and research, the availability and utilization of ICTs in the Nigerian universities and in developing countries. Equally, the empirical aspect of this chapter reviews studies conducted within and outside Nigeria with specific focus on adoption and utilization of ICTs as well awareness, access and utilization of academic e-resources in various academic environments.

2.2. Concept of Information and Communication Technologies (ICTs)

The invention of the computer is one of the greatest human creations that have had profound impact on the socio-economic life and history of humanity. Wyatt (1990) defines a computer as an electronic tool that is capable of accepting data, interpreting the data, performing ordered operations on the data and reporting on the outcome of the operations. Computer has the capacity of carrying out consecutive and simultaneous operations on millions of pieces of information in a predetermined manner within a short time.

Prior to the digital revolution, the analogue mode of communication seemed to have inhibited the consumption of information technology with communication technology. This was probably the reason for the restrictive definitions of information technology by some scholars. Roffe (1995) defines information technology as electronic based technology, which can be used to collect store, process and package information and provide access to knowledge.Langely and

Shain(1995) viewed information technology as the acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by microelectronic-based combination of computing and telecommunications.

Sansanwal (2000) defines I.T as the use of hardware and software for efficient management of information, i.e. storage, retrieval, processing, communication, diffusion and sharing of information for social, economic and cultural upliftment.Information Technology leads to the development of websites for government, corporate sectors, educational institutions, etc. It provides facilities for Chat, e-mail, surfing, etc. It opens up a new source of information.

The convergence and combination of information technology (IT) and telecommunication technologies have given rise to what we now know as Information Communication Technologies (ICTs). Lucas (2000) defines ICTs as “the hardware, software, telecommunication technology, human skills and intellectual content that enable the study, design, development, implementation, support, management, or use of intellectual expressions. This includes data, knowledge and language, in all digital, print, audio and visual formats. Information and communication technologies (ICTs) is a sum of technology tools and resources for creating, spreading, changing and managing the information.

Yusuf and Onasanya (2004) see Information and Communication Technology (ICT) as a computer based tool used by people to work with the information and communication processing needs of an organization. It encompasses the computer hardware and software, the network and several other devices (video, audio, photography camera, etc.) that convert information (text), images, sound, and motion, and so on into common digital form (Milken Exchange on Education Technology 1999 cited in Yusuf and Onasanya 2004). It is an eclectic application of computing, communication, telecommunication and satellite technology (Yusuf, 2000).

Putting all of the above definitions together, we can stand to see information and communication technology as a microelectronic-based combination of computing and telecommunications technologies for accessing, gathering, manipulating, presentation and communication of information. The technologies can capture, display, process, store and transmit information through electronic means (http://online.curriculu.edu.av). ICTs make possible and worldwide communication and exchange of information.Because of its unassailable technical and technological superiority over other previous technologies and synergistic value, ICT has simplified the coming together of the electronic, computer hardware and software, telecommunications, artificial intelligence and human machine interface (Oguntuase,2009).

UNESCO's definition of ICTs tallies with the one given by Lucas above. Far back in the 1980's, the American Library Association (1983) defines Information Technology as the application of computers and other technologies to the acquisition, organization, storage, retrieval and dissemination of information with a system dependent upon a micro-electronic based combination of computing and telecommunication technology.

Many scholars have attempted to list what constitute information communication technologies. Information and communication technologies include hardware and software, computers and networks, soft wares and applications, smart board, radio, television, video and digital cameras, telephone, e-mail, global system of mobile communication (GSM), CD – ROM, printers, scanners, overhead projectors and the internet (Idowu&Mabawonku 1999, Gates 1994, Davarpanah 2000, Kiplangat and Kwake 2005,Ozohu-Suleiman 2008,Dangani& Muhammed 2009). One important fact is that these technologies areused for the creation, storage, communication, management and manipulation of data and information.

2.3.e-resources

Electronic resources, popularly known as e-resources have become a major element of library collections worldwide. Electronic resources usually consist of online/offline book, journals, magazines, newspaper, online thesis, dissertation, online databases which are likely to be alternative through media. Sharma (2009) identifies e-resources to include e-journals, data archives, manuscripts, maps, books, e-magazines, e-theses, e-newspapers, e-mail, research reports, and bibliographic databases. Aramide and Bolarinwa (2010), mention A-V resources, instructional audio tapes, instructional video tapes, VCD/DVD, radio, television, multimedia projectors, e-resources and electronic databases, e.g., JSTOR, ERIC, e-documents, Internet/e-mail facility, CD-ROMS, computer network, telephone facility (GSM/Landline), and digital cameras. To Saye (2001), electronic resources are those e-resources generated through some electronic medium and made available to a wide range of viewers both on-site and off-site via some electronic transferring machine or internet.

Ohakire and Okwuanaso (2006) maintain that the Internet as an instrument for research and communication has opened up numerous possibilities for resource sharing at the local and global levels, and information on latest journals, books and transactions can be exchanged directly through the Internet. This has caused many libraries to move towards digital e-resources, which preferably is less expensive and more useful for easy access.

Likewise, Ojedokun and Owolabi, (2003) also stated that Internet resource is an invaluable tool for collaborative research among academic staff. However, Oketunji (2001) opined that the functions of the internet have always been to provide a way for academic staff to have better access to each other, and as a tool to facilitate research. He went on to say that, the internet is the world's most efficient means of communication when compared to other sources. Teachers will need to learn new skills to teach students how to search for and use information from the Internet safely. The Internet's seemingly infinite information offers access to up-to-date research reports and global knowledge (Nwokedi, 2007). So it has become an important component of electronic services in academic institutions. Therefore, the Internet has become an invaluable tool for learning, teaching and research (including collaborative research) in Nigeria.Olalude (2007) reports that it is a powerful and efficient tool for searching, retrieving and disseminating information among academics.Islam (2007) postulates that the application of web-based information retrieval trends of researches is ever increasing and that the electronic material will eventually replace the traditional library and users need not go there to find and collect information they need.

Commenting on the advantages of electronic resources, Dadzie (2007) writes that electronic resources are invaluable research tools that complement the print – based resources in a traditional library setting. Their advantages, according to her, 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 related contents. This rapid emergence and development of electronic information technologies therefore makes it possible to envision radically different ways of organizing the collections and services the library has traditionally provided. While libraries approach a crisis point in financing collection development, these new technologies offer possible ways to mitigate costs and revolutionize ways to access information.

On the other hand, e-resources are generally in the form of e-Books, e-Journals, OPACs, CD-ROMs, Online databases, internet resource, electronic link and web publishing etc. These are available either through open access or commercially (Kumar, and Kumar, 2008). Some of the academic e-resources currently available and used by the research scholars in some universities are described by Shaalan, and Latheefa (2006) and Ojedokun and Owolabi (2003) are:-

AJOL: is an acronym for African Journals Online. It is the world largest and pre-eminent collection of peer reviewed, African published scholarly journals. According to www.ajol.com, AJOL was formed in partnership with hundreds of journals from all over the continent to bring together African originated research output for African scholars and world at large. AJOL offers academic materials to virtually all disciplines and it an open access journal.

AGORA: is the acronym for the Access to Global Online Research on Agriculture program. It was launched in 2003 by the Food and Agriculture Organization of the United Nations (FAO) in partnership with Cornell University with the aim to provide free or low-price online access to leading peer reviewed publications in agriculture and related biological, environmental and social sciences. Coordinated by the FAO, the goal is to support the effective use of agricultural research, education and training by academics, students, practitioners and government personnel with access to high-quality, relevant and timely agricultural information. According to AGORA's website close to 3,000 institutions have registered with them worldwide, giving access to almost 6,000 journals and 22,000 books including subscription-based and open access information resources across a variety of topical areas. There are currently 28,000 total resources available online to institutions in over 100 countries, with over 15,000 new e-books added to the platform in 2016.

ARDI: is the Access to Research for Development and Innovation program, a partnership between the World Intellectual Property Organization and major scientific and technical publishers. ARDI provides access to nearly 10,000 online journals, books and reference works for patent offices, academic and research institutions in 107 developing countries.ARDI is aim at promoting the integration of developing countries into the global knowledge economy, allowing them to more fully realize their creative potential through availability of technical and scientific information. ARDI is part of Research4Life, the collective name for four scientific programs; HNARI (focusing on health), AGORA (focusing on agriculture), OARE (focusing on environment), and ARDI (focusing on applied science and technology). Research4Life provides developing countries with free or low cost access to academic and professional peer-reviewed content online.

DOAJ:an acronym forDirectory of Open Access Journals. It is database of open access journals covering all scientific and scholarly subjects. Primarily used to identify open access journal titles and forty percent of them are searchable at the article level. Journals can be browsed by title or by broad subject area. Articles are searchable by article author or title, ISSN, journal title, abstract, or key words. Full-text is not searchable but is fully accessible. DOAJ, journals are open access and as well free access to institutions and researchers. The project defines open access journals as scientific and scholarly journals that meet high quality standards by exercising peer review or editorial quality control. DOAJ is multi-disciplinary e-resource that covers a wide range of disciplines (www.doaj.org).

Questia: is an e-resource center or online library that provides access to the world's largest online collection of books and journal articles in the humanities and social sciences, plus magazine and newspaper articles. According to Questia.com, it is the world's largest online collection of complete books, journals and articles, searchable by word, phrase, title, author, or subject.

Google Scholar: is a freely accessible web search engine that indexes the full text or metadata of scholarly literature across an array of publishing formats and disciplines. Google Scholar index includes most peer reviewed online academic journals and books, conference papers, thesis and dissertation, preprints, abstracts, technical reports and other scholarly literature Google Scholar is estimated to contain roughly 160 million documents as of May 2014 (scholar.google.com).

HINARI: Itis also part of Research4Life, the collective name for four programs, which focuses on access to research in health program**.** It was set up by the World Health Organization and other major publishers to enable developing countries to access collections of biomedical and health literature. There are up to 13,000 e-journals and up to 29,000 online books available to health institutions in more than 100 countries (www.who.int/hinari.com).

PubMed: is a free search engine accessing primarily the Medline database comprises more than 26 million citations, references, journals, online books and abstracts on life sciences and biomedical topics. The United States National Library of Medicine (NLM) maintains the database (www.ncbi.nlm.gov/pubmed).

Jstor: It provides full-text online access to back issues of selected scholarly journals in the Humanities and Social Sciences. Other disciplines are Law, International Relations, Women Studies, Political Science, Conflict Studies, International Affairs and Governance (www.jstor.org).

National Academic Press: This is a multidisciplinary database with information on Conflict Studies, Political Science and International Relations among others (http://www.nap.edu).

Oxford University Journals:Oxford University Journals is a subscribed database that provides access to more than 100 journals. Coverage includes Social Sciences, Humanities and Law (www.oxfordjournals.org).

Policy Press: An online database provides coverage to articles, conference proceedings and government documents on social and political policies, Political Science, Public Administration, current affairs and related topics (http://www.ingentaconnect.com/content/ttp)

Wiley Publications: Wiley InterScience is a subscribed database that provides access to nearly 1500 journals in full text and reference works. Major subject areas are Law, Social Science, Humanities, Management and Engineering (www.interscience.wiley.com).

2.4. Information and Communication Technologies as Toolsfor Communication in Teaching and Research

Information communication technologies have become powerful tools for teaching, research and development activities, not only in the developed countries, but also in the developing countries in Africa. The coming of ICTs as tools in the academia has brought many novelties and essential changes in values, methods and results delivery. It would be an important benefit for the educational system if the novelties and changes brought by ICTs are accepted used and developed by students, teachers, school administrators, and decision makers in institutions.

Ekeke and Mbachu (2015) in their study on the place of information and communication technologies (ICTs) in teaching and learning in Nigerian tertiary institutions, argued that the use of ICT in schools by staff and students has become a necessity. It can be use in improving the quality of teaching and learning in institutions. ICT is also a key tool that is having a revolutionary impact on educational methodology globally.

Madhusudhan (2008) argued that no single teacher is capable of giving up to date and complete information in his own area without consulting the internet. The ICT can fill this gap because it can provide access to different sources of information. It can provide correct information as comprehensive as possible in different formats with different examples. ICT provides online interaction facility. Students and teachers can exchange their ideas and views, and get clarification on any topic from different experts, practitioners, etc. It helps learners to broaden the information base. ICT provides variety in the presentation of content, which helps learners in concentration, better understanding, and long retention of information, which is not possible otherwise. The learners can get opportunity to work on any live project with learners and experts from other countries. The super highway and cyber space also help in qualitative improvement of the Teaching – Learning Process. ICT provides flexibility to learners, which is denied by the traditional process and method. Flexibility is necessary for mastery learning and quality learning. On the internet many websites are available freely which may be utilized by teachers and students for understanding different concepts, improving vocabulary, developing reasoning and thinking among other things (Sansanwal, 2009).

There is a consensus that the use of ICT in teaching and learning brings about positive benefits in student learning. The findings of the ImpaCT2 survey Harrison, Comber, Fisher, Haw, Lewin (2002) provide concrete evidences of ICTs having positive impact on teaching and learning in the classroom. At the subject level other than mathematics, ICT supports the development of science concepts (Nakleh&Krajcik, 1994). Friedler and McFarlane (1997) found that that students' ability to interpret data improves with the use of data loggers. Harlen (1999) in his review of literature, suggests that data-loggers and simulation in practical work improves learning when used in appropriate ways. Similarly, Cholmsky (2003) gives evidence of improvements in learning when simulations are used. Barton (2004) argues that data logging could change the nature of children's thinking in experimental work in science.

It is widely acknowledged that ICTs can be used to improve the quality of teaching and learning in any tertiary institution. Information and communication technologies offer several opportunities in education. First, they can be used as means of preparing the current generation of students for future workplace that is, providing tools for tomorrow's practices. This is underscored in the foreword written by Lemke (1999) in the Milken Exchange on Education Technology commissioned report. Lemke noted inter alia "Today's students live in a global, knowledge based age, and they deserve teachers whose practice embrace the best that technology can bring to learning". Through teachers' use of technology (ICTs), students can be given the opportunities of becoming a part of the knowledge age and skills imparted to the young people in an increasingly complex world. Lecturers will need to use ICTs in order to equip tomorrow's employees and customers with the requisite competence and knowledge to use ICTs within their work (Davis &Tearle, 1999).

Information and communication technologies are essential tools in any educational system. They have the potentials of being used to meet the learning needs of individual students, promote equality of educational opportunities; offer high quality learning materials, increase self-efficacy and independence of learning among students, and improve teachers' professional development. Furthermore, ICTs offer great potentials for revolutionizing school administration (Kirschner&Selinger, 2003; Williams, 2003).

Good (2005) says ICT in teaching and learning is certainly going to promote another good form of communication between the teachers and the students especially those in tertiary institutions. Academic networking using ICTs is possible among academicians and even with their students across the globe. Excellent and current learning materials are required from academic staff to promote the quality of education and their product. Teachers who are already fearful of the technology will become more reluctant when the use of ICT is mandated on them. There has been some optimism among teachers in Nigerian universities, that a thorough understanding of effective ICT use would enhance motivation to use ICT with their students. Due to the rapid growth of IT technology, ICTs have become indispensable ingredient in the process of teaching and learning in Nigerian Universities. One important factor for effective use of ICT in Universities is that teachers should believe that ICT will improve their teaching and their students' learning. (Keegwe, Onchwari, &Wachira, 2008) cited in (Oye, Salleh, &Iahad 2011).

Yusuf and Onasanya (2004) assert that ICTs can make school more efficient or more productive, engendering variety of tools to support and facilitate teacher's professional activities. ICTs are seen as means to reform and innovate teaching, that is, to stimulate learners to learn actively and independently in a self-directed way and/or in collaboration with others. Kirschner&Woperies (2003) ICTs can be used to enhance learning and teaching within a university system.

Modern technologies, especially the ICTs, offer many means of improving teaching and learning in the classroom (Lefebvre, Deavdelin&Loiselle2006). Dawes (2001) is of the view that new technologies have the potentials to support and improve education across various disciplines and professions, and theycan provide opportunity for effective communication between teachers and students in ways that have not been possible before. ICTs in education also have the potentials of bringing about changes in ways of teaching, researching and communication among scholars and students worldwide.

Bransford Brown & Cocking (2000) argued that several studies have reviewed literature on ICTs and learning and have concluded that ICTs have great potentials to enhance student achievement and teacher learning especially in the tertiary institutions. Wong, Quek, Divaharan, Liu, Peer and Williams (2006) also added that technologies can play a part in supporting face to face teaching and learning in the class room. Many researchers and theorists assert that the use of information and communication technologies in both virtual and physical form can help students become knowledgeable, reduce the amount of direct instruction given to them, save lectures' energy, and it gives tutors the opportunity to help students with particular needs (Inding, Crosby, Speitel 2002; Shamatha, Peressini, Meymaris 2004 and Romeo, 2006). It is agreed that technologies can help teachers or scholars enhance their pedagogical or teaching practices. They can also assist students in their learning. Grabe and Grabe (2007), cited in Khalid (2009), also concurs that technologies can play many roles in student skills, motivation and knowledge. They claimed that ICTs can be used to communicate current information to students and help them to complete learning task.

In the findings of studies on the use of ICTs as tools of research teaching and communication, Müller-Falcke (2006); Wang and Woo(2007); Hirtz, Harper and Mackenzie (2008); Brown(2005); Toure (2009) and Law(2000)agree that students with easy and wide access to information, easily develop their thinking and promote their personalities develop. Possibilities of independent work is developed, sense of humor and critical approach is formed, skills and knowledge are formed, and co-operative learning is also promoted. Aija and Inga (2012) postulates that technologies make learning environment alive and active. In the age of information technologies, traditional educational methods are not effective enough. Present system of education demands introducing quick and non-traditional educational methods and forms in the educational process, what could make the educational process more active and motivate students for self-education. The process mentioned is very complicated and demands teachers and students to obtain skills to work with IT tools and software. Computer, interactive board, multimedia data projector, internet etc.

Talhami (2009) stresses thattechnology tools have afforded new possibilities for teachers in the teaching process and for students in the learning process. It gives access to non-traditional informational sources, raises effectiveness of self-education, promotes creativeness, and brings to realization new educational forms and methods. Success of education depends on that how quickly and easy we can get information of different amount.

Colwell (2000) pointed out the potential of ICTs in research when she noted thatno field of research will be left untouched by the current explosion of information and communication technologies. Indeed, science used to be composed of two endeavors – theory and experiment – but today it has a third component computer simulation, which links the other two. ICTs can guide lecturers into new frontiers in basic and fundamental research. Specific areas of relevance of ICT to lecturers in the areas of research are communication with one another through e-mail mail lists, newsgroups and chat rooms. These ICT resources enables communication between scholars as they can post research, assignments book or journal lists references to on-line materials. Problems and solutions can be discussed between researchers and scholars can react to the work of others in an electronic manuscript. ICTs further provide greater opportunities for research collaboration and networking among scholars spread throughout the world, thus the national and international dimension of research issues can be studied, as they can allow for communication with peers and experts around the world. Through collaborative knowledge building, studies can spotlight transnational trend analysis through human and instrumentation collaboration (Nweze and Chenwe, 2010).

2.5. Availability and Utilization of ICTs in Nigerian Universities

A number of writers have addressed the issues of availability, accessibility and utilization of ICTs, particularly in respect to teaching and research. Oliver (2003) notes that teaching and learning in universities require access to a variety of information sources, information forms and types by students and teachers, and this calls for the adoption of ICT in universities. In order to remain relevant and up to date in the current information age, university lecturers and students have to adopt ICTs to enhance their teaching, learning and research activities.

Barracket and Scott (2001) states that the availability of ICT facilities might hinge on affordability or costs of access to ICT. Oduwole (2000) andJegede (2001) observes the growing importance of ICTs in universities in Nigeria when they reported the increasing rate of acquisition of computers by both staff and students in few Nigerian universities. They discovered that the degree of availability and utilization of ICT in large number of Nigerian universities and their class rooms is still low observing that some universities are just making efforts to adopt ICT.

Dangani& Muhammed (2009) in a survey research of Information and Communication Technology Literacy among academics in Ahmadu Bello University Zaria discovered that computer system, CD-Rom, flash drives, printers, scanners and mobile phone were most available ICT facilities in A.B.U Zaria.

Patterson and Wilson (2000) said the adoption of ICTs for use is not only determined by the number of facilities provided, but also by the social and economic systems in which such facilities are embedded. Bondaryk (1998) affirms that awareness, willingness to use and ability to use are important basis for the adoption of any learning tool in higher education. Speaking in the same vein, Webb (1998) stated that the main and only mission for an academia to exist is to make the necessary technology available and utilize them.

Carlson and Gadio (2002) states that teacher training in the use of ICT is the best starting point in the ICT policy of a country because they are the key to making learning happen. This, according to them, is so because teachers who succeed in making use of ICT in their work process, do not only contribute to improved learning outcomes in their students, but may also benefit personally from enhanced work productivity, reduced isolation and increased professional satisfaction.

Atinmo (2000) argues that one critical issue that has been affecting availability and, by extension access and use has been the need for university administrators to carry out feasibility studies and staff training before embarking on the provision of ICT facilities in both class rooms and offices. Kreizman (1999) supports the idea of feasibility studies and appropriate training before installation of ICTs in universities. Haliso (2005) opined that availability of ICT does not necessarily imply utilization. Again, he observes that what is not available cannot not be accessed or utilized. What can make ICT available and accessible is the possibility of utilization.

Individual capacity and ability to utilize and optimize information is crucial to the level and quality of the individual productivity. Opeke (1984) identified information capacity as an important factor in effective ICT utilization. The information capacity of an individual may depend on the information environment in which the person operates.

Information is the basic resource that adds to individual and organizations better performance and productivity especially those who are operating in the knowledge economy. According to asurvey of ICTs and Education in Africa; Nigeria Country Report (2007)stated that the National Universities Commission (NUC), the government agency responsible for registering and regulating universities, has prescribed 12 PC ownership for universities as follows: one to every four students, one PC to every two lecturers below the grade of Lecturer 1, one PC per Senior Lecturer, and one notebook per Professor/Reader. While some universities, like the NnamdiAzikwe University and the University of Ilorin have achieved a better ratio for their faculties, the same cannot be said of the PC-to-student ratio.

Many universities in Nigeria today are connected to the internet and they have their Websites. University of Ibadan, Ahmadu Bello University, University of Ilorin, University of Lagos, among other universities now conducts their postgraduate admission through the internet. The National Universities Commission (NUC) has plans to provide satellite connectivity to all universities in Nigeria. In any case, many Nigerian Universities have their own VSAT. Studies revealed that most of the lecturers have internet connectivity in their offices(Ogunseinde 1996).

In an effort to make ICT available and accessible, the Nigerian government in 1996 through the ICT regulatory agency, the Nigerian Communication Commission (NCC), licensed eleven companies as internet service providers (ISP) to offer internet services to the public. Hall (1998) reports that there were internet hosts in Nigeria.With the deregulation of telecommunication in 2002, and with the licensing of four GSM operators, the stage had been set for sporadic upsurge in the use of information and communication technology. However, the noticeable improvement in the availability and access to ICTs in African universities had been handicapped by the problem of electricity, which had adversely affected the installation and operation of computer networks (Talhami,2009).

When ICTs are made available, access has to be created to facilitate their utilization. Access to information and communication technologies is very crucial for participation in the information ‘society and the information age. Okwilagwe and Njoku (2002) concludes in their study that ICTs are available and accessible to book publishing organizations for book marketing in Nigeria. However, in-equitability prevails in the segments of the Nigeria economy. The electronic environment is filled with electronic items in digital formats items that can be stored, easily accessed and manipulated through personal computer, the telephone and even the television. The internet, computer discs and CD-ROMs, among others populate the electronic environment.

Mutula (2000) espoused the benefits of having access to ICTs by noting that the internet as an integral part of ICT has facilitated the information revolution with the capability of communication and transfer of information as text, images, audio, and video with unbelievable speed, and cheaply around the world.

Malhotra (2004) maintains that academics must be able to identify, locate and evaluate relevant information to meet their information needs in addition; they must have a working knowledge of word processing, statistical package software, and PageMaker. Apart from the use of e-mail, internet offers electronic reference and learning tools with hypermedia capacities. The power of the internet and the World Wide Web has propelled myriads of powerful technologies for the purpose of information utilization. Strassmann (1997) states that it is not computers that matters, but what people do with them. Much as the use of ICT can transform the nature of work and improve business performance, it is important that users adopt techniques with technologies so that effective performance can be achieved. Technique is a vital factor in using any modern technology, in that the ability a person has to control, manipulate and interact with the machine improves performances.

2.6.Information and Communication Technologies in Developing Countries

There is no doubt that ICTs offer developing nations lots of opportunities in virtually all sectors. Education is a critical component of the Information Society and is important in two capacities. Initially, experts are needed to provide and educate in the installation and maintenance of ICTs, to provide content and tools and to demonstrate the use of these applications. When a certain degree of human capacity building has been achieved, ICT also helps in delivering education more efficiently (Alexander,n.d).

Heeks (2002) argues that understanding information and communication technology (ICT) use in developing countries tends to focus on the informational power of ICTs. Benefit comes from the product, the output of the ICTs, so success often depends on information being accurate and locally appropriate.A quite successful and implemented case of ICT in education is the African Virtual University (AVU). It uses modern information and communication technologies to give the countries of sub-Saharan Africa direct access to some of the highest quality academic faculty and learning resources throughout the world. It aims at bridging the digital divide by training scientists, engineers, technicians, business managers, and other professionals who will promote economic and social development and help Africa leapfrog into the Information Society (Wolff, 2002).

The World Bank report on the African Virtual University (2003) points that most African countries have limited ICT-related tools, infrastructure and trained personnelamong other challenges of ICTs in Africa. These problems are exacerbated by the occurrence of power shortages, digital illiteracy and poor connectivity. The report also added that few universities have access to ICT tools and that in most cases, these tools are not always functional. The African Virtual University (AVU) is attempting to nurture a skilled and knowledgeable workforce from within Africa that will over time, contribute to economic development. It is thus contributing to the development of Africa's human capital. Although ICT gadgets have been widely available in the educational setting for well over two decades, a concern remains that teachers are neither confident nor competent users of ICT. The challenges facing the Nigerian public universities in relation to ICT acceptance and usage for teaching and learning is primarily lack of commitment by the government in terms of funding, staff training and stable power supply(Ijeoma, Joseph& Franca, 2010; Oye, Salleh, &Iahad, 2011).

There is also a widerange of impediments against the effective use of information and communication technology in Africa and by implication Nigeria. Jansen (1997) identifies some factors that impede the use of ICT in Africa as low level of computerization in many countries, scarcity of computers. Lack of proper guidelines on the use of computer facilities, limited training and lack of skilled manpower, lack of mechanisms to improve collaboration in areas of electronic networking, vandalism of network infrastructure, high import duties on ICT equipment, high price of internet services in some countries and lack of internet bandwidth. The fact is that these constraints differ from one country to another. Wema and Nawe (2000) identify the obstacles that hamper computerization at the University of Dares Salam as insufficient equipment, insufficient manpower, erratic power supply, high costs of infrastructure, staff indifference, donor dependency, lack of in-house maintenance program and underutilization of computers and other ICTs. Oketunji (2001) outlines the following as problems facing ICT use in Nigerian universities: inadequate telecommunication facilities and power supply, unsatisfactory after sales maintenance and support, inadequate technical staff, staff and users' resistance to the use of computer technology, conversion problems and incessant changes in technology.

Omolayole (2002) mentions some pervasive issues that seem to cut across all countries in Africa. They include low level of computer culture, general lack of awareness or poor ICT skills and poor telecommunication infrastructure. Chisanga (2004) found from a study that lack of fund and inadequate personnel with ICT skills constitute the main problem of ICT in universities.

Ehikhamenor (2002) identifies some other limiting factors for the use of ICT in Nigerian Universities to include high rate of inflation, unfavorable exchange rate,low wage level, high cost of technology, inadequate funding, low gross domestic product (GDP) and political instability.

2.7. Review of Empirical Studies on ICTs and e-Resources

Several empirical studies have been conducted on information and communication technologies, usage of computer applications, awareness, access and utilization of academic e-resources and as well as challenges in relation to usage. For instance,Biddiscombe (2001) says utilization is a critical issue in ICT especially the computer component. The purpose of using ICT for education is to enhance teaching and learning through the provision of a new powerful set of tools, such as the internet, with an almost inexhaustible source of information that allows academics and students to have access to current information from different areas for their productivity. Utilization and skills acquisitions in ICTs are integrated duo that determine largely the reach of any aspiring professionals, be it librarians or teaching academics.

Research has shown that proper utilization of ICTs for information and knowledge gathering, processing, storage, teaching, and learning has huge effect on education and performance in universities not only in the developed countries but, also in the developing countries like South Africa, Ghana, Egypt, Nigeria (Shoham, 1998; Ojedokun, 2000; Becker, 2000; Mutula, 2001; Mabawonku and Okwilagwe, 2004; Akinyosoye and Oguntuase, 2007).

From her study of the dimension of perceived accessibility to information among scientists and engineers, Culnan (1985) found differences among her respondents on what constitutes accessibility to include proximity, prior experience, and ease of use and availability of workstation. Abels, Liebscher and Denman (1996) studied factors that influence the use of electronic system among science and engineering academics in some universities. It was established from their findings that availability of technology (system) at workstation was the primary factor that influenced it usage

Isah (2010) in his study of electronic library use at the University of Ilorin demonstrated that academic staff are fully aware of the electronic library resources. The majority of the respondents (70%) claimed that they do not visit e-library to access e-resources, while only 36.6% indicated that they access the e-library resources from their offices. Respondents are computer literate. However, slow internet access, power outage and non-availability of e-resources relevant to their information needs were indicated as hindrances to the use of e-library.Ajuwon (2003) also carried out a study of uptake of ICTs by health science students at the University College Hospital, Ibadan. The study found that 57% of the students sampled could not use computer, and as such the use of the database was poor, due to lack of awareness, lack of access to computers, insufficient training and the high cost of provision.

Oduwole&Akpati (2003) sought to know the electronic resources provided by Nigerian libraries. When asked what electronic resources they provide, Nigerian university libraries identified Online Public Access Catalog, CD-Rom databases, electronic mail (e-mail) and Internet browsing. The study found that students constitute the major category of users of electronic services in the university libraries surveyed. Ojedokun and Owolabi (2003) reports that e-mail is the most used Internet resource by both staff and students in most universities in Africa.

Nweze and Chenwe (2010) also found in their study of Obafemi Awolowo University that the majority of lecturers always refer to e-resources platforms peculiar to their areas of specialization or discipline. However, they argued that one cannot rule out the fact that some lecturers in the institution consult e-resource platforms that are open for all disciplines. E.g. Google scholar, Science direct, Journals of interdisciplinary, JSTOR among others.

In the context of developing countries, Okello-Obura and Magara (2008), cited in Egberongbe (2011), investigates electronic information access and utilization at the East African School of Library and Information Science, Makerere University,Uganda. Out of the sample of 250 students drawn, 190 responded, giving a response rate of 76%. The study revealed that users derived many benefits from electronic resources, gaining access to a wider range of information and improved academic performance as a result of access to quality information.

Kinengyere (2007) states that the availability of information does not necessarily mean actual use. This showed that users are either not aware of the availability of such resources, they do not know how to access them, or they do not know what they offer. The study suggested that this calls for continued information literacy program. Over the years, the Internet has become an all-important technological tool in the production, marketing, and use of information worldwide. Elizabeth and Ronke (2005) found that slow download, power outage and lack of personal computer as factors militating against the use of online academic resources by the lecturers of OlabisiOnabanjo University.

In another study by Zhang, Ye and Liu (2011), it was found that electronic resources are used for conducting scientific research, teaching, and for self-development. Bar-Ilan, Peritz, and Wolman (2003) conducted an extensive survey of the senior academic staff of the Israeli University on their usage of electronic journals and databases. The major findings were that the use of electronic sources is already widespread among the respondents and that more than 50% found the electronic services indispensable. Disparities were found in usage patterns between the different disciplines. Madhusudhan (2008) found that 69.23% of research scholars of the faculty of engineering use e-journals for research work whereas 35.29% of the sciences use e-journals to update knowledge and 23.70% of the Engineering Faculty use these for study. However, Finholt and Brooks (1997) in a survey of usage of e-resources found that faculty members from the humanities, economics, and social sciences use online catalogues, full-text electronic journal databases, JSTORE and abstracting and indexing databases for research activities.

Ehikhamenor (2011) investigates the ‘Use and Impact of Electronic Resources at the University of Lagos Nigeria’. The findings showed that only 28.6% of the lecturers were not aware of the library electronic resources, 69.8% of the lecturers are fully aware and utilize the e-resources accordance with their area of interest as aresult of training received on the use of electronic resources.

Renwick (2005) examines the knowledge and use of electronic information resources by Faculty at the University of West Indies. The findings showed a high level of awareness (80%) of electronic resources made available by the library; but low use of the e- library’s’ specific resources. while(83%) of the respondents acquired skills to use electronic resources through self-teaching, and they still expressed a need for training. The highest use of electronic resources was for communication (86%), followed by research (77%), support of teaching activities (74%) and for administrative purposes (41%). However, Kanaujia and Satyanararayana (2003) study revealed that in addition to browsing the web consistently, users consulted e-journals regularly on the internet, to find online databases and for self-development.

Onasanya, Shehu, Oduwaiye, and Shehu (2010), in a comparative attitude study, established that science-oriented lecturers’ attitude towards integration of ICTs into higher institutions and usage of academic e-resources is higher than non-science oriented lecturers. Less and moderately experienced lecturers are more exposed to the use of ICTs than highly experienced lecturers.

Al Ansari (2006) focuses on the Internet use by the faculty of medicine including purpose of use, impact on teaching and research, Internet resources that they use and the problem faced while using the Internet. It was discovered that the majority of them have been using the computer and Internet for more than five years. The Internet has helped them save time, find up-to-date information and compare with their colleagues. Almost all of them want to improve their Internet use skill through formal training.

Madhusudhan (2007) in a survey conducted on Internet use by research scholars at Delhi University, reveals that most respondents used search engines more than subject gateways or Web directories to locate information. Academics use the opportunity to associate with colleagues who have made important contributions to human knowledge. The entire faculty (100% members) were reported to be using the EIR for subject knowledge update, for writing research/review articles and for proposed research.

On the other hand, Azubogu and Madu (2007) observed that academic staff of Imo State University, Owerri, have resorted to the use of computer and Internet technologies to search for information because the university library lacks funds to subscribe to scholarly and research journals.

Gubahar (2008) in his study reveals that fresh lecturers in tertiary institutions are willing to use technology, but that the problem is that there are no lessons to equip them with skills that will transform them into technology competent teachers. However, in another study by Archibong&Effiom (2009), it was found that lack of interest, limited access to ICT facilities and lack of training opportunities constitute the major problems of ICT adoption by university academics. Ijeoma, Joseph & Franca (2010) opined that inadequate ICT facilities and excess workload are major challenges to ICT usage among academic staff in Nigerian universities. Given that, the academics are the key to effective usage of information technologies in the university educational system. Ojedokun and Owolabi (2003) cited in Nwezeh (2007), stressed that lecturers in tertiary institutions in the developing world will have to change their teaching styles and acquire ICTs skills as new technologies transform classrooms over the next 20 years.

Socio – economic factors have also been identified as the problems affecting ICT utilization in Africa in general and Nigeria in particular. Some of these factors include availability and affordability of ICT, economic situations such as costs and the level of income as well as socio-cultural factors. Until recently, the provision of ICTs in universities was not accorded priority by the management of many universities in Nigeria. This has prevented many scholars from access to resources to improve their research capability (Nwezeh, 2007).

Zulu (1994) identified some limiting factors hindering effective utilization of ICT in developing nations. These are inadequate and unreliable supply of electricity, lack of conducive environment, lack of good telecommunication infrastructure and lack of qualified technical expertise.These obstacles must be surmounted for the universities to enjoy quality ICT utilization. Electricity supply has been identified as the single most critical infrastructure for ICT development in our universities. The issue of electricity in Nigeria has necessitated incurring extra cost on standby generators and expensive uninterruptible power system. In addition, there is poor alternative energy supply such as the solar power despite abundant solar energy in Nigeria. There is equally poor electrical protection systems for electrical equipment and appliances.

Raseroka (1999) summed up the obstacles and problems in the use of ICT in universities in the following way:

> The poor telecommunication infrastructure, in terms of quantity and quality, constitutes a major problem to ICT development in universities;

The absence of a National Information Communication Infrastructure (NICI) policy, plans and strategy;

Internet points of presence in the country may not be reachable by the university through a high-speed telephone system or wireless connection;

Connectivity problems and, in particular, the issue of limited bandwidth, which usually leads to traffic congestion in the network;

Gross underutilization of existing infrastructure due to ignorance, lack of awareness and in some cases, due to lack of interest or commitment; and

Low bandwidth ICT tools for teaching, research, distance education and distance research collaboration.

2.8. Theoretical Frame Work

UTAUT and Uses and Gratification theory:

The study adopted the Unified Theory of Acceptance and Use of Technology (UTAUT) and Uses and Gratification theory as theoretical framework. Venkatesh, Morris, Davis and Davis propounded the theory in the year 2003. The UTAUT theory consists of four core variablesPerformance expectancy, Effort expectancy, Social influence, and Facilitatingconditions. While,Gender, Age, Experience, and Voluntariness of use are posited to moderate the impact of the four core variables on usage intention and behavior (Venkatesh, Morris, Davis and Davis 2003).

According to the theory, Performance expectancy represents the extent to which using a technology will enable users to improve their job performance. In other words Performance expectancy is the degree to which an individual believes that when he or she uses the system, it will help him or her improve job performance. Effort expectancy is the degree of ease associated with the individual's use of the system. Effort expectancy denotes the level of ease associated with the use of the technology. Effort is of great concern to users during their initial use of the system. Social influence is the degree to which an individual perceives that important stakeholders believe he or she should use the new system. Social influence refers to the level of influence exerted by the individual's social settings, which could influence users' intent towards using the technology. Social influence is one of the constructs that directly influences intention to use technology systems application. Facilitating conditions represents the level of support and infrastructure present in an organization, which could enable system adoption or usage.

The development of the UTAUT theory was through a review, consolidation, incorporation and testing of variables of eight famous theories/models in diverse discipline that have previously been employed to explain information systems usage behavior or users' technology acceptance. The Models/Theories were integrated in terms of their conceptual differences as well as empirical resemblances (Jackson, Park, Probst and Yi, 2006).The eight Models/Theories used include the Theory of Reasoned Action (TRA) (Fishbein and Ajzen1975). Technology Acceptance Model (TAM) (Davis 1989), the Theory of Planned Behavior (TPB) (Ajzen1991), the Combined TAM and TPB (C-TAM-TPB) (Taylor and Todd 1995), the Diffusion of Innovation Theorem (DOI) (Rogers 2003). The Social Cognitive Theory (SCT) (Bandura 1986), the Motivational Model (MM) (Davis, Bagozzi and Warshaw1992) and the Model of PC Utilization (MPCU) (Thompson, Higgins & Howell, 1991). The consolidations of these eight theoretical models have been proposed to simplify the understanding of factors impacting the acceptance and use of information technologies. These contributing theories and models have all been widely and successfully utilized by a large number of previous studies of technology or innovation adoption and diffusion within a range of disciplines including information systems, marketing, social psychology, and management(Venkatesh, Morris, Davis and Davis 2003).

The UTAUT theory has been used in many empirical media/communication studies. Noor, Mohamad, Anna and Leelanayagi (2014) conducted a study in Malaysia with the aim of examining awareness and adoption of Goods and Services Tax (GST) application system, using the Unified Theory of Acceptance and Use of Technology (UTAUT) model at the organizational level. The results showed that reasons for non-adoption of GST application in Malaysia are directly related to all variables of UTAUT, except for facilitating conditions.

In another empirical research, Im, Hong & Kang (2011) examined the relationships of the constructs/variables in the UTAUT theory to determine how they are affected by culture. In the study, data from Korea and the U.S. were used to examine two technologies: the MP3 player and

Internet banking. Results showed that the UTAUT theory was found to fit data from the study. The comparison of Korea and the U.S. revealed that the effects of effort expectancy on behavioral intention and the effects of behavioral intention on use behavior were greater in the U.S.

Many researchers have also extended the UTAUT theory and as is being tested to show the level of success of introductions of new technology. Lin and Anol (2008) postulated an extended model of UTAUT, including the influence of online social support on network information technology usage. They surveyed 317 undergraduate students in Taiwan regarding their online social support by using instant messaging and found that the UTAUT theory is a useful theory to study the use of online social support. San Martin and Herrero (2012) explore the process of adoption and use of new Information Technologies by the users of rural tourism services and, more concretely, the underlying psychological factors of individuals that explain their intentions to make bookings or reservations directly through the websites of the rural accommodations (online purchase intentions).

Lee, Cheon, Crooks & Song (2012) compared the acceptance of mobile technologies across Korea, Hong Kong, and Taiwan. They argued that the variances of users in various cultural groups in each country were often larger than the variances across countries. They measured four major cultural dimensions (uncertainty avoidance, individualism and collectivism, context, and time perception) at the individual level, instead of at the country level; their study showed that the cultural dimensions had significant effects on individual users' adoption and use of technologies. One limitation of their study, however, was that they compared countries with similar cultures in East Asia.

Uses and Gratification Theory:

This theory stresses that different people use the media in different ways in order to obtain different sorts of pleasure or fulfill different sorts of need. Individuals are viewed as active interpreters and choice makers, rather than passive receivers of media messages in this case technology.

According to McQuail (2010) the basic assumption of the uses and gratification approach are:

1. Media content and choice is generally rational and directed towards certain specific goals and satisfaction (thus the audience is active and audience formation can be logically explained).
2. Audience members are conscious of the media-related needs which arise in personal (individual) and social (shared) circumstances and can voice these in terms of motivation.
3. Broadly speaking, cultural and aesthetic features of content play much less part in attracting audiences than the satisfaction of various personal and social needs (e.g. for relaxation, shared experience, passing time).
4. All or most of the relevant factors for audience formation (motives, perceived or obtained satisfactions, media choices, background variables) can in principle be measured.

He also suggested the following types of uses and gratification available from the media

a. Diversion: an escape from routine.
b. Personal relationship: i. Surrogate membership of a community
   ii. By enabling us to operate better in a real community.
c. Personal identity: Helping us to explore and confirm our identity.
d. Surveillance: the feeling of knowing what is going on.

In applying the principles of the uses and gratification theory to this study it means that the audience/users of ICTs or basic computer applications fulfill different sort of needs. With the above taken into consideration, it can be said that whatever the response of the users of ICTsis going to be as regards the basic computer applicationswill depend largely on whether or not the application/ICTs is meeting their needs. Their respond will also depend on their use of the application/ICTsas well as the gratification they get from the program.

The Uses and gratification theory has been used as a frame work for several audience based survey and research over the years, some of them are highlighted below:

In evaluating the perceptions of the authenticity of reality program and their relationships to audience involvement, enjoyment, and perceived learning, Hall (2009) investigated whether viewer perceptions of reality programs' authenticity were associated with involvement, enjoyment, and perceived learning in the United States of America. Four dimensions of perceived authenticity were identified: cast eccentricity, representativeness, candidness, and producer manipulation. The Uses and gratification was used as a frame work for the study being an audience based research.

Similarly, an Audience Survey Conducted on "Dewel" radio program in Ethiopia by Freyhiwot&Negassa in 2008 used the Uses and gratification theory as a framework in assess the program's performance in achieving its objectives. They discovered that the 'Dewel' program which is health based has had relative success in achieving its objectives based on the audience response. According to Freyhiwot&Negassa (2008) Uses and Gratification approach, therefore, reminds communication planners of the importance of competence, empathy and quality in communication, due to the assumption that the audience does not accept everything that is offered by the mass media.

Onyekosor&Nwankpa (2014) also used the Uses and Gratification approach to investigate the relationship between television program preference and perception of crime among youths in tertiary institutions in Port Harcourt, Nigeria. Severin and Tankard, 2001, Folarin 1998, as cited in Onyekosor&Nwankpa (2014) while explaining uses and gratification approach, says that the theory perceives the recipient as actually influencing the effect process, since he selectively chooses, attends to, perceives and retains the media messages on the basis of his/her needs, beliefs etc.

Based on the discussion above, UTAUT and Uses and Gratification theory areuseful to this study as it provides a comprehensive theoretical support for the study.

2.9. Critique of UTAUT& Uses Gratification Theory

Literature review shows that although the UTAUT is a robust and validated model in different contexts, there are some limitations to it. Based on the well-established theories in information system (IS) and social psychology, behavioural intention mediates the influence of various belief and external variables on behaviour and is an important predictor of behaviour; however, it has three limitations according to Moghavvemi, Salleh&Abessi (2013), the first being that behavioural intention is a reflection of an individual's internal schema of beliefs (Venkatesh, Morris, Davis and Davis2008), and it does not represent the external factors that can affect the performance of a behaviour.Thus, the role of external variables that can potentially impede or facilitate the performance of a behaviour is not fully captured by behavioural intention (it does not fully consider all possible external factors in facilitating condition construct as external factors). Secondly, behavioural intention has a weak predictive and explanatory ability to deal with uncertainty and unforeseen events between the time the intention is formed and the behaviour is performed. In the face of new information, an individual belief and behavioural intention can and might change. According to Venkatesh, Morris, Davis and Davis(2008), various internal and external stimuli can drastically change the provisional intention over time, rendering behavioural intention inaccurate, unstable and less predictive of behaviour. Lastly, behavioural intention has a weak ability to predict behaviours that are not completely within an individual's volitional control.

In a critique of the uses and gratification theory, Baran& Davis (2009) identified the strengths of the theory. They stated that the approach focuses attention on individuals in the mass communication process and respects intellect and ability of media consumers. It also provides insightful analysis of how people experience media content and differentiates active uses of media from more passive. They also identified that it studies the use of the media as part of everyday social interaction and provides useful insight into adoption of new media.

Baran& Davies (2009) also noted the weaknesses of the theory. They claim that it relies on functional analysis, which can create bias toward the status quo and cannot easily address the presence or absence of effects. They also mentioned that many of the uses and gratification key concepts are criticized as unmeasurable and it is too oriented toward the micro level.

However, Ruggerio (2000) stated that though some mass communications scholars have contended that uses and gratifications is not a rigorous social science theory, he argues just the opposite, and any attempt to speculate on the future direction of mass communication theory must seriously include the uses and gratifications approach. He asserts that the significance of uses and gratifications has constantly been revived. Also it has always provided a cutting-edge theoretical approach in the initial stages of each new mass communications medium: newspapers, radio and television, and now the Internet.

Williams, Rana&Dwivedi, Y. K. (2015) pointed self-efficacy, attitude and trust are another limitations of the UTAUT model. Venkatesh, Morris, Davis and Davis(2003) did not include self-efficacy as a direct determinant of behavioral intention in the UTAUT model, and it is considered as an indirect construct, measuring a specific self-efficacy, not an overall computer self-efficacy toward a particular technology (Straub, 2009). Inexperienced users view new technology (IT innovation) as complex, and the confidence in one's ability to handle them has a significant influence on their acceptance (Yuen,2010). A higher level of self-efficacy will lead to higher intentions to adopt and use innovation.

Another limitation of Unified Theory of Acceptance and Use of Technology model is its inflexibility to adapt to different contexts. As Gahtani, Hubona and Wang (2007) reported in their research about information technology acceptance in Saudi Arabia, which is a Middle-Easterncountry, cultural difference of Saudi Arabia from that of a typical western country became an obstacle for them to use UTAUT to analyze worker's adoption of computers in Saudi Arabia. Workers in Saudi Arabia had different work-related values from that of workers in western countries. According to their findings,Arab cultural beliefs formed resistance to accepting information technology, this difference had negatively interacted with social influence and hence exerted negative influence on workers' acceptance of IT in Saudia Arabia.For Benbasat and Barki (2007) UTAUT model is just a reincarnation of the Theory of Reasoned Action and Theory of Planned Behavior models and nothing more.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Introduction

This chapter focuses on the method of data collection as well as the analysis of the data. It presents the research method, the study area, and the population, sampling procedure, the sample, the research instrument, validity and reliability of the research instrument and the procedure for data analysis.

3.2. Research Method

The study employed the survey method. Bello and Ajayi (2000) noted that survey is a useful concept adopted when handling a large population, especially on issues that involves systemic collection of data with the use of questionnaire.

Survey method is widely adopted and used in communication research.It is useful in studying behavior and characteristics of a large audience population which at the end gives room for description (Defleur and Dennis 1996; Babbie, 2005).

Baxter and Babbie (2001) argue that in a quantitative oriented communication research, researchers often operationalize variables by asking structured questions.The survey method is justified in this study because it is a method suitable for gathering information from a large number of respondents on the given issue.Survey is also justifiable because the study is descriptive in nature. The study gives a descriptive account or situational analysis on usage of ICTs by the academic staff of A.B.U. The anonymity of survey method is another reason for adopting it, because it allows respondents to answer with candid as their identityremain covered.

3.3. The Study Area

The study was conducted inAhmadu Bello University Zaria, in Kaduna North West Nigeria. The school is one of the federal government first generation universities in the country that has been in existence for 54years now, precisely since 1962. Ahmadu Bello University is an international school with international staff and students. As at 2015/2016 academic session A.B.U Zaria has twelve faculties in two different campuses located atKongo in Zaria local government and Samaru in SabonGari local government area. The faculty of Administration has an academic staff strength of 131; Agriculture, 132; Arts, 129; Education, 150; Engineering, 221; Environmental design, 191; Human medicine, 303; Pharmaceutical Sciences, 107; Sciences, 316; Social sciences, 117; Veterinary medicine, 121; and faculty of Law, 51. The university covers a landarea of over 7000 hectares with a temperature that ranges from 26°C to 35°C. According to management the institution has a population of over 40,000 students comprising undergraduate and post graduate as at the last convocation held 2016.

3.4. The Study Population

The research population of this study comprises the academic staff of the twelve faculties of Ahmadu Bello University, whose ages range from 26-70 years old. According to the school management, as at November 2015, there are 1,969 academic staff in the whole 12 faculties put together. See attached appendix 1.

3.5. The Sampling Technique

The researcher used stratified random sampling method to draw the study sample. The stratified random sampling technique is one of the probability sampling designs that accords unit of the study population an equal chance of being included in the sample in a single draw from the population. A population sample requires the population to be divided into small groups called stratum (Chava& David, 1996;Ogbuoshi, 2006). As such, the researcher considered each of the twelve faculties in A.B.U Zaria as astratum.According to Osuala (2005) where the population constitutes different groups or subsets, the stratified sampling method should be considered. In addition, the appropriateness of this probability sampling is that it ensures that respondents have equal chances of being selected.

However, having understood variation in population size of each stratum, the researcher introduced percentage and proportion in order to be fair to all stratum. For example to get the percentage,Faculty of Administration with population of 130 was divided by the total of the whole population in the sample frame and multiplied by 100. i.e. 130÷1969×100=7%. To get the proportion of 7% out 330 questionnaire the researcher divided 7 by 100 and multiplied by 330. i.e. 7÷100×330=23. Therefore, 23 is the number of respondents picked from the Faculty of Administration. See attached appendix II

After taking the proportion of each faculty or stratum, the researcher went ahead to ballot out respondents in every stratum relying on their details provided on the sample frame. For example, in picking 23 respondents from the Faculty of Administration the researcher wrote name, rank, gender and department of each member under the stratum in a separate paper and then randomly picked 23 from it. This has aided the researcher to identify and locate every respondent picked for administration of questionnaire.

3.6. The Sample Size

Sample sizes were drawn on the basis of so many factors, some of which are project type, project purpose, project complexity, financial constraint and amount of error tolerated (Wimmer and Dominick 2006). To know the adequate size of the sample, researchers need to determine the level of accuracy expected from their estimates; that is, how large a standard error is acceptable

(Chavaand David 1996). The researcher arrived at 322 as the sample size taken from the population of 1,969. To arrive at 322 as sample size such was calculated using 95% as the confidence level and 5% as the margin of error. This was carried out using an online software on survey monkey’s website. See attached appendixIII. However, the researcher used 330 samples based on the arguments of Wimmer and Dominick (2006) that the larger the sample size, the more representative it is to the entire population.The three hundred and thirty (330) respondents were drawn from the 12 faculties in theAhmadu Bello University, Zaria.

3.7. Research Instrument

Three hundred and thirty copies of questionnaire were administered to lecturers in the 12 twelve faculties of theAhmadu Bello University, Zaria.

The questionnaire comprised three sections as follows:-

The first section comprised demographic data such as age, sex, rank, faculty department and year of work in the university.

The second section comprised of questions on awareness, access and usage of basic computer applications and academic e-resources by lecturers.

In the third section, questions were centered on what academic staff feel the challenges or problems are encountered when using ICTs. This was done using a five-point Likert scale.

There are six (6) questions under section one, sixteen (16) under section two and eight (8) questions under section three. All in all there thirty (30) questions on the instrument.

The researcher decided to use questionnaire as an instrument because of the characteristic and nature of the respondents work. Since the respondents are learned and might not have time for to grant interview, questionnaire in this case has been the simplest means gathering data from such respondents.

3.8. Validity and Reliability

To ensure the validity and reliability of the data collected, research experts vetted the questionnaire byensuring the clarity of the instructions to the respondents, proper wording of the items and their appropriateness for the study. The observations, criticisms, comments and recommendations of the evaluators were used to modify the instrument in order to properly suit the objectives of the study, after which apilot study was conducted at the NAERLs headquarters. Accordingly, thirtycopies of the questionnaire (10%) were administered to the academic staff to pretest and validate the reliability of the instrument. According to Bordens& Abbott (2002), a pilot study can help you clarify instructions, determine appropriate levels of independent variables, determine the reliability and validity of your observational method and also give you a practice in conducting your study so as to minimize the mistakes and errors when you do the real one.

3.9. Method of Data Analysis and Presentation

The descriptive and inferential data analysis technique was used to analyze the data for the study. This provides the basis for the interpretation and explanation of the content of the data. Ogbuoshi (2006) note that the descriptive data analysis is used for descriptive studies which involve the use of questionnaire andthe data obtained can be summarized in clear and simple terms. The essence of this to give room for both the quantitative and qualitative techniques to be used together. A statistical software called statistical package for social sciences popularly known as (SPSS) version 22 was used in analyzing the extracted data from the returned questionnaire.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1. Introduction

This chapter presents the data analysis, interpretation, as well as the discussion of findings. A total of 330 copies of the questionnaire were administered in the 12faculties of the Ahmadu Bello University, Zaria. However, out of the 330 copies of the questionnaire administered, only 325copies were retrieved and analyzed. A full-scale analysis of the retrieved and valid questionnaire showed response rate for this study at 98.48%, while theconfidence level for the test was greater than 80%. This analysis was carried out in an online software under Wal Warwick Donor digital's website under response significance calculator. See attached appendixIV.

4.2.Data Presentation

This part of the work processed and analysed the data resulting from the study using descriptive and inferential statistics, and the findings were presented in figures and tables. There are three segments in this section of the study. The first presents results and analysis ofrespondent's demographic data such as age, gender, rank and faculty, while the second part is on the usage of various computer applications, academic e-resources and the challenges of adoption and usage.

Table 4.1.Demographic Characteristics of the Respondents

Category		Frequency	Percentage (%)
Age	21-30 years	33	10.1
	31-40 years	155	47.9
	41-50 years	55	16.9
	51-60 years	66	20.2
	61-70 years	16	4.9
	Total	**325**	**100**
Gender	Male	236	72.7
	Female	89	27.3
	Total	**325**	**100**
Rank	Graduate Assistant	13	4.0
	Assistant Lecturer	37	11.3
	Lecturer II	69	21.2
	Lecturer I	74	22.7
	Senior Lecturer	52	16.0
	Reader	32	9.8
	Professor	48	15.0
	Total	**325**	**100**
Faculty	Medicine	49	15.1
	Engineering	36	11.1
	Veterinary	20	6.2
	Agriculture	23	7.0
	Arts	20	6.2
	Law	10	3.1
	Social Sciences	19	5.8
	Administration	23	7.0
	Education	24	7.5
	Environmental Design	33	10.1
	Pharmacy	17	5.1
	Sciences	51	15.8
	Total	**325**	**100**

The demographic data of the respondents is presented in table 4.1. The ages of the respondents showedthat (10.1%) of them fall between 21-30 years,(47.9%) respondents fall within 31-40 years, (16.9%) are within41-50 years, (20.2%) fall within51-60 years respectively, while the least record of the respondents, in terms ofage fall between 61-70 years representing(4.9%) of the total population. However, majority of the respondents (47.9%) are between the agescategories of 31-40 years. This showed that most of the lecturers are in their active age, meaning that they are still young and energetic, full of vigor, and can easily adopt and use of ICTs in the discharge of their academic duties.

Table 4.1 also revealed that the majority of the academic staff are male (72.7%), while the femalerespondents represent(27.3%) of the total population. This fairly reflects the proportion or ratio of male and female in the sample frame of this study.From the analysis shown on the aforementioned table, the majority of the respondents are on the academic cadre of Lecturer I (22.7%);those in the rank of Lecturer II with (21.2%) closely follow this. The respondents on the academic cadre of Senior lecturers, from the demographic data are (16.0%) and is being closely followed by therespondents on Professor Cadre (15.0%). However, the respondents on the level of Graduate assistants are the least with only (4.0%). This is evident even from the sample frame, that graduate assistant are the least academic staff in A.B.U in terms of number.

From the data in table 4.1, it was revealed thatFaculty of Human Medicine and Faculty of Science had majority of respondents with (15.1%) and (15.8%) respectively. TheFaculty of Engineering closely follows this with (11.1%) respondents who featured in the study. TheFaculty of Environmental Design recorded (10.1%), while Education had (7.5%) respondents in the study. The faculties of Agriculture (7.0%), Arts (6.2) and Administration had(7.0%) respondents. The Faculty of Veterinary Medicine recorded (6.1%)respondents while the Law had(3.1%)of the total respondents.

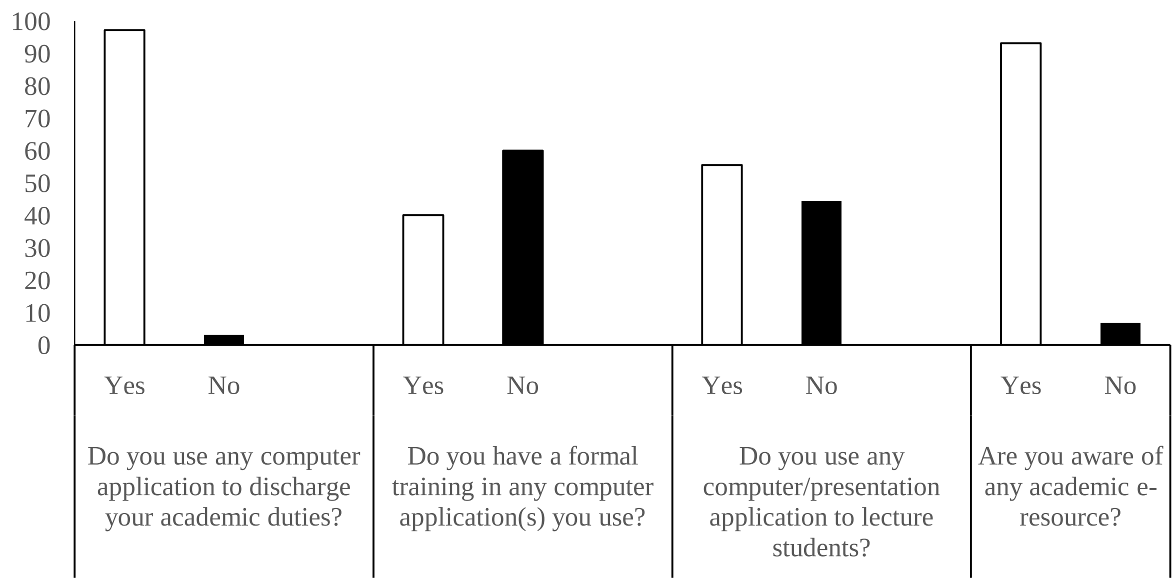

Figure 4.1: Usage and Awareness of computer applications and academic e-resources

Results of the analysis in the above figure 4.1 was presented using percentage on the Y-axis. It revealedthat themajority of the respondents (97.2%) use different computer application(s) in one way or the other to discharge their academic duties. However, only (3.1%)do not usecomputer application(s)whendischarging their duties in the academia. The(60.0%) of the respondents do not have a formal training in most of the computer applications. Thus, respondentsacquire knowledge of operating computer applications by practice on their own andout of curiosity, while onthe other hand,(40.0%) of the respondents had formal training in most computer applications they use in the academia.

The figure above also reveals that (55.5%) of the respondents use PowerPoint and other computer applications packages to lecture students. The respondents (44.5%) who do not use any of the computer application or other computer packages to lecture students, thereasons for not using any application are: facilities not available, lack of skills and knowledge of the applications, the issue of techno-phobia, smart boards not connected.While some stated their reasons that courses are better taught using white board and marker. For others, inconsistency in power supply are among other reasons for not using any computer presentation applications to deliver lectures.The results in figure 4.1 also revealed that there was a high-level of awareness of academic e-resource among the respondents. Virtually all academic staff in Ahmadu Bello University know about academic e-resources.

Table 4.2: Usage of various computer applications

	Usage (%)	Non Usage (%)
Microsoft word	299 (92.0)	26 (8.0)
Excel	260 (80.0)	65 (20.0)
Adobe reader	235 (72.3)	90 (27.7)
Power point	190 (58.5)	135 (41.5)
SPSS	165 (50.8)	160 (49.2)
Corel draw	78 (23.9)	247 (75.8)
STAT	45 (13.8)	280 (86.2)
MATLAB	34 (13.5)	281 (86.5)
EFI INFO	42 (12.9)	283 (87.1)
SAS	41(12.6)	284 (87.4)
Graph pad	39 (12.0)	286 (88.0)
1 Checker	17 (5.2)	308 (94.5)
Turnitin	13 (4.0)	312 (96.0)

Results of the analysis in table 4.2 above shows the distribution of respondents according to their usage of various computer applications.The results showed that the majorityof the respondents use basically five computer applications only, and this may cut across all the faculties. The majority of the respondents with (92.0%) use the Microsoft word. The respondents with (58.5%) also use PowerPoint application. Moreover, (80.0%) of the respondents use Excel software to discharge their academic duties, while(72.3%) of the respondents adopt and use Adobe reader for duty discharge andSPSS computer application has (50.8%) of the respondents as usage rate.The study also noted that only few respondents use other computer applications such as CorelDraw, Turnitin, SAS, Matlab, and Graph Pad, among other computer applications to discharge their academic dutiesAhmadu Bello University. The usage of only five computer applications by majority of the lecturers shows that the applications are being used in all the faculties of the school.

Table 4.3: Frequency of usage of computer applications

	Daily (Working days) No (%)	Weekly No (%)	Monthly No (%)	Yearly No (%)	Only when need arises No (%)	Not at all No (%)
MS word	239 (73.5)	42 (12.9)	16 (4.9)	3 (0.9)	11 (3.4)	14 (4.3)
Excel	83 (25.5)	82 (25.2)	53 (16.3)	21 (6.5)	44 (13.5)	42 (12.9)
Power point	61 (18.8)	104 (32.0)	57 (17.5)	22 (6.8)	50 (15.4)	31 (9.5)
SPSS	8 (2.5)	23 (7.1)	49 (15.1)	31 (9.1)	61 (18.8)	153 (47.1)
SAS	4 (1.2)	1 (0.3)	9 (2.8)	8 (2.5)	17 (5.2)	286 (88.0)
Adobe reader	123 (37.8)	61 (18.8)	34 (10.5)	7 (2.2)	20 (6.2)	80 (24.6)
1 Checker	2 (0.6)	1 (0.3)	1 (0.3)	1 (0.3)	11 (3.4)	309 (95.1)
CorelDraw	7 (2.2)	9 (2.8)	17 (5.2)	11 (3.4)	30 (9.2)	251 (77.2)
Graphpad	3 (0.9)	5 (1.5)	10 (3.1)	8 (2.5)	15 (4.6)	284 (87.4)
MATLAB	8 (2.5)	7 (2.2)	11 (3.4)	5 (1.5)	16 (4.9)	278 (85.5)
Turnitin	2 (0.6)	1 (0.3)	3 (0.9)	4 (1.2)	8 (2.5)	307 (94.5)
EPI INFO	3 (0.9)	4 (1.2)	11 (3.4)	10 (3.1)	12 (3.7)	285 (87.7)
STAT	7 (2.2)	8 (2.5)	7 (2.2)	10 (3.1)	22 (6.8)	271 (83.4)
Style writer	1 (0.3)	1 (0.3)	3 (0.9)	1 (0.3)	8 (2.5)	311 (95.7)

Results of the analysis in table 4.3 show how frequently respondents use various computer applications in the discharge of their academic duties. From the result, daily usage of computer applications has revealed that the majority of the respondents use Microsoft word on a daily basis with (73.5%). Adobe reader recorded(37.8%) of the respondentsusing it on a daily basis. The (25.5%) of the respondents use Excel application while (18.8%) of the respondents use PowerPoint daily. As revealed in table 4.3,Microsoft word, Excel, PowerPoint, SPSS and Adobe reader are the five major computer applications patronized and used mostly by the majority of the respondents.

Result of the weekly usage of computer applications by the respondents show that PowerPoint with(32.0%) is the most frequently used application followed by Excel (25.2%), and Adobe (18.8%) respectively. However, the least used computer applications under weekly usage by the respondents stood out to be SAS with(0.3%)of the respondents, 1checker (0.3%), Turnitin(0.3%) and Style writer (0.3%) respectively.

For monthly usage of computer applications, the most frequent and least used computer applications by the respondents were PowerPoint (17.5%) and 1checker (0.3%). Yearly usage varied from (0.3%) style writer and (0.3%) 1checker as the least used computer applications. SPSS with (9.1%) is the most frequently used computer application by the majority of the respondents under yearly usage category.

Forusage only when the need arises, the least used computer application turned out to be style writer (2.5%) and turnitin(2.5%), while the most frequently used application only when the need arises was SPSS with(18.8%). It was found that the respondents do not use some basic computer applications. The proportion that do not use Microsoft word,Excel, PowerPoint,Adobe reader, and SPSS application are respectively(4.3%),(12.9%),(9.5%),(24.6%),and(47.1%).

Table 4.4: Respondents' level of experience with various computer applications

	Poor (%)	Average (%)	Good (%)	V. Good (%)	Excellent (%)
MS word	14 (4.3)	33 (10.1)	95 (29.2)	108 (33.3)	75 (23.1)
Excel	42 (12.9)	51 (15.7)	107 (32.9)	85 (26.2)	42 (12.3)
Power point	31 (9.5)	36 (11.1)	96 (29.5)	101 (31.1)	61 (18.8)
SPSS	153 (47.1)	66 (20.3)	64 (19.7)	33 (10.2)	9 (2.8)
SAS	277 (85.2)	8 (2.5)	21 (6.5)	15 (4.6)	4 (1.2)
Adobe reader	88 (27.1)	25 (7.7)	84 (25.8)	82 (25.2)	46 (14.2)
1 Checker	307 (94.5)	9 (2.8)	3 (0.9)	5 (1.5)	1 (0.3)
CorelDraw	248 (76.5)	35 (10.8)	25 (7.7)	10 (3.1)	6 (1.9)
Graphpad	284 (87.4)	16 (4.9)	14 (4.3)	9 (2.8)	2 (0.6)
MATLAB	276 (84.9)	23 (7.1)	15 (4.6)	6 (1.8)	5 (1.5)
Turnitin	309 (95.1)	6 (1.8)	6 (1.8)	4 (1.2)	0 (0.0)
EPI INFO	284 (87.4)	15 (4.6)	20 (6.2)	6 (1.8)	0 (0.0)
STAT	270 (83.1)	26 (8.0)	18 (5.5)	11 (3.4)	0 (0.0)
Style writer	311 (95.8)	6 (1.8)	4 (1.2)	4 (1.2)	0 (0.0)

Results of the analysis represented in table 4.4 show the level of experience possessed by the respondents in utilizing various computer applications. The(4.3%) of the respondents have poor experience using Microsoft word. Thisby implication, they are not literate enough to use the application. Also (10.2%) of the respondents have an average experience, while the(29.2%) of the respondents have a good experience, the(33.3%) of the respondents, that is the majority, have very good experience,and while(23.1%) have excellent experience when it comes to using Microsoft word application. The(12.9%) of the respondents have poor experience in using Excel application,the (15.7%)haveaverage, the(32.9%)are good, (26.2%)very good,while (12.3%) of the respondents are excellent in using excel application when it comes to duty discharge. Respondents with (9.5%) had poor experience using PowerPoint, the(11.1%) are averagely knowledgeable using the PowerPoint application, and (29.5%) and (31.1%) of the respondents are good and very good respectively while (18.8%)are excellent. the(47.1%) of the respondents have experience with SPPS, while(20.3%) are average, (19.7%) are good, (10.2%) are very good and while (2.8%) of the respondents had excellent experience using SPSS computer application. Adobe Reader computer application is also used by the respondents as the(27.1%) of them have poor knowledge of the application, (7.7%)are average, (25.8%)aregood,(25.2%)records very good and (14.2%) of therespondents records excellent knowledge and experience of Adobe Reader computer application. However, from Table 4.4, it was deduced that the majority of the respondents have poor experience and knowledge of other computer applications. This shows some levels or trends existing in usage, and experience of the respondents, as shown in tables4.2, 4.3 and 4.4. The majority of the respondents seem to tilt towards only five computer applications: Microsoft word, Excel, PowerPoint, Adobe reader and SPSS respectively.

Table 4.5: Extent to which ICT improve the discharge of academic duties

	Frequency	Percentage
Not at all	6	1.8
Little	18	5.5
Moderately	54	16.6
Very much	247	76.0
Total	**325**	**100**

The results of the analysis presented in table 4.5 above show that the majority of the respondents in the study strongly agree that ICTs helps improve the discharge of academic duties, with 76.0% of the respondents. 16.0% of the respondents agreed that ICTs assists, but in a moderate form when discharging their academic duties, while 5.5% of the respondents indicated that ICT offers just little assistance in the academia. However, 1.8% of the respondents disagreed that ICTs do not help when it comes to duty discharge.

Table 4.6: How respondents access internet from their offices

Platform	Frequency	Percentage
University provided	82	25.2
Personal modem	55	17.0
GSM data subscription	44	13.5
All of the above	144	44.3

Analysis of data recorded in table 4.6 above shows that the respondents do not rely on a single source to access the internet. The majority of the respondents(44.3%) use all the sources of internet access mentioned in the table such as personal modem, GSM data subscription and the university ICT. This, by implication, shows that the university provided internet access alone is not sufficient to service their internet need. The(13.5%) of the respondents use only their GSM data subscription to access the net, (17.0%) use Personal modem, while (25.2%) use the university provided to have access to the internet.

Table 4.7: Preferred channel(s) of communication between lecturers and students via the internet

Channels	Used (%)	Not used (%)
Email	203 (62.5)	122 (37.5)
LinkedIn	26 (8.0)	299 (92.0)
Google plus	17 (5.2)	308 (94.8)
Researchgate	27 (8.3)	298 (91.7)
Skype	13 (4.0)	312 (96.0)
None of the Above	122 (34.5)	213 (65.5)

Results of the analysis represented in table 4.7 show thatthe most common media of communication used by the majority of the respondents via the internet to communicate with students is email,with 62.5%of the respondents. Only 8.0% of the respondents useLinkedIn to communicate, 5.2% use Google plus medium, 8.3% use Research gate and 4.0% of the respondents use Skype as the media of communication with students. However,34.5% of the respondents do not take advantage of using the internet facilitate or enhance any form of communication with their students, as they do not use any of the channels provided.Nweze and Chenwe(2010) also found in their study at the Obafemi Awolowo University that the majority of the lecturers use email mainly when it comes to internet communication.Ojedukun and Owolabi (2003) found email to be the common and easiest form of communication among academics in Botswana. Perhaps, we can say e-mail communication is easier and simple, as it does not require too much technicality, compared to other media of communication in the internet.

Table 4.8: How respondents get to know about academic e-resources.

Sources	Frequency	Percentage
Colleagues	109	36.1%
Internet	103	34.0%
Training/Workshop	80	26.5%
Interaction with students	7	2.3%
Media	5	1.7%

The results of the analysis presented in table 4.8 above suggests that interpersonal channels are the most frequently mentioned source of knowledge about academic e-resourceswith colleagues having 36.1% of the respondents which is the majority. The 26.5% of the respondents became knowledgeable about e-resources platforms via training and workshops, 2.3% as result of interaction with students. However, 34.0% of the respondents had their knowledge of academic e-resources through an intrapersonal means which the internet, while 1.7% of the respondents through the media.As revealed by Madhusudhan (2008) and Talhami (2009) in their studies that the majority of academics with 90% at the King Faisal Abdulaziz University and Islamic University of Saudi Arabia, agreed to know much about electronic database resources (e-resources platforms).Nweze and Chenwe(2010) in their study also corroborated the findings of this study,that irrespective of where the knowledge comes, most lecturers may be aware of academic e-resources platforms.

Table 4.9: Academic e-resources accessed and used by the respondents

E-resources	Accessed & used (%)	Un accessed & Un used (%)
Hinari	113 (34.8)	212 (65.2)
ARDI	52 (16.0)	273 (84.0)
AJOL	114 (35.1)	211 (64.9)
PubMed	116 (51.1)	209 (48.9)
Wikiversity	51 (15.7)	274 (84.3)
AGORA	93 (28.6)	232 (71.4)
Research gate	96 (29.5)	229 (70.5)
Bio One	134 (41.2)	191 (58.8)
Popline	22 (6.8)	303 (93.2)
Science direct	186 (57.2)	139 (42.8)
Jstor	127 (39.1)	198 (60.9)
DOAJ	109 (33.5)	216 (66.5)
OARE	80 (24.6)	245 (75.4)
Questia	49 (15.1)	276 (84.9)
Wiley Interscience	42 (12.9)	283 (87.1)
Google Scholar	190 (58.5)	135 (41.5)

The results of the analysis presented in table 4.9 above shows access and usage of different academic e-resource platforms by therespondents.Majority of the respondents with 58.5% useGoogle scholar, while 57.2% of the respondents use Science direct as the second most used academic e-resources by the respondents. Also, 51.1% of the respondents use PubMed for academic research. The 35.1% of the respondents useAJOL, while 34.8% use Hinari and 39.1% of respondents use Jstore respectively. The least used academic e-resources by the respondents are Popline 6.8%, ARDI 16.0%, Research Gate 29.5% and OARE 24.6% of the respondents. We can deduct from the table that the majority of the respondents who use academic e-resources prefer to use Science direct, Google Scholar,Jstore, Bio one, DOAJ, PubMed,AJOL and Hinari than other academic e-resources. It has been observed that ABU pays annually for subscription to some of the academic e-resources platforms.

Table 4.10: Frequency of usage of academic e-resources

E-resources	Never (%)	Seldom (%)	Sometimes(%)	Often (%)	Always (%)
HINARI	212 (65.2)	20 (6.1)	50 (15.4)	27 (8.3)	16 (4.9)
ARDI	273 (84.0)	9 (2.9)	17 (5.3)	11 (3.4)	14 (4.4)
AJOL	211 (64.9)	16 (4.9)	45 (13.9)	40 (12.3)	13 (4.0)
PubMed	209 (48.9)	54 (16.6)	29 (8.9)	18 (5.5)	15 (4.6)
Wikiversity	274 (84.3)	18 (5.5)	14 (4.3)	8 (2.5)	11 (3.4)
AGORA	232 (71.4)	20 (6.1)	28 (8.6)	36 (11.1)	9 (2.8)
ResearchGate	229 (70.5)	19 (5.8)	25 (7.7)	22 (6.8)	30 (9.2)
Bio One	191 (58.8)	40 (12.3)	30 (9.2)	30 (9.2)	34 (10.5)
Popline	303 (93.2)	8 (2.5)	6 (1.8)	5 (1.5)	3 (0.9)
Science direct	139 (42.8)	46 (14.2)	57 (17.5)	41 (12.6)	42 (12.9)
Jstor	198 (60.9)	49 (15.1)	35 (10.8)	28 (8.6)	15 (4.6)
DOAJ	216 (66.5)	50 (15.4)	23(7.1)	20 (6.1)	16 (4.9)
OARE	245 (75.4)	35 (10.8)	15 (4.6)	18 (5.5)	12(3.7)
Questia	276 (84.9)	11 (3.4)	17 (5.2)	11 (3.4)	10 (3.1)
Wiley Intersci	283 (87.1)	11 (3.4)	11 (3.4)	13 (4.0)	7 (2.1)
Google Scholar	135 (41.5)	11 (3.4)	38 (11.7)	61(18.8)	80 (24.6)

The results of the analysis presented in the table 4.10 above shows statistics of frequency of access and usage of various academic e-resources platforms by the respondents. A reasonable portion of the respondents always visit and use Google Scholar e-resources platform with 24.6%,18.8% of the respondentsoftenly use it, 11.7% do sometimes make use of Google Scholar e-resources. However, 41.5% of the respondents do not consult oruse Google scholar academic e-resource for research or knowledge update. Thisis greater than all frequencies of those using other platforms. Science direct has 12.9% of the respondents, who always refer to it for knowledge. Respondents who often access and make use of it stood at 12.6%, less than those using it always. However, just like Google Scholar, respondents who never visit or consider using Science direct platform are higher than respondents who use it, with 42.8%.In addition, Bio One has 10.5% of always usage by the respondents while Research gate has 9.2% of the respondents accessing and using it on daily basis.Popline with 0.9% Wiley Interscience with 2.1%, Agora with 2.8% Questia with 3.1%,Wikiversity with 3.4% and OARE with 3.7% usage, are among the least accessed and used academice-resources platforms by the respondents in the category of always usage.Under the category of Seldom access and use of e-resources, PubMedwith 16.6% of the respondents and JSTORE with 15.1% of the respondents who access and use them, tops the category while,Popline and ARDI with 2.5% and 2.9% respectively are the least accessed and used e-resources under the Seldom category.However, contrary to the frequency of usage, a larger percentage of the respondents have never accessed and used any academic e-resources platform, as the never category revealed. Data in table 4.11 under challenges have revealed reasons why the majority of the respondents never take time to use academic e-resources platforms for research or personal development.

In an effort to analyze data obtained in respect ofresearch question 3 which focused on challenges, a five points likertscale format was used with strongly agree, disagree, neutral, agree, and strongly agree as measurement scale responses. In collapsing likerts responses DeVellis (2003) recommended that strongly agree and agree be collapsed together while, strongly disagree, disagree and neutral be also collapsed together to form agree and disagree only. The responses collected from this studywere recorded such that agree and strongly agree became agree and coded as two (2), while strongly disagree, disagree and neutral were collapsed together to form disagree and coded as one (1). To get the reference mean value, the responses were added together, thus (2+1=3/2=1.5). Therefore, a mean response higher than 1.5 signifies agreement while lower than 1.5 signifies disagreement.

Table 4.11: ICT challenges faced by academics in A.B.U

s/n	Opinions	Agree (%)	Disagree (%)	Mean
1	Level of ICT skills possessed by academic staff	254 (78.2)	71 (21.8)	1.78
2	Training and workshop on ICTs	252 (77.5)	73 (22.5)	1.77
3	Poor network connectivity	224 (68.9)	101 (31.1)	1.69
4	Inadequate man power	170 (52.3)	155 (47.7)	1.52
5	Poor nature of power supply	167 (51.4)	158 (48.6)	1.51
6	Interest on ICTs	163 (50.2)	162 (49.8)	1.50
7	Low level awareness creation	160 (49.2)	165 (50.8)	1.49
8	Poor time schedule	154 (47.4)	171 (52.6)	1.47

Analysis of data in the table 4.11 above present thechallenges lecturers in Ahmadu Bello University are facing in relation to access andutilization of ICTs. The challenges arranged in descending order shows that the biggest ICT problem of ABU lecturers is ICT skills, majority of the respondents with 78.2% agreed that low ICT skills possessed by the academic staff negatively affects their utilization of computer to discharge duties, while 21.8% of the respondents disagreed. The mean 1.78 shows lack of ICT skills affects majority of the respondents when it comes utilizing computer and accessing the net to discharge their academic duties. The second biggest problem academic staff are facing when it comes adoption and utilization of information and communication technology is the issue of training and workshops. Large portion of the respondents with 77.5% agreed that the current stage of training and workshops on ICT are not adequate, while 22.5% of the respondents indicated that it is adequate. However, the mean score under this opinion stood at 1.77, which is above the reference mean, 1.5. We can conclude that the current trend of trainings and workshops on ICT in A.B.U are not enough to fill the gap in knowledge of ICT among the respondents. Inadequate training and workshop for the respondents has greatly affected the respondents' access and usage of academic e-resources as the majority could not go beyond Google scholar and Science direct, as revealed in table 4.9. In addition, lack of adequate training and workshop for the academic staff could also account for the reason why a larger percentage of the respondents could not explore computer applications beyond Microsoft word, Excel, Adobe reader, PowerPoint and SPSS respectively as indicated in table 4.2 and 4.3 respectively. Egberongbe (2011) found that the majority of lecturers at the University of Lagos are aware and use electronic resources platforms. This is because the majority of the lecturers have attended various workshops and training on accessing and utilizing academic e-resources platforms or database for academic delivery.

Another problem is that of internet connectivity, 68.9% of the respondents agree that there is problem of internet connectivity while 31.1% of the respondents shows disagreement. The mean 1.69 shows there is problem of poor internet connectivity in ABU, which also hinders access and utilization of academic e-resources by the academics of A.B.U. Expressing their opinion on inadequate man power, 52.3% of the respondents are in agreement that inadequate man power leads to excess work on the academics and as such they hardly get quality time to explore computer applications and even access academic e-resources, while 47.7% of the respondents show their disagreement. The mean 1.52 shows that inadequate man power is really an issue in ABU. Hence, lecturers find it difficult and challenging to have quality time to explore and use the various computer applications and access academic e-resources. On challenge related to power, 51.4% of the respondents agree that inconsistency in power supply is a problem to ABU lecturers as it affects their access to academic e-resources and utilization of computer for academic delivery, while 48.6% of the respondents disagree. The mean, 1.51 shows power outage is a problem in ABU and as such, it affects lecturers' utilization of computer and access to academic e-resources. Information and communication technologies rely heavily on constant and steady power supply to function effectively and so, also accessing academic e-resources. A good percentage of the respondents under figure 4.1 revealed that they do not use PowerPoint application to lecture students because of inconsistency in power supply. On interest and adoption and utilization of ICT in the academia, 50.2% of the respondents express their opinion in agreement that lack of interest is a factor that hinders adoption and utilization of ICTs in the discharge of academic duties, while 49.8% of the respondents disagree. The mean 1.50 shows that lack of interest is a factor that deter adoption and utilization of ICTs among ABU lecturers. With this, we can say that if the respondents were to be interested in exploring the advantages various ICTs applications offer, they would have gone an extra mile on their own to acquire knowledge and skills of different applications related to their disciplines, and apply such knowledge to duty discharge via ICTs.

However, the issue of awareness creation in the university by the management regarding the availability and subscription to academic e-resources for the consumption of the lecturers and poor time schedule are not regarded among major challenges that exist among A.B.U lecturers when it comes to adoption and utilization of ICTs and e-resources for academic delivery.

Table 4.12: Respondents'usage of computer applications according togender

SEX	Usage (%)	Non Usage (%)
Male	229 (99.1)	2 (0.9)
Female	86 (91.5)	8 (8.5)

x^2= 3.665, df = 1, p= 0.056

Data in the table 4.12 above reveal that there is sex variation when it comes to usage of computer by the respondents. Male respondents had higher frequency (229) computer application usage than their female counter parts (86) in spite of the ease computer brought. A chi square test of gender and usage of computer application among A.B.U lecturers shows that there is no relationship between gender and computer application usage among A.B.U academics.

Table 4.13:Respondents' usage of computer applications according to age.

AGE CATEGORY	Usage (%)	Non Usage (%)
21-30	33 (100)	0 (0.0)
31-40	156 (100)	0 (0.0)
41-50	53 (98.1)	1 (1.9)
51-60	62 (92.5)	5 (7.5)
61-70	12 (75.0)	4 (25.0)

x^2= 33.822, df = 4, p= 0.001

Data in the table 4.13 above shows a cross tabulation of the respondents according to their age category, in relations to use of computer application(s) in discharging academic duties. The cross tabulation shows a trend in usage of computer application as (100%) of the respondents between the ages of 21-30 and 31-40 use computer application(s).However, only(75%) of the respondents between the ages barrack of 61-70 use computer application when it comes to discharging academic duties. We can deduce that age plays a role in accepting and utilizing computer by individuals as postulated by propounders of UTAUT. A chi square test shows there is exist a significant relationship between age and usage of computer application(s) among A.B.U lecturers.

Table 4.14:Access and Utilization of Academic e-resources by Faculty

Faculty	Hinari(%)		ARDI(%)		AJOL(%)		PubMed(%)	
	Usage	Non usage	Usage	Non usage	Usage	Non usage	Usage	Non usage
Medicine	43(86.0)	7(14.0)	4 (8.0)	46 (92.0)	32 (64.0)	18 (36.0)	44 (88.0)	6 (12.0)
Engineering	6 (16.2)	31 (83.8)	12(32.4)	25 (67.6)	7 (18.9)	30 (81.1)	1(2.7)	36(97.3)
Veterinary	14(70.0)	6(30.0)	1 (5.0)	19 (95.0)	14 (70.0)	6 (30.0)	16 (80.0)	4 (20.0)
Agriculture	9(40.9)	13 (50.0)	4 (18.2)	18 (81.8)	14 (63.6)	8 (36.4)	10 (45.5)	12 (54.5)
Arts	0 (0.0)	22 (100)	1 (4.5)	21 (95.5)	3 (13.6)	19 (86.4)	0 (0.0)	22 (100)
Law	0 (0.0)	9 (100)	0 (0.0)	9 (100)	1(11.1)	8(88.9)	1 (11.1)	8 (88.9)
Social Sciences	0 (0.0)	19 (100)	0 (0.0)	19 (100)	3 (15.8)	16 (84.2)	0 (0.0)	19 (100)
Administration	2 (9.1)	20 (90.9)	0 (0.0)	22 (100)	3 (13.6)	19 (86.4)	0 (0.0)	22 (100)
Education	3 (13.0)	20 (87.0)	2 (8.7)	21 (91.3)	2(8.7)	21(91.3)	3 (13)	20 (87)
Envt. Design	1(3.1)	31(96.9)	7(21.9)	25(78.1)	4 (12.5)	28 (87.5)	0 (0.0)	32 (100)
Pharmacy	14(82.4)	4(17.6)	1 (5.6)	17 (94.4)	3 (16.7)	15 (83.3)	12 (66.7)	6 (33.3)
Science	21(41.2)	30(58.8)	20(39.2)	31(60.8)	28(54.9)	23 (45.1)	13 (25.5)	38 (74.5)

Faculty	Wikiversity(%)	Agora(%)	Research Gate(%)	Bio One(%)

Table 4.14:Continuation…

Faculty	Popline(%)		Science direct(%)		JSTORE(%)		DOAJ(%)	
	Usage	Non Usage	Usage	Non Usage	Usage	Non Usage	Usage	Non Usage
Medicine	4(8.0)	46(92.0)	25(50.0)	25(50.0)	28(56.0)	22(44.0)	30(60.0)	20(40.0)
Engineering	4 (10.8)	33 (89.2)	9(24.3)	28(75.7)	7 (18.9)	30(81.1)	19 (51.4)	18 (48.6)
Veterinary	4 (20.0)	16 (80.0)	9(45.0)	11(55.0)	12(60.0)	8(40.0)	14 (70.0)	6(30.0)
Agriculture	6 (27.3)	16 (72.7)	17(72.3)	5(27.7)	3 (13.6)	19 (86.4)	12 (54.5)	10 (45.5)
Arts	3 (13.6)	19 (86.4)	0 (0.0)	22 (100)	4 (18.2)	18 (81.8)	0 (0.0)	22 (100)
Law	0 (0.0)	9 (100)	0 (0.0)	9 (100)	0 (0.0)	9 (100)	0 (0.0)	9 (100)
Social Sciences	5 (26.3)	14 (73.7)	0 (0.0)	19 (100)	3(15.8)	16(84.2)	0 (0.0)	19 (100)
Administration	2 (9.1)	20 (90.9)	1 (4.5)	21 (95.5)	1 (4.5)	21 (95.5)	0 (0.0)	22 (100)
Education	8 (34.8)	15 (65.2)	3 (13.0)	20 (87.0)	4(12.1)	29(87.9)	0 (0.0)	23 (100)
Envt. Design	3 (9.4)	29 (90.6)	2 (6.2)	30 (93.8)	0 (0.0)	32 (100)	15 (46.9)	17 (53.1)
Pharmacy	4 (22.2)	14 (77.8)	5 (27.8)	13 (72.2)	8(44.4)	10(55.6)	8 (44.4)	10 (55.6)
Sciences	8 (15.7)	43 (84.3)	22 (43.1)	29 (56.9)	26(51.0)	25(49.0)	36 (70.6)	15 (29.4)

.

Faculty	OARE(%)		Questia(%)		Wiley Interscience(%)		Google Scholar(%)	
Medicine	14(28.0)	36(72.0)	38 (76.0)	12 (24.0)	13 (26.0)	37 (74.0)	15 (30.0)	35 (70.0)
Engineering	0 (0.0)	37 (100)	25 (67.6)	12 (32.4)	8 (21.6)	29 (78.4)	24(64.9)	13(35.1)
Veterinary	2(10.0)	18(90.0)	11 (55.0)	9(45.0)	8 (40.0)	12 (60.0)	3 (15.0)	17 (85.0)
Agriculture	1(4.5)	21(95.5)	15 (68.2)	7 (31.8)	12 (54.5)	10 (45.5)	7 (31.8)	15 (68.2)
Arts	0 (0.0)	22 (100)	8(36.4)	14(63.6)	10(45.5)	12(55.5)	10 (45.5)	12(54.5)
Law	0 (0.0)	9 (100)	4(44.4)	5(55.6)	2 (22.2)	7 (77.8)	0 (0.0)	9 (100)
Social Sciences	0 (0.0)	19 (100)	7 (36.8)	12 (63.8)	8(42.1)	11(57.9)	2 (10.5)	17(89.5)
Administration	0 (0.0)	22 (100)	11(50.0)	11(50.0)	5(22.7)	17(77.3)	2 (9.1)	20 (90.9)
Education	1 (4.3)	22 (95.7)	10(43.5)	13(56.5)	5 (21.7)	18 (78.3)	8(34.8)	15(65.2)
Envt. Design	0 (0.0)	32 (100)	12 (37.2)	20 (62.8)	13 (40.6)	19 (59.4)	1 (3.1)	31 (96.9)
Pharmacy	0 (0.0)	18 (100)	10(55.6)	8(44.4)	5 (27.8)	13 (72.2)	1 (5.6)	17 (94.4)
Science	4 (7.8)	47 (92.2)	35(68.6)	16(31.4)	38 (74.5)	13 (25.5)	36 (70.6)	15 (29.4)

Table 4.14:Continuation…

Table 4.14: Continuation….

	Usage	Non Usage	Usage	Non Usage	Usage	Non Usage	Usage	Non Usage
Medicine	6 (12.0)	44 (88.0)	5(10.0)	45(90.0)	1(2.0)	49 (98.0)	30(60.0)	20(40.0)
Engineering	19(51.4)	18(48.6)	5(13.5)	32(86.5)	10 (27.0)	27(73.0)	19 (51.4)	18 (48.6)
Veterinary	5 (25.0)	15 (75.0)	4(20.0)	16(80.0)	0(0.0)	20(1000)	10(50.0)	10(50.0)
Agriculture	12(54.5)	10(45.5)	3 (13.6)	19 (86.4)	3 (13.6)	19(86.4)	14 (63.6)	8 (36.4)
Arts	1 (4.5)	21 (95.5)	10 (45.6)	12 (54.4)	6(27.3)	16(72.7)	16 (72.7)	6 (27.3)
Law	2(22.2)	7(77.8)	1(11.1)	8(88.9)	3(33.3)	6(66.7)	4(44.8)	5(55.6)
Social Sciences	1(5.3)	18(94.7)	2 (10.5)	17(89.5)	1(5.3)	18(94.7)	11 (57.9)	8 (42.1)
Administration	1 (4.5)	21(95.5)	6(27.3)	16(72.7)	10 (45.6)	12 (54.4)	13(59.1)	9(40.9)
Education	0 (0.0)	23 (100)	6(26.0)	17(74.0)	1 (4.3)	22 (95.7)	15 (65.2)	8 (34.8)
Envt. Design	3(9.4)	29(90.6)	0(0.0)	32(00)	0 (0.0)	32 (100)	14 (43.8)	18 (56.3)
Pharmacy	0 (0.0)	18 (100)	2(11.1)	16(88.9)	1(5.5)	17(94.5)	10 (55.6)	8 (44.4)
Sciences	30(58.8)	21(41.2)	5 (9.8)	46 (90.2)	6 (11.8)	45 (88.2)	34 (66.7)	17 (33.3)

Data in the table 4.14 above reveals usage of academic e-resources according to faculties. It shows that majority of respondents from the faculty of Human medicine with (86.0%) useHinari, followed by the faculty of Pharmaceutical sciences with (82.4%) and faculty of Veterinary medicine (70.0%). The usage of Hinari by only respondents from the faculty of Human medicine, Pharmaceutical sciences and Veterinary medicine is not surprising because Hinari provides resources only in the field of health and other related areas.Few respondents from the faculty of Sciences with (41.2%) and the faculty of Engineering with (32.4%) use ARDI respectively. An acronym that stands for Access to Research for Development and Innovation and deals with applied science and technology.AJOL is mostly use by the majority of respondents from the faculty of Veterinary medicine with (70.0%), followed by Human medicine with (64.0%), Agriculture with (63.6%) and faculty of Sciences with (54.9%) respondents. However, faculty of Education with (8.7%), Law with (11.1%), Environmental design with (12.5%), Administration with (13.6%), Arts (13.6%) and Social sciences with (15.8%) have the least users of AJOL. AJOL stands for African Journals Online; it is an open access e-resource for virtually all disciplines. PubMedhas majority of it users from the faculty of Human medicine with (88.0%), Veterinary medicine with (80.0%) and faculty of Pharmaceutical sciences with (66.7%).Pubmed like Hinari deals specifically with resources related medicine, life sciences and biomedical. Therefore, the reason for its usage by majority of respondents from the three mentioned faculties above is not a surprise. Majority of the respondents from the faculty of Agriculture access and use AGORA with (72.3%) of the respondents, Human medicine with (50.0%), while few other respondents from the faculty of Pharmaceutical sciences with (27.8%) access and use the e-resources. Respondents from thefaculty of Veterinary medicine with (45.0%) and faculty of Sciences with (43.1%)respondents are also accessing and using AGORA. However, respondents from the faculty of Engineering with (24.3%), faculty of Environmental design (6.2%) and faculty of Social sciences with (0.0%)respondents are among the least users of AGORA e-resource. AGORA is an acronym that stands for Access to Global Research on Agriculture; it has peer-reviewed publications in Agriculture and other publications related toBiological Sciences, Environmental and Social Sciences. Research gate according to the table is majorly used by respondents from the faculty of Veterinary medicine with (60.0%)usage by the respondents; faculty of Human medicine has (56.0%), faculty of Science (51.0%) and faculty of Pharmaceutical sciences (44.4%)respondents' usage. However, theleast users of Research gate are respondents from the faculty of Law and of Environmental design both with (0.0%) usage, only (4.5%) respondents from the faculty of Administration access and use Research gate, (12.1%) respondents from the faculty of Education, (13.6%) faculty of Agriculture, (15.8%) faculty of Social science, while faculty of Arts and Engineering had (18.2%) and (18.9%) respondents' usage of Research gate e-resource. Research gate is also open to all disciplines like AJOL. For Bio One e-resources, majority of it users are from the faculty of Sciences with (70.6%) respondents, Veterinary medicine (70.0%) respondents, faculty of Agriculture has(54.5%) respondents and faculty of Engineering on other hand has(51.0%) respondents access and use Bio one. Bio One provides resources to specific disciplines that includes biological, ecological and environmental sciences. Science direct is another e-resource open to virtually all disciplines. Respondents from the faculty of Human medicine with (76.0%), are the highest users of Science direct e-resource, respondents from the faculty of Engineering with(55.0%) respondents also access and use Science direct, Agriculture (68.2%), Sciences (68.6%), Veterinary medicine (45.0%) respondents access and use e-resource from science direct. However, faculty of Arts with (36.4%), Education with (43.5%), Law with (44.4%) and faculty of Social science with (36.8%), Environmental design (37.2%) are among the least faculties in ABU that access and use e-resources via Science direct. It is also an all open access with academic resources virtually for all disciplines. Journal storage (JSTORE) is another academic e-resource that provides academic resources for more than 50 disciplines. The(74.5%) respondents from the faculty of Sciences are the most users of JSTORE in A.B.U, andfollowed by (54.5%) respondents from the faculty of Agriculture. While, the faculty of Engineering with (21.6%) respondents and Education with (21.7%) respondents are among the least that access and user JSTORE for academic resources.Also revealed from the table 4.14 above is access and the usage of academic resources from the directory of open access journals (DOAJ). The (70.6%) respondents from the faculty of Sciences are the highest users of DOAJ in A.B.U, faculty of Engineering with (64.9%)also consult and use DOAJ, faculty of Arts has (45.5%) respondents who access and use DOAJ, faculty of Education has(34.8%) of respondents access and use DOAJ. Directory of open access journals (DOAJ) is also among the multidisciplinary academic e-resource data base. The(59.1%) of the respondents from the faculty of Agriculture use e-resources from OARE, (58.8%) of the respondents from the faculty of Sciences also use OARE while (51.4%) of the respondents from the faculty of Engineering use it. OARE is an acronym of online access to research in the environment; it provides electronic academic resources to wide range of disciplines. The(45.6%0 respondents from the faculty of Arts use Questia, (26.0%) of the respondents from the faculty of Education use it, and (10.5%) of the respondents also the minority from the faculty of Social sciences access and use Questia. Questia is also an academic e-resource that provides academic materials solely for humanities, social sciences and other related disciplines in the academia. There is low consultation and usage of Wiley interscience academic e-resource among the academic staff of A.B.U. For instance, only (27.0%) of the respondents from the faculty of Engineering access and use Wiley interscience.(27.3%) of the respondents also not the majority from the faculty of Arts use it, faculty of Law has (33.3%) access and usage, Social sciences has (5.3%) while the faculty of Administration has (45.6%) of its respondents using Wiley interscience, a bit better than the rest of the faculties. Wiley interscience provides academic resources in the discipline of Law, Social sciences, Humanities, Management, Engineering and other related fields. Google scholar just like AJOL, OARE, Science direct, JSTORE, Research gate and DOAJ, provides academic resources to virtually all disciplines. Majority of lecturers in A.B.U are not left behind when it comes to accessing and utilizing academic e-resources from Google scholar, as data in table 4.11 revealed. (60.0%) of the respondents from the faculty of Human medicine use google scholar, (51.4%) from Engineering,(50.0%) from Veterinary medicine, (63.6%) from Agriculture, (72.7%) from Arts, (57.9%) Social sciences, (59.1%) Administration, (65.2%) Education, (55.6%) Pharmaceutical sciences, and(66.7%) of the respondents from the faculty of Sciences also use google scholar. However, respondents from the faculty of law with (44.8%) and faculty of Environmental design with (43.8%) are the least users of Google scholar among faculties in A.B.U Zaria.

4.3. Discussion of Findings

Three research questions guided the discussion of the findings of the study which is substantiated by some conceptual framework and findings of different scholars. From the demographic data,the majority of the respondents in the study fall in the age bracket of 31-40. According to Bar-Ilan, Peritz, and Wolman (2003), the most active users of ICTs and the electronic journals are the younger members of the teaching and research staff in the academia. Furthermore, male respondents are higher than their female counterparts in terms of population. This is observed even in the sample frame. The data, which is in line with the findings of Olaogun, Adebayo and Oluyemo (2015) in a survey researchof selected tertiary institutions in Nigeria, reveal that there is strong gender imbalance in the constitution of the faculty staff. The men, especially the lecturers clearly outnumber the women in the selected institutions of the country.

4.4.1. Usage of basic computer applications by academic staff of Ahmadu Bello University

Majority of the academic staff in A.B.U Zaria, with (97.2%), do make use of various computer applications to discharge their duties as revealed in figure 1. The finding can be explained by the significance of ICTs in the 21st century academia. Majority of the academic staff members use computer application(s) to discharge their duties because information and communication technologies, especially computer, comes witha lot of ease and assistance to theuser as it saves much time and energy.

The types of computer application(s) academics use, findings shows that the respondents use different computer applications in one way or the other to discharge their duties in the academia. Although it has been found that the majority of the respondents use only five computer applications revealed in table 4.2 to include Microsoft word, Excel, PowerPoint, Adobe Reader and SPSS application. This according to tenant of Uses and gratification theory that Individual has some needs related to communication and that he/she selects the media that appear likely to satisfy those needs. It can be said that in this case, the usage of mainly five computer applications by academic staff in A.B.U shows satisfaction of their needs with regards to using basic computer applications to discharge their duties and that they collectively/generally derive more gratification in using the said applications than any other computer application.Furthermore, it has been established from the findings of the study that there is a relationship between regular usage of computer application(s) and respondents' competency to handle or use the application(s). The respondents who use computer applications regularlyhad good competency and knowledge of the application(s) than those who do not, especially the five identified basic computer applications. We can deduce that in general, from data in table 4.4 that there is low ICT competency of basic computer applicationsamong the academic staff of A.B.U. These findings are in conformity with that of Archibong, Ogbiji and Anijaobi-Idem (2010) who found in a survey research titled ICT competence among academic staff in universities in Cross Rivers state, that there is low ICT competence among lecturers in those institutions.Carlson and Gadio (2002) posited that teacher training in the use of ICT is the best starting point in the ICT policy of a country because they are the key to making learning happen.Lecturers' ability and willingness to integrate ICTs into their teaching will largely be dependent on the professional training and development that they receive in relation to the information and communication technologies (Pearson 2003, Watson 2001, Williams 2003, Selinger&Autin 2003).

A cross tabulation ofusage of various computer applications according gender and age category of the respondents showed a trend and agreement with the theory in which the study is anchored(UTAUT). Age and gender as argued by propounders of the theory, Venkatesh, Morris, Davis and Davis (2003), are part of the variables supporting the four main independent variables of the UTAUT theory, that have indirectly influenced the dependent variables via the four main concepts: Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC). Statistical analysis showed male academic staff in A.B.U use various computer applications more than their female counterparts. Also, lecturers who fall in the age category of 21-30 and 31-40 use computer application better than those in the age brackets of 51-60 and 61-70 respectively. Findings also show that the majority of the lecturers who use ICTs or computer applications in A.B.U learnt how to operate and use the application(s) on their own, without going for a formal training this, could be attributed to the factor of social influence. Venkatesh, Morris, Davis and Davis (2003), in their theory view social influence as the degree to which an individual perceives that important others (friends and associates) believe he or she should use the new system.This also affirmed an earlier study on ICT usage in higher institutions of Turkey, which showed that most of those who adopted computer when it was introduced are relatively the young people in the sample; more than two-thirds of the computer users in turkey's higher institutions (70.7%) are between 30 and 45 years old (Gubahar 2008).

The majority of the respondents in the study, with (76.0%), indicated that ICT helps much to improve the discharge of academic duties in A.B.U. Ekeke and Mbachu (2015), in their study on the place of information and communication technologies ICTs in teaching and learning in Nigerian tertiary institutions, argued that the use of ICTs in schools by staff and students have become a necessity as it can be used to improve the quality of teaching and learning in any tertiary institution. ICT is also a key tool that is having a revolutionary impact on educational methodology globally. This study further established that the(44.5%) of the respondents who do not use any of the computer application to lecture students mentioned thatfacilities are not available. Lack of skills and knowledge of the applications, issue of techno phobia, smart boards not connected and some state their reasons as that courses are better taught using white board and maker. For others, inconsistency in power supply are among other reasons for not using any computer applications packages to deliver lectures for their students in A.B.U Zaria.Propounders of the UTAUT,Venkatesh, Morris, Davis and Davis (2003), argues that facilitating condition plays a significant rolefor technology to be adopted and used by people. Facilitating condition, according to them,refers to the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system or technology.

Findings further revealed that although lecturers in A.B.U can access internet in their offices, the vast majority use their personal modem and personal GSM data subscription to access the internet. Byimplication, the university provided internet access is not reliable. Virtual communication among lecturers and their students in A.B.U is mostly done via e-mail. This agrees with the findings of Nweze and Chenwe (2010)that the majority of lecturers at the Obafemi AwolowoUniversity prefer to use e-mail mainly when it comes to internet communication. Ojedukun and Owolabi (2003) also found email to be the common and the easiest form of communication among academics in Botswana. Perhaps, we can say e-mail communication is easier and simple, as it does not require too much technicality compared to other media of communication in the internet.

4.4.2. The awareness, access and utilization of academic e-resources by the academic staff of A.B.U

All questions under this, were aimed at identifying the various types of online electronic information resources known, accessed and used by the academics in Ahmadu Bello University Zaria. In order to achieve this, a list of e-resources platforms were outlined for the respondents to tick as many as possible, the e-resources or database they know access and use. The vastmajority of lecturers in A.B.U know about academic e-resources. However, they got their knowledge about academic e-resource through different ways as table 4.8 reveals. Colleagues, the internet and training/workshops are the means through which the lecturers acquire knowledge of academic e-resources in A.B.U. This agrees with the research findings of Renwick (2005), in which he examined the knowledge and use of electronic information resources by faculty at the University of the West Indies. The findings show a high level of awareness (80%) of electronic resources made available by the library, but low use of the library specific resources.Nweze and Chinwe (2010), in their study, opined that irrespective of where the knowledge comes, most lecturers might be aware of different academic e-resources platforms or data base.

Ahmadu Bello University as an institution, like every other institution in 21st century, pays annual subscription to a substantial number of academic e-resources platforms.However, findings show that the majority of academics in A.B.U do not access and use virtually all the aforementioned academic e-resources platforms captured under table 4.9.Hinari, for example with (65.2%) of the respondents, do not access and make use of it.Ardi(84.0%), Ajol(64.9%), Bio one(58.8%), Wikiversity(84.3%), Agora (71.4%), Research gate (70.5%), Popline(93.2%),Jstore(60.9%),Doaj(66.5%),Oare(85.4%), Questia(84.9%), Wiley interscience(87.1%) of the respondents who never access and use them. However, the only frequently accessed and used academic e-resources by A.B.U lecturers are Google scholar with (58.5%) of respondents accessing and using it, Science direct with(57.2%) of the respondents also the majority access and use the platform. PubMed is also accessed and used majority of the respondents with 51.1%.

Perhaps the huge non-usageof various academic e-resources by A.B.U lecturers can be argued to have been contributed byfactor of power supply, computer literacyand lack of network connectivity among, others. In corroborating this argument, Elizabeth and Ronke (2015) found, as part of their findings slow download, power outage and lack of personal computer as factors militating against the use ofonline academic resources by the lecturers in OlabisiOnabanjo University. Isah (2010) in his study of electronic library use in the University of Ilorindemonstrated that academic staff are fully aware of the electronic library resources. The majority of the respondents (70%) claimed that they do not visit e-library to access e resources, while only (36.6%) indicated that they access the e-library resources from their offices. Respondents are computer literate. However, slow internet access, power outage and non-availability of e-resources relevant to their information needs were indicated as hindrances to the use of e-library. All these factors and many more, are captured as facilitating conditions explained earlier by Venkatesh, Morris, Davis and Davis (2003).

A cross tabulation of respondent's access and utilization of various academic e-resources in accordance with the twelve faculties of A.B.U shows a trend in the little usage of academic e-resources platforms according to disciplines. Hinari academic e-resources for instance, is meant for only biomedical and medical related course only. The cross tabulation revealed that in A.B.U the majority ofHinari users are from the faculties of Human medicine, Veterinary medicine and Pharmaceutical sciences.AJOL (African Journals online) is open to all disciplines. However, in A.B.U only lecturers from the faculty of Veterinary medicine with (70.0%), Human medicine with (64.0%), Agriculture with (63.6%) and faculty of Sciences with (54.9%) respondents access and useAJOL. The majority ofPubMedusers are from the faculty of Human medicine (88.0%), Veterinary medicine(80.0%) and faculty of Pharmaceutical sciences(66.7%).This is because PubMed provides resources for only medicine and other health related disciplines.

The majority of lecturers in the faculty of Agriculture are the only main users of AGORA. AGORA is an acronym for Access to Global Research on Agricultural programs. TheMajority of respondents from faculty of Sciences, Agriculture and Environmental design indicated to be accessing and usinge-resources from Bio one, as it provides resources on Biology, Environmental Sciences, Sustainable Agriculture and other science related disciplines. Also,Respondents from the faculty of Human medicine with (76.0%), are the highest users of Science direct e-resource, respondents from the faculty of Engineering with (55.0%) respondents also access and use Science direct, Agriculture (68.2%), Sciences (68.6%), Veterinary medicine (45.0%) respondents access and use e-resource from science direct. However, faculty of Arts with (36.4%), Education with (43.5%), Law with (44.4%) and faculty of Social science with (36.8%), Environmental design (37.2%) are among the least faculties in A.B.U that access and use e-resources via Science direct. It is also an all open access with academic resources virtually for all disciplines.

Jstor is another academic e-resource that gives academic resources to over 50 disciplines. It is very common and popular among the lecturers from the faculty of Sciences and Agriculture as their majority (74.5%) and (54.5%) access and use academic e-resources from it. Jstore is not common and popular among the majority of lecturers in other faculties like Education, Law, Engineering and Social sciences among others.Directory of Open Access Journals (DOAJ) is also an open access and multidisciplinary academic resource. However, only lecturers from the faculty of Sciences, with (70.6%) and their counterparts from Engineering with, (64.9%) refer and use academic resources from DOAJ.Lack of awareness of about the existence of Jstore and DOAJ and other academic e-resources may be viewed as possible reason for low access and utilization among lecturers in the Ahmadu Bello University Zaria.

Google scholar is the only most popular and common academic e-resources among A.B.Ulecturers, as the majority of the respondents from the whole 12 faculties indicated to have been consulting and using the platform for research and knowledge update, although Google scholar is for all disciplines.These findings are in consonance with that of Sharma (2009), who found in Guru Gobind Singh Indraprastha University Delhi India, that lecturers use e-resources platforms according to faculties and areas of interest and discipline. Also,in a study of perception and attitude of lecturers of institutions ofKwara state, Onasanya, Shehu, Oduwaiye and Shehu (2010), established that science-oriented lectures' attitude towards more integration of ICTs into higher institutions and usage of academic e-resources is higher than non-science oriented lecturers. Less and moderately experienced lecturers are more exposed to the use of ICTs than highly experienced lecturers are. In addition, Nweze and Chenwe (2010) also found in their study of the Obafemi Awolowo University that the majority of the lecturers always refer to e-resources platforms peculiar to their areas of specialization or discipline.However, they argued that one cannot rule out the fact that some lecturers in the institutions consult academic e-resource that are open for all disciplines. E.g. Google scholar, Science direct, Journals of interdisciplinary, Jstor among others.

4.4.3. The challenges encountered by A.B.U academic staff in utilizing ICT

In A.B.U there is no much awareness about the existence and subscription to academic e-resources by the university authority for the lecturers. Respondents unanimously agreed that awareness creation by the university authority on the availability and access to academic e-resources is notsufficient enough to get all of the academics aware and use them, despite the fact that the university management pays for subscription to some of the academic e-resources platforms annually.Omolayole (2002) mentioned some pervasive issues that seem to cut across all countries in Africa. They include low level of computer culture, general lack of awareness or poor ICT skills and poor telecommunication infrastructure. Chisanga (2004) found from a study that lack of fund and inadequate personnel with ICT skills constitute the main problem of ICT in universities.

Furthermore, there is also need for timely training and workshops for lecturers in A.B.U concerning ICTs and access to academic e-resources platforms. Lecturers in their majority (77.5%) indicated their agreement that the current trend of training and workshops are not enough, as it has grossly affected their knowledge and skills of ICTs and as well access and utilization of academic e-resources. On ICT skills, the majority of the lecturers, with (78.2%), are in agreement with the statement that the low level ICTs skills they possess accounts for the negative effect on them when it comes to exploring computer and the internet in the academia. This can also be one of the reasons why most of the academic e-resources and computer applications are not fully utilized and harnessed in A.B.U. These findings, however, contradict that of Egberongbe (2011) with the title the use and impact of electronic resources at the University of Lagos. He found that themajority of lecturers at the University of Lagos are aware of and use, electronic resources.This, according to his findings, is because, the majority of them had attended various workshops and training on accessing and utilizing academic e-resources platforms or data base for academic delivery.Archibong&Effiom (2009) found that lack of interest, limited access to ICT facilities and lack of training opportunities constitute the major problem of ICT usage by university academics.

Another serious issue confronting lecturers in A.B.U is the problem of slow network connectivity or poor network. It grossly affects their access and utilization of academic e-resources platforms for academic delivery. The internet service provided by the school management does not cover the entire offices of the academics, and the ones connected are having problem of the network not being strong enoughin most cases, to connect the net and download e-resources.This makes it not reliable, as such many lecturers resort to other means to access the internet. Themajority use personal modem and GSM data subscription to browse the net.Lecturers in A.B.U are faced with the problem of excess workload due to inadequate manpower in the system. This denies them time to explore and utilize ICTs and as well access academic e-resource.Ijeoma, Joseph & Franca (2010) opined that inadequate ICT facilities and excess workload are major challenges to ICT usage among academic staff in Nigerian universities. Given that, the academicians are the key to effective usage of information technologies in the university education system.Oduwole, (2000) and Jegede's (2001) findings agreed with this study. They also found that the degree of availability and utilization of ICT in a large number of Nigerian universities and their class rooms is still low, observing that some universities are just making efforts to adopt ICT.

Inconsistency in power supply and unnecessary interruption especially during working hours, pose serious problems with negative consequences on A.B.U's lecturers ability to use ICTs, as using it requires steady electricity supply. Too much workload, poor network connectivity and power outage are among the major factors militating against the use of ICTs in the university of

Jos, Benue State University, University of Ilorin, Obafemi AwolowoUniversity,OlabisiOnabanjo University, Cross River state University of technology and University of Calabar(Nwachukwuand Asom 2015;Agber, and Agwu 2013; Isa 2010; Elizabeth and Ronke 2015; Archibong, Ogbiji&Anijaobi-Idem 2010, Raseroka 1999).Venkatesh, Morris, Davis and Davis (2003) classified power outage and poor connectivity of network as facilitating conditions. Facilitating conditions, according to them refers to the degree to which an individual believes that an organizational and technical infrastructure exist to support the use system or technology. As far back as 1994, Zulu maintained that all obstacles and challenges must be surmounted for the universities in Africa to enjoy quality ICT utilization.

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter present summary of the major findings of the study. It also contains the conclusion of the study and makes some recommendations based on the findings of the study. The chapter also highlights some suggestions for further studies related in the area.

5.2. Summary

It was discovered that lecturers useat least one or more computer applications to carry out their academic duties. On a general note, lectures' usage of basic computer application(s) aretilted towards only Microsoft word, excel power point, Adobe reader and SPSS. Lecturers lack more computer skills and competency to use other computer applications beyond the ones listed above. Findings show that there is significant difference in the pattern of usage of computer applications, according to age and gender among the respondents.The majority of academics in A.B.U do not attend formal training in ICTs they use; they are socially influenced to use the technology. A.B.U internet access provision is not that much reliable, thus academics use their personal modems and GSM data subscription to access the internet from their offices. The lecturers preferred mostly e-mail as the media of communication with their students via the internet. Also discovered is the fact that, lecturers get to know about academic e-resources platforms mostly through their colleagues and the internet. Access and utilization of academic e-resources in general is low in A.B.U. Access to e-resources platforms varies from faculties and disciplines. Google scholar,Ajol, Research Gate, Science direct and Bio one are the only e-resources platforms some A.B.U lectures are mostly aware of, access and utilize under e-resources open for all disciplines. It was further discovered that there is no frequent training and workshops on ICTs for many lectures and there is no much awareness from A.B.U authorities on academic e-resources platforms.There is low ICT skills possessed by lecturers in the school as many could not explore various computer applications beyond Microsoft word, excel, power point, and Adobe reader. Excess workload, power outage, lack of interest, poor network connectivity, inadequate training, low awareness creation and lack of ICT facilities are identified as major problems A.B.U lecturers face when utilizing computer applications or accessing academic e-resources platforms.

5.3. Conclusion

Despite the fact that ICT isregarded as the world's most influential instrument for the development of quality teaching, learning and research in the educational system around the world, the highly experienced lecturers inA.B.U Zaria are yet to take full of its monumental revolution in education. This is due to the problem of adoption, technophobia,lack of interest, unskillfulness as well the infrequent usage of ICT facilities within the university.

5.4. Contribution to knowledge

1. The study has established poor skills and competency as the major challenge to utilization of ICT among academic staff in A.B.U

2. The study has also revealed that multi-disciplinary research e-resources are used mostly in the Human Medicine faculty, Veterinary medicine, Science, Agriculture and Pharmaceutical Sciences than the Faculties of Law, Education, Social Sciences, Arts, Environmental Design, Engineering and Administration. The implicationis thatexposure to multidisciplinary learning and research resources is low in Law, Education, Social Sciences, Arts, Environmental Design, Engineering and Administration.

5.5. Recommendations

Based on the findings from the study, it is therefore recommended that:

1. The management should, on its own or in collaborationwith NGOs, be organizing timely workshops and training for lecturers especially the highly experienced ones, specifically for the purpose of facilitating their literacy, awareness and skills in using ICTs;
2. The federal government and A.B.U management should do more by providing every lecture room or class with a permanent projector and other ICTs facilities for teaching and learning and backed by policy on usage;
3. The management should liaise with theIyaAbubakar computer institute to organize free and compulsory training for all lecturers on various computer applications needed in the academia;
4. The A.B.U management should introduce policies on strict utilization of some computer applications like power point and turnitin especially at the post graduate level.
5. The federal government, ministry of education and NUC should implement policies on compulsory ICT usage in tertiary institutions, this will help the adoption of ICT and its use in teaching and learning;
6. To solve the problem of poor network, the management should engage experts that would help to maintain, manage and boost the main cyber on timely basis;
7. To address the issue of excess workload, the management should expand its budget and employ more competent hands with ICT skills into the system;
8. To address the problem of power, the study recommends that A.B.U should have an independent power source, either through hydro (via the dam in the school) or through the solar system.

5.6. Suggestions for further studies

Research on the use of information and communication technologies in the academia cannot be said to have been exhausted. This means that further studies can be carried out in the following areas:

1. Comparison between the North, South, East and Western parts of the country should be made, to know if culture and environment has an effect on the use of information and communication technologies by university dons in this 21st century.
2. This type of study should be carried out routinely in order to know the trend in adoption and usage of ICTs in A.B.U

References

Abels, E., Liebscher P., & Denman D. (1996). Factors that influence the use of electronic networks by science and Engineering Faculty at small Institutions Part 1- queries. *Journal of the American Society for Information Science.* 47(2):146 –158.

Adu, B. (2002). "Building a National Consensus for Sustainable and Business Friendly ICT", *African Telecom Summit*. Accra, Ghana, 12-14 March

Abdulwahab, L. &Dahalin, Z.M (2010). A Conceptual Model of Unified Theory of Acceptance & Use of Technology (UTAUT) Modification with Management Effectiveness & Program Effectiveness in Context of Telecentre. *Journal of African Scientist.* 11(4):267-275.

Agber, T. &Agwu, A. E. (2013). Assessment of online resources usage by Agricultural Science lecturers of tertiary institutions in Benue State, Nigeria. *American Journal of Research Communication* 1(10): 254-279

Aija, C. & Inga, S. (2012). Use of ICT teaching-learning methods make school math blossom International Conference on Education and Educational Psychology (ICEEPSY). *Journal Procedia - Social and Behavioral Sciences.* (69):1481 – 1488.

Ajayi, G. O. (2000). *Challenge to Nigeria of Globalization and the Information Age.* Keynote address at the Workshop on National Information Communication Infrastructure (NICI) Policy Plans and Strategies for Implementation, Maitama, Abuja, August.

Ajuwon G. A (2003). Computer and Internet Use by First Year Clinical and Nursing students in a Nigerian Teaching Hospital. *Journal of BMC Medical Informatics and Decision Making. 3 (10): 1472-6947*

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211.

Akinyosoye, H.I. &Oguntuase F.Z. (2007). Internet access and use by female academics in selected Nigerian Universities. *Pakistan Journal of Social Science.* 4(2):209-213.

Al-Ansari, H. (2006). The Internet use by faculty members of Kuwait University. *The Electronic Library, 26(6):791-803.*

Al-Gahtani, S. S., Hubona, G. S., & Wang, J. (2007). Information Technology (IT) in Saudi Arabia: Culture and the Acceptance and Use of IT. *Journal of Information & Management, vol.44, pp. 681–691.*

Alexander, O. (nd).ICT in developing countries. *A cross-sectoral snapshot.* A paper presented at HEC, University of Lausanne. Retrieved 06/09/2016from https://www.google.com.ng/?gws_rd=ssl#q=ICTs+in+developing+countries

Archibong, I. A., &Effiom, D. O. (2009). ICT in University Education: Usage and Challenges among Academic Staff. *Journal ofAfrica Research Review. 3*(2), 404-414.

Archibong, I. A., Ogbiji, J. E., &Anijaobi-Idem, F. (2010). ICT Competence among Academic Staff in Universities in Cross Rivers State, Nigeria. *Journal of Computer and Information Science. 3(4)*

Atinmo, M. I. (2000). Role of library information storage and retrieval systems in the information age. In library automation for the information age: concepts, technologies and strategies. BisiAjibola and MutaTiamiyu (eds) Ibadan: Centre for Leveraging Information for Productivity. 63 - 65.

Babbie, E. (2001). The Practice of Social Research (Second Edition.).California: Wadsworth PublishingCompany.

Babbie, E. (2005). The Practice of Social Research (Third Edition). California: Wadsworth Publishing Company

Bandura, A. (1986). Social Foundations of Thought and Action: A Social Cognitive Theory, Prentice Hall, Englewood Cliff, NJ.

Bar-Ilan, J., & Fink, N. (2005). Preference for electronic format of scientific journals: A case study of the science library users at the Hebrew University. *Library & Information Science Research* 27: 363-376.

Baran, S.J & Davis .K.D (2009). Mass Communication Theory: Foundations, Ferments and Future (5^{th} Edition). Boston: Wadsworth.

Barraket. J., & Scott, G. (2001). Virtual equality? Equity and the use of information technology in higher education *Australian Academic and Research Library Journal*. 32, No 3.

Barton, R. (2004). Why use computers in practical science? Teaching secondary science with ICT. Indiana: Open University Press.

Becker, H. (2000). Findings from the teaching, learning and computing survey: Is Larry Cuban right? *Education Policy Analysis Achieves,* 8 (51).

Bello, R., &Ajayi, O. (2000). *Research Methods and Statistical Analysis.*Ilorin:Haytee Press and publishing company.

Benbasat, I.,&Barki, H. (2007) Quo Vadis TAM? *Journal of the Association for Information Systems,* 4**,** 211-218.

Biddiscombe, R.W. (2001). The development of information professional needs for Internet and IT skills at the University of Birmingham. *Journal of Electronic Information and communication system.* 35(2): 157-166.

Bondaryk I. (1998). Publishing new media in higher education: overcoming the adoption. *Hurdle Journal of Interactive Media in Education.* 98 (3): 93-99.

Bordens, K. S., & Abbott, B. B. (2002). Research design and methods: A process approach (Fifth Edition). San Francisco: McGraw Hill

Bransford, J., Brown, A. L., & Cocking, R. R. (2000). How People Learn: brain, mind, experience, and school (Second Edition). Washington, D.C.: National Academy Press.

Brown, T. H. (2005). Towards a model for E-Learning in Africa. *International Journal on E-Learning. 4(3): 299-316.*

Carlson, S., & C. T. Gadio. (2002). "Teacher Professional Development in the Use of Technology", in Haddad, W. and A. Drexler (eds). Technologies for Education: Potentials, Parameters, and Prospects. Washington DC: Academy for Educational Development and Paris: UNESCO.

Chava, F. N.,& David, N. (1996). Research Methods in the Social Sciences. (Fifth Edition). India: Replika Press Pvt Ltd

Chisenga, J. (2004). The use of ICTS in African public Universities survey of ten countries in Anglophone Africa. *International network for the availability of scientific publications* (INASP). UK.

Cholmsky, P. (2003). Why GIZMOS Work: Empirical evidence for the instructional effectiveness of explore learning's interactive content. Retrieved on 11/3/2016 fromhttp://www.explorelearning.com.

Cohen, l., Manion, L.,& Morrison, K. (2000). Research Method in Education (Fifth Edition). London: Routledge Falmer

Colwell, R. (2000). Information technology. Ariadne's threads through the research and education labyrinth. *EDUCAUSE,* 15-18; Retrieved 08/28/2015, from http://www.educause.edu/pub/er/ermoo/article003.colwell

Dadzie, P. S. (2005). Electronic Resources: access and usage at Ashesi University College. *Campus – wide Information Systems* 22(5).

Dangani, U. B., & Mohammad, Z. (2009). Information and Communication Technology Literacy among Academics in Ahmadu Bello University Zaria. *Samaru Journal of Information Studies. 9 (2)*

Davarpanah, M. (2000). Level of information technology application in Iranian University Libraries.*Journal ofLibrary Review*.50 (9): 445-450.

Davis, F.D. (1989). Perceived usefulness, Perceived ease of use and user acceptance of information technology. *MIS Quarterly*. 13(3):319-340.

Davis, F.D., Bagozzi R.P., &Warshaw P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology* 6(22):1111-1132.

Dawes, L. (2001). What stops teachers using new technology? In M. Leask (Ed.), Issues in Teaching Using ICTs (pp. 61-79). London: Routledge

Defleur, N.,& Dennis, E. (1996). Understanding Mass Communication: A Liberal Arts Perspective. Boston: Houghton Mifflin Company.

DeVellis, R. F. (2003). Scale Development: Theory and Applications. Thousand Oaks, CA: Sage (Unbuilding Likert Scales)

Egberongbe, H. S. (2011). The Use and Impact of Electronic Resources at the University Of Lagos. *Journal of Library Philosophy and Practice.* 7 (4) 72 - 98.

Ehikhamenor, F.A. (2002). Socio economic factors in the application of information communication technologies in Nigerian print media.*Journal of American Society of Information Science and Technology*. 53(7): 602-607.

Ekeke, J. T.,&Mbachu, C. E. (2015). The Place of Information, Communication and Technology (ICT) in Teaching and Learning in Nigerian Tertiary Institutions. *Journal of Educational Research. 3(3): 340-347.*

Elizabeth, O. R., &Ronke, A. S. (2015). Use of Library Electronic Information Resources by Academic Staff in OlabisiOnabanjo University Global Advanced Research*. Journal of Educational Research and Review, 4(4): 055-062.*

Emmanuel O.U., &Ngozi E. B. (2014). An Analysis of ICT impact on the Curricular of Major Nigerian Universities in the Last Ten Years 2003-2013. *International Journal of Science and Technology Vol.3 (1).*

Fishbein, M., &Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Massachusetts: Addison-Wesley Publishing Company.

Freyhiowot, N.,&Negassa .G. (2008). *Audience Survey Conducted on 'Dewel' Radio Program.* Addis Ababa: WAAG Communications

Friedler, Y.,& McFarlane, A. (1997). Data logging with portable computers: A study of the impact in graphing skills in university students. *Journal of Computers in Mathematics and Science Teaching. 16(4), 527-550.*

Gahtani, S.S., Hubona, G.S.,& Wang, J. (2007). Information technology (IT) in Saudi Arabia:Culture and the acceptance and use of IT. *Journal ofInformation & Management*, (44), 681-691.

Gaibreath, J. (2000). Knowledge Management Technology in Education. An overview. *Educational Technology,* 40 (5), 28 - 33. Information Technology Underused in Education (2003). Retrieved 18/12/2015 fromhttp://www.mff.orQ/edtecharcle.taf?Function=detail & content/uid1

Gates, B. (1994). Multimedia technology and education: progressive products and powerful promises. *Booklist* 90; 23-31.

Genoni, P., Merrick, H.,&Willson, M. A. (2006). The scholarly communities, e-research literacyand academic librarian. *The Electronic Library 24*(6)*:737-746.*

Gubahar, Y. (2008). ICT Usage in Higher Education: A Case study on Preservice Teacher and Instructors. *The Turkish Online Journal of Educational Technology, 7*(1).

Hall, M. (1998). Africa connected *First Monday 3.4 http://firstmonday.org/issues3_4/hall/index*

Haliso, Y. (2011). Availability and utilization of information communication technology and effective job performance in academic libraries in South West Nigeria. Retrieved 03/10/2015 from http://unllib.unl.edu/LPP/haliso.htm

Harrison, C., Comber, C., Fisher, T., Haw, K.,& Lewin, C. (2002). The impact of information and communication technologies on pupil learning and attainment. Retrieved 13/12/2015 fromhttp://partners.becta.org.uk/pagedocuments/research/ImpaCT2strand1bw

Harlen, W. (1999). Using computers foreffective teaching of science. A review of research. The Scottish Council for Research in Education.

Heeks, R. (2002). Information Systems and Developing Countries: Failure, Success, and Local Improvisations. *The Information Society*, 18(2), 101-112.

Hirtz, S., Harper, D. G.,& Mackenzie, S. (2008). Education for a Digital World: Advice, Guidelines, and Effective Practice from Around the Globe. Vancouver: Commonwealth of Learning.

Howell, C.,&Lundall, P. (2000). Computers in Schools: A National Survey of Information Communication Technology in South African Schools. Education Policy Unit. Cape Town: University of the Western Cape, Retrieved 16/08/2015 from *http://www.school.za/schoolsurveys/suveys_index.htm*

Iahad, A. N., Madar, M. J., Oye, N. D., & Rahim, A. N. (2012).The impact of e-learning on students' performance in tertiary institutions. *IRACST – International Journal of Computer Networks and Wireless Communications (IJCNWC)*, 2, 121-130

Iding, M., Crosby, M. E., &Speitel, T. (2002). Teachers and Technology: Beliefs and Practices. *International Journal of Instructional Media, 29 (2), 153-171*

Idowu, A.O., &Mabawonku, I.M. (1999). Information technology facilities and application in some Nigerian Universities Libraries. *African Journal of Library, Archival and Information Science* 9; 1:27-35.

Ijeoma, A. A., Joseph, E. O., & Franca, A. (2010). ICT Competence among Academic staff in Universities in Cross Rivers State, Nigeria. *Computer and Information Science*, *3*(4), 109-115.

Im, I., Hong. S., & Kang, M.S. (2011). An international comparison of technology adoption, Testing the UTAUT Theory. *Journal of Information & Management.* 48(6): 1–8

Isah, A. (2010). Electronic Library Use by Academic Staff at the University of Ilorin, Nigeria *Journal of Library and Information Science, 7 (1 & 2).*

Islam, A.,& Panda, K.C. (2007). Web information retrieval trends of researchers: A case study ofSambalpur University, India. *The Electronic Library, 25(6):*725-765.

Jackson, J.D., Park, J.S., Probst, J.C., & Yi, M.Y. (2006). Understanding information technology acceptance by individual professionals: toward an integrated view.*Information and Management journal*,43(4): 350–363.

Jansen, M. (1997). Bridging the gaps in internet development in Africa. Retrieved 16/08/2015 from http://www.internetworldstats.com/stats/htm.

Jager, A.K., &Lokman, A.H. (1999). Impacts of ICT in education: the role of the teacher and teacher training. *Paper Presented at the European Conference on Educational Research, Lahti, Finland, on 22nd – 25th September*. Retrieved on 21/12/2015 from http://www.leeds.ac.uk/educol/documents/00001201.htm.

Jegede, P. (2001). Acquisition of skills in emerging technologies through continuing professional education: The Nigerian perspective. *Paper presented at the 4th World conference on continuing professional education for the library and information professionals, Ibadan.*

Jimoh, A. T. (2007). Students' attitude towards ICT in Nigeria tertiary institutions. *Education Focus, 1*(1), 73-79.

Johnson, O. A. (2007). Enhancing Quality in Higher Education through Information and Communication Technology in Nigeria. In J. B. Babalola, Akpan, G. O., Ayeni, A. O. & Adedeji, S. O. (Ed.), *Access, Equity and Quality in Higher Education*: NAEAP Publication.

Kaplan, D. (2001). "Defining the Information Society, Initial Preparatory Workshop", *United Nations World Summit on the Information Society,* Coppet, Switzerland, 5-6 December

Khalid, A. B. (2009). Barriers to the Successful Integration of ICTs in Teaching and Learning Environment: A Review of the Literature. *Eurasia Journal of Mathematics, Science & Technology Education, 5 (3), 235-245*

Kinengyere, A. A. (2007). The effect of information literacy on the utilization of electronic information and resources in selected academic and research institutions in Uganda. *The Electronic Library journal,* 25(3):328-341

Kim Y., Chun Y., Song J. (2005). Investigating the Role of Attitude inTechnology Acceptance from an Attitude Strength Perspective. Retrieved 20/08/2015 from http://www.ou.edu/is-core/Program2005/Papers/Kim-Chun-Song

Kirschner, P. &Selinger, M. (2003). The state of affairs of teacher education with respect to information and communication technology.*Journal of Technology, Pedagogy, and Education, 12* (1): 5 – 17

Kiplnagat, J. K., &Kariuki, S.M. (2005). Information and Communication Technologies (ICTs) adopted by small and medium scale enterprises (SME) Tourism stakeholders in the Durban region.*South Africa African Journal of Library Achieves and Information Science, 15 (2), 133-140*

Kreizman, A. (1999). How Computers have changed the wage structure: evidence from micro-data: *Quarterly Journal of economics*, 58 (11): 33-60.

Kumpulainen, K. (2007). Educational Technology: Opportunities and challenges. Oulu:Finland University of Oulu.

Law, N. Y. (2000). Conceptual Framework for Use of ICT in Education: Roles of Interactions of the Learners, Teacher & The Technology: Faculty of Education, University of Hong Kong.

Lefebvere, S., Deavdelin, D., &Loiselle, J. (2006). ICT implementation stages of primary school teachers: The practices and conceptions of teaching and learning. *Paper presented at the Australian Association for Research in Education National Conference, Adelaide, Australia*.

Lin, C.P., &Anol, B. (2008). Learning online social support: an investigation of network information technology based on UTAUT. *Journal of Cyber psychological Behavior*, 11(3): 268-272.

Lucas, H. (2000). Information Technology for Management. New York: McGraw-Hill.

Madhusudan, M. (2008). Use of UGCinfornet e-journal by research scholars and student of University of Delhi.*Delhi, Library Hi tech*, 26 (3):369-386

Malhotra, Y. (2004). Extending the Technology Adoption Model to account for social influence. Theoretical basis and Empirical validation. Proceedings of the 32nd Hawail International Conference on System Sciences.

McQuail D. (2010). Communication Theory (6th Edition). London: *Sage Publications*.

Milken Exchange on Education Technology (1998). Technology in American Schools: Sevendimensions for gauging progress. Retrieved 02/02/2016, from http://www.mff.org/pubs/ME158

Milken Exchange of Education Technology (1999). Will new teachers be prepared to teach in a digital age?Santa Monica: Milken Family Foundation. Retrieved 08/20/2015 from http://www.mff.org/pubs/ ME1544df.

Moghavvemi, S., Salleh, N. M.,&Abessi, M. (2013). Determinants of IT-related innovation acceptance and use behavior: theoretical integration of unified theory of acceptance and use of technology and entrepreneurial potential model. *IranianJournal of social technologies, 3(2): 243–260*

Mutula, S. (2002). E-learning initiative at the University of Botswana: Challenges and Opportunities: *Campus-wide information systems Journal*,19(3): 99-109

Müller-Falcke, D. (2006). The Impact of ICT on Small Enterprises: The Case of Small-Scale Industry in India. In: Torero, M. and von Braun, J (eds.): Information and Communication Technologies for Development and Poverty Reduction – The Potential of Telecommunications. Baltimore, 174-178

Nakhleh, M.B., &Krajci B. (1994). Influence of levels of information as presented by different technologies on students understanding of acids, base & pH concepts. *Journal of Research on Science Teaching,* 31 (10): 1077-1096.

Ndiaye, A. L. (2001). African Universities and the Challenge of Knowledge Creation and Application in the New Century. Paper presented at the Association of African Universities 10th General Conference, Nairobi, Kenya.

Noor, F., Mohamad, N., Anna A., &Leelanayagi R. (2014). The Unified Theory of Acceptance and Use of Technology (UTAUT) and the Goods and Service Tax (GST) Application System.*Research Journal of Applied Sciences, Engineering and Technology,* 8(17): 1911-1916.

Nwachukwu, V. N., &Asom, F. (2015).Utilisation of Computer Technology for Academic Work by Lecturers of University of Jos, Nigeria.*International Journal of Library and Information Science Studies, 1(2):14-22.*

Nwezeh, M. T.,&Chinwe, M. (2010). The Use of ICTs in Nigerian Universities: A CaseStudy ofObafemi Awolowo University, Ile-Ife. *Journal of library philosophy and Practice, 2(3), 30-49.*

Oduwole A. A., &Akpati, C. B. (2003). Accessibility and retrieval of Electronic Information at the University of Agriculture Library Abeokuta, Nigeria. *Journal information science,* 52(5): 228 – 233.

Ofodu, G. O. (2007). Nigeria Literacy Educators and their Technological Needs in a Digital age. *Journal ofEducation Focus,* 1(1): 22-30.

Ogbuoshi, L. I (2006). Understanding Research Methods and Thesis Writing. Enugu: Linco press

Oguntuase, F. Z. (2009). Information Communication Technologies Management by Universities and Utilization as Factors Influencing Scholarly Publications. *Journal of information and management science*, 2 (2): 182 – 199.

Ojedokun, A.A., &Owolabi, E.O. (2003). Internet use for teaching and research in Botswana. *African Journal of Library, Archives and Information Science,* 13(1):43-53

Ogunseinde, G. (1996). Government Licenses eleven firms for Internet Services *Computers in African* Lagos pp 36.

Oketunji, I. (2001). Application of information technologies in Nigerian Libraries: problems and prospects. Paper presented at the 10th Biennials conference of the National Association of Library and Information Science Educators, University of Ibadan. 7-20.

Onasanya, S. A., Shehu, R. A., Oduwaiye, R.O., &Shehu, L. A (2010). Higher Institutions Lecturers' Attitude Towards Integration of ICTs into Teaching and Research in Nigeria. *Research Journal of Information Technology, 2 (1): 1-10*

Okello-Obura, C., & Magara, E. (2008). Electronic Information access and utilization by staff and students of Makerere University, Uganda. Accessed 12/06/16 from http://creative commons.org/licenses/by/2-0

Okwalagwe O. A., &Njoku, I. F. (2002). Availability and accessibility of Information Communication Technology (ICT) to Nigerian publishers for book marketing business *African Journal of Educational Management,*10 (1): 79-92.

Oliver, R. (2003). The role of ICT in higher education for the 21st century: ICT as a change agent for education. Retrieved 06/08/2015 from http;//efroud.scam.ecu.edu.au/0liver/2002/he 2/

Osei, T. A. (2007). ICTs for Education in Nigeria: Survey of ICTs and Education in Africa: Nigeria Country Report. Accessed 22/2/16fromwww.Infodev.Org

Oye, N. D., Salleh, M., &Iahad, N. A. (2011). Challenges of E-learning in Nigerian Universities Education Based on the Experience of Developed Countries. *International Journal of Managing Information Technology, 3*(2), 39-48.

Oye, N. D.,&Iahad, N., Rahim, N. (2012). A Comparative Study of Acceptance and Use of ICTs among University Academic Staff of ADSU and LASU: Nigeria. *International Journal of Science and Technology, 1(1), 202-232.*

Ozohu-Suleiman, Y. (2008). Scanning the Interface of New Communication technologies and the New World Information and Communication Order. *Journal of media and communication, 1(3), 50-59.*

Pajo, M.,& Wallace, C. (2001). Barriers to the uptake of web-based Technology by University Teachers. *Journal of Distance Education, 16,* 70-84.

Patterson, R., & Wilson, E. (2000). New information technology and social inequality: resetting the research and policy agenda. *Journal ofInformation Society,* 8(6):16-77 86.

Pulkkinen, J. (2007). Cultural globalization and integration of ICT in education. Oulu: University of Finland Press.

Raseroka, H.K. (1999). The role of University libraries in African Universities. Association of African Universities (AAU) Occasional paper, 3:12.

Roffe*, I. (*1995). "Management with new technology for women: A decade of development", *Journal of European Industrial Training, 19 (4): 287-297*

Rogers, E. (2003). Diffusions of Innovations, New York: The free press.

Romeo, G. I. (2006). Engage, empower, enable: Developing a shared vision for technology in education. *Engaged Learning and Emerging Technologies.* The Netherlands: Springer Science.

Ruggiero .T.E (2000). Uses and Gratifications Theory in the 21st Century. *Mass Communication & Society.* Vol. 3(1), 3–37.

Saye, J. D. (2001). The organization of e-resources in library and information science curriculum. *OCLC Journal systems and services*, 17(2): 71-78

SanMartin, H., & Herrero, A. (2012). Influence of the user's psychological factors on the online purchase intention in rural tourism: Integrating innovativeness to the UTAUT framework. *Journal of Tourism Management,* 33(2): 341-350.

Sansanwal, D.N. (2009). Use of ICT in Teaching – Learning and Evaluation. Central Institute of Education Technology, New Delhi. *Educational Technology Lecture Series 5.*

Shamatha, J. H., Peressini, D., &Meymaris, K. (2004). Technology-Supported Mathematics Activities Situated within an Effective Learning Environment Theoretical Framework. *Contemporary Issues in Technology and Teacher Education, 3 (4), 362-381*

Sharma, C. (2009). Information Technology and Online Resources in Dental College Libraries of Haryana Guru Gobind Singh Indraprastha University, Delhi, India. *Journal of library philosophy and practice, 2(3):226-245*

Shahriza, K., Nor, A.,& Hasan, A. (2007). Reading habits and attitude in digital age: Analyses of gender and academic program differences in Malaysia. *The Electronic Library, 25*(3):285-297.

Shoham, S. (1998). Scholarly Communication: a study of Israel academic researchers. *Journal of Librarianship and Information Science,* 30(2):112- *113.*

Strassmann, D. (1997). Effective use of ICTs in Tertiary Institutions of Science and Technology in Europe. *Journal of computer Education 47 (6), 373-398*

Straub, E.T. (2009). Understanding Technology Adoption: Theory and Future Direction for Informal Learning. *Journal ofReview of Educational Research,*9(2): 625–664.

Suleiman, A. A; Mani, A. K.,& Muhammad, U. (2012). Technophobia versus ICT Acceptance and Use in Teaching and Learning among Academic Staff OF Universities in Northern Nigeria. *Paper presented at the British Educational Research Association Annual Conference, University of Manchester.*

Talhami, L. (2009). "American Theological Library Association Summary of Proceedings". American Theological Library Association. pp. 243-246. ISSN 0066-0868.

Taylor, S., & Todd P.A. (1995). Understanding Information Technology Usage: A Test of Competing Models, *Journal ofInformation systems Research* 6 (2): 144 -176.

Thompson R.L., Higgins C.A.,& Howell J.M. (1991). Personal computing toward a conceptual model of utilization, *MIS Q quarterly*, 15(1): 125-143.

UNESCO, (2007). The UNESCO ICT in education program. United Nations Educational, Scientific and Cultural Organization (UNESCO): Bangkok, Thailand. Retrieved 2/06/2015 from www.unescobkk.org/education/ict.

Venkatesh, V., Morris M. G., Davis, G. B., & Davis F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(4): 425-478.

Wang, Q.,& Woo, H. L. (2007). Systematic Planning for ICT Integration in Topic Learning. *Journal of Educational Technology & Society, 10 (1): 148-156*.

Webb, E. K. (1998). Managing licensed network electronic resources in a University Library. *Information Technology and Libraries 3(4): 92-112.*

Williams, K. (2003). Literacy and computer literacy: Analysing the NRC's being fluent with information technology. *The Journal of Literacy and Technology, 3* (1).

Williams, M. D., Rana, N. P.,&Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology (UTAUT): A literature review, *Journal of Enterprise Information Management*, 28 (3), 443 – 488.

Wimmer, R.D.,& Dominick, J.R. (2006). Broadcast Media Research: An introduction. (EightEdition). Boston: Wadsworth, Cengage Learning.

Wong, A. F., Quek, C.L., Divaharan, S., Liu, W. C., Peer, J., & Williams, M. D. (2006). Singapore Students' and Teachers' Perceptions of Computer Supported Project Work Classroom Learning Environments. *Journal of Research on Technology in Education*, 38 (4), 449-479.

Wolff, L. (2002). The African Virtual University: The Challenge of Higher Education Development in Sub-Saharan Africa, TechKnowLogia.*International Journal of Technologies for the Advancement of Knowledgeand Learning*, 4, (2), 170-192.

World Bank (2003). The African Virtual University and Growth in Africa. A knowledge and learning challenge. Retrieved 17/08/2015 from http://www.worldbank.org/afr/findings

World Bank (2002). "Information and Communication Technologies, A World Bank Group Strategy", The World Bank Group, Washington D.C.

Yusuf, M. O. (2005). Information and communication technology and education. Analyzing the Nigerian National Policy for Information Technology. *International Journal of Education*, *6*(3), 316-321.

Yusuf, M. O., &Onasanya, S. A. (2004). Information and Communication Technology (ICT) and Teaching In Tertiary Institutions. *Nigeria Journal of Computer Literacy, 4 (1).*

Appendices