

**ASSESSMENT OF LECTURERS' ICT COMPETENCIES IN THE USE  
OF ELECTRONIC INFORMATION RESOURCES FOR TEACHING AND  
RESEARCH IN UNIVERSITIES IN BENUE STATE, NIGERIA**

**BY**

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ZARIA, NIGERIA**

**JANUARY, 2020**

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P16EDLS8163**

**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES  
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**DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE,  
FACULTY OF EDUCATION,  
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ZARIA, NIGERIA**

**JANUARY, 202**

## **DECLARATION**

I declare that this dissertation titled: “Assessment of Lecturers’ ICT Competencies in the Use of Electronic Information Resources for Teaching and Research in Universities in Benue State, Nigeria” has been written by me in the Department of Library and Information Science, Ahmadu Bello University, Zaria. 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.

**TOR SHIEKUMA FELIX** \_\_\_\_\_  
Signature Date



## **DEDICATION**

To my late father, David Tyokosu Orya, who bore the pains of setting a firm footing of my education when I was ignorant of what is good for my life.

To my mother, Hannah Msonga Tyokosu, who continued with the good work in the midst of hurdles without dragging her feet.

To my siblings who spared nothing but released all to ensure that I see the very finishing line.

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## ABSTRACT

This research was carried out to assess Lecturers' ICT Competencies in the Use of Electronic Information Resources for Teaching and Research in the Universities in Benue State. The study was guided by five research objectives: to identify types of electronic information resources available in the universities, find out means through which lecturers acquire ICT competencies, determine the level of ICT competencies of lecturers, ascertain the extent to which lecturers apply ICT competencies, and identify challenges faced by the lecturers in applying ICT competencies for using Electronic Information Resources for teaching and research in the Universities in Benue State. The quantitative research method was preferred for the study while a cross-sectional survey research design was adopted. The targeted population was lecturers in the three full-time universities in Benue State; namely, University of Agriculture, Makurdi; Benue State University, Makurdi; and University of Mkar, Mkar, with a total of 1, 537 lecturers. Out of this population, 306 lecturers were drawn as sample for the study. Cluster and simple random sampling were preferred for sample selection. Questionnaire was used as the instrument for data collection. In order to establish the validity of the instrument, the questionnaire was presented to experts for face and content validity, and the reliability of the instrument was obtained through the pilot study conducted in Ahmadu Bello University, Zaria. A reliability level of 0.98 was obtained. The data collected from the respondents was sorted, organized, presented and analyzed using descriptive statistics for the research questions while inferential statistics in form of One-way Analysis of Variance (ANOVA) was maximized in testing the two null hypotheses at 0.05 level of significance, with the aid of SPSS. The study revealed that electronic journals, online databases, e-books and e-reference sources are available in the universities in Benue State; friends/family/colleagues, private computer training, computer-assisted instructions, Internet/distance learning, and Workshops/Seminars/Conferences are the means through which lecturers in the universities in Benue State acquire ICT competencies; the lecturers in the universities in Benue State possessed basic and intermediate levels of ICT competencies such as wordprocessing, presentation (PowerPoint), spreadsheet (excel), Internet surfing and database searching; the extent to which lecturers in universities in Benue State apply ICT competencies in using electronic information resources stand at average. The challenges that confront lecturers in applying ICT competencies for electronic information resources usage are unstable power supply, inadequate ICT facilities, poor Internet connectivity, lack of ICT training and funds. The first null hypothesis was rejected since it revealed that there is a statistically significant difference ( $p = .013$ ) in the level of ICT competencies of lecturers in the federal, state and private universities in Benue State. The second null hypothesis was retained since it uncovered that there is no statistically significant difference ( $p = .123$ ) in the extent of applying ICT competencies by lecturers in the federal, state and private universities in Benue State. Based on the findings, it was recommended that the management of respective university libraries in Benue State should work toward developing Digital Institutional Repositories (DIR) for their institutions. This would provide sustainable access to relevant scholarly outputs in addition to the available ones. Professional librarians who are ICT inclined should offer more personalized support services to lecturers that need training in ICT to be able to use electronic information resources for quality teaching and research. Government at both federal and state levels should show more commitment to the development of ICT competencies of lecturers by making available ICT grants to the universities and lecturers on annual basis.

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## LIST OF ABBREVIATIONS

ACV	-	Ajayi Crowther University
AGORA	-	Access to Global Online Resources in Agriculture
AJO	-	African Journals Online
ANOVA	-	Analysis of Variance
BSUM	-	Benue State University, Makurdi
CAI	-	Computer Aided Instruction
CD-ROM	-	Compact Disk Read Only Memory
DIAC	-	Dubai International Academic City
DIR	-	Digital Institutional Repository
EIFL.NET	-	Electronic Information for Libraries' Network
EIRS	-	Electronic Information Resources
ERIC	-	The Education Resources Information Center
ETF	-	Educational Trust Fund
HINARI	-	Health Inter Network Access to Research Initiative
HTML	-	Hyper-Text Mark-up Language
ICOLC	-	International Coalition of Library Consortia
ICT	-	Information and Communication Technology
ILL	-	Inter-Library Loan
INTERNET	-	International Network
IT	-	Information Technology
IFLA	-	International Federation of Library Associations

LCU	-	Lead City University		
NCC	-	Nigerian Communications Commission		
NOUN	-	National Open University of Nigeria		
NUC	-	National Universities Commission		
OARE	-	Online Access to Research in the Environment		
OER	-	Open Educational Resources		
OPAC	-	Online Public Access Catalogue		
OSIWA	-	Open Society Initiative for West Africa		
PDF	-	Portable Display Format		
SPSS	-	Statistical Package for Social Science		
TETFUND	-	Tertiary Education Trust Fund		
TVE	-	Technical and Vocational Education		
UAM	-	University of Agriculture, Makurdi		
UMM	-	University of Mkar, Mkar		
UNESCO	-	United Nations Educational, Scientific and Cultural Organization		
UNICEF	-	United Nations International Children's Emergency Fund		
VSAT	-	Very Small Aperture Terminal		
WEBPAC	-	Web Public Access Catalogues		
WWW	-	World	Wide	Web

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Information and Communication Technology (ICT) is a potent force that has globally transformed various facets of human endeavors. Basri, Alandejani, and Almadani (2018) admitted that ICT has become an important source of innovation and improvement of efficiency for many sectors across the globe. In the education sector, particularly, the application of ICT has widened the opportunities for lecturers around the world to acquire information, interact, network and actively participate in the academic world. In Nigeria, the impact of ICT is fast spreading, compelling technological changes and creating a culture of reliance on technology (Edewor, Imhonopi & Urim, 2014). This development has influenced the mode of information searching patterns of lecturers in universities and offer the newest and enhanced ways of using varied scholarly information for teaching and research.

ICT is a generic term that combines computer and communication technologies used in information handling. Jagadesh (2017) defined ICT as a “diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information”. It covers products that will be able to store, manipulate, retrieve, transmit and at the same time receive information (text, sound, motion, etc.) transmitted electronically in digital form. Some of these products include computer hardware and software, the network (Internet, intranets, extranets), World Wide Web (WWW) and other digital devices like audio, video, and camera and so on. Nwizeg, Chukwunons, Kpabeb, and Mmeh (2011) stated that ICT tools can be used to find, explore, analyze, exchange and present information responsibly from unlimited sources and without discrimination. This makes ICT instrumental in the intellectual system of universities.

In recognition of the import of ICT in the university system, the Federal Government of Nigeria through the National Universities Commission (NUC), the Tertiary Education Trust Fund (TETFund) as well as individual universities' efforts, has made ICT facilities available in university libraries (Ojiegbe, 2010). University Libraries in Benue State is not an exemption. With the presence of ICTs in most of the university libraries in Nigeria, a considerable amount of money of the university libraries' budgetary allocation is now expended on subscription to EIRs, which is the derivative of ICT in order to supply lecturers with resources needed to fulfill their teaching and research mandate.

Electronic Information Resources (EIRs) are a global phenomenon that has gained growing attention in the academic circle around the world. These resources have universally brought about tremendous changes in scientific and scholarly communication (Chibini, 2011). The traditional barrier of geographical location and time have been stamped out with the advent of electronic information resources, thus enhancing intellectual interaction and global information access among academicians of both developed and developing nations of the world. Bassey and Odu (2015) confessed that this development has ushered in a global facilitation of access to information through the use of computers, the Internet, the World Wide Web, and the networked environments.

In Nigeria, Electronic Information Resources have dramatically revolutionized the landscape of teaching and research in universities. Owolabi, Ajiboye, Lawal, and Okpeh (2012) observed that EIRs have increasingly become an invaluable asset among Universities in Nigeria. Thus, university libraries which are burdened with the onus of supporting the objectives of universities with information resources and services, have bowed to this revolutionary change by switching largely from building collections to providing access to Electronic Information Resources. This

paradigm shift, according to Ojeniyi and Adetimirin (2016) has overcome the barrier of access to valuable information experienced by scholars in the developing nations of the world.

In common parlance, Electronic Information Resources are information objects available in a non-paper format and are accessed through electronic means. Ani, Ngulube and Onyancha (2015) defined electronic information resources as “information that is accessible through ICT facilities such as computers, CD-ROMs, the Internet, and other digital networks”. These resources according to Akpojotor (2016) and Iroaganachi and Izuagbe (2018) consist of e-journals, e-books, e-databases, e-theses and dissertations, Online Public Access Catalogues (OPAC), Internet, Web Public Access Catalogues (Web PAC), CD-ROM, e-magazines, e-newspaper, e-bibliographic databases, e-reference sources and related sources that are valuable to lecturers in the university libraries. They are easily accessible through libraries’ in-house database carriers such as discs/disks, cassettes, cartridges and so on or from remote areas via the Internet.

The Internet is the most facilitating and powerful tool in this contemporary knowledge-based society in promoting the use of Electronic Information Resources. Tiemo (2016) stated that the Internet has made it possible for libraries to have access to electronic information resources regardless of their physical scene. This justifies why Internet access exploded in popularity in most university libraries in Nigeria. According to the Nigerian Communications Commission (NCC), Internet usage in Nigeria has grown to 122 million users as of July 2019. This indicates the current penetration of the Internet in Nigeria and implied the extent of infiltration of EIRs in Universities in Nigeria.

Electronic information resources are very instrumental for driving universities, seeing that they complement print-based resources by affording lecturers opportunity to access and utilize a wide range of accurate and timely scholarly information on various subjects. According to Tekale and

Dalve (2012) as cited in Edemand Egbe (2016), the benefits of Electronic Information Resources include their “availability at any time of the day; hyperlinks to other resources; huge information reservoirs; various search options; easy citations; ease in uploading and updating; ease in storage and dissemination; flexibility; and ease of archiving”. Users become more accustomed to technology through constant use of EIRs, thus liquidating technophobia. The educational potentials of these resources, when effectively utilized, impact the productivity of university lecturers.

Use is the searching, examining, accessing and putting these electronic information resources into appropriate context in order to satisfy teaching and research information needs. Iroaganachi and Izuagbe (2018) understood the use of electronic information resources as a way of exploiting information on the varied field which has been accessed for meeting the desired need of lecturers beneficially. They stated further that for any electronic information to be utilized, it must be relevant to the need of the user; thus, the use of EIRs by lecturers is influenced by their jobs, profession or functions they perform. Moreover, the use of EIRs hinges on the availability of computers, Internet access, network connectivity, highly skilled personnel and steady power supply (Simon & Ogom, 2015). Without these elements, the effective use of EIRs would not be achieved until the variables are properly harnessed.

Effective utilization of EIRs is crucial to successful teaching and research. It enables lecturers to achieve self-education growth, development of curriculum and improve their research performance (Okiki 2012; Olarongbe & Ibrahim, 2013; Aniet *al.*, 2015). In order to facilitate the use of Electronic Information Resources, National Universities Commission (NUC) subscribed to a number of international and local journals and made them accessible to Nigerian Universities on the Internet for use by lecturers. Moreover, the validation of National Policy on Open

Educational Resources formulated by the National Universities Commission (NUC) in 2017, became a landmark feat that brought more e-resources to visibility in Nigerian universities. However, ICT competencies are inescapable requirements for deriving maximum benefits from electronic information resources available to lecturers.

ICT competencies in modern times is not a negotiable subject because real success in today's rapidly changing and highly competitive world depends on ICT knowledge and skills (Kpolovie & Awusaku, 2016). This is a clear pointer that the age of lecturers surviving and proving to be relevant without ICT competencies is gone. Buabeng-Andoh (2012) defined ICT competencies as being able to handle a wide range of varying computer applications for various purposes. It is the capability of lecturers to effectively integrate ICT tools in using electronic information resources for teaching and research. It enhances personal, career and organizational development. All lecturers need these competencies to be able to use ICTs for research development and effective teaching. Ayoku and Victoria (2015) highlighted emailing, word processing, formatting, Internet and database searching, database management, web design as some of the ICT competencies.

In the university, the core responsibilities of lecturers as captured in the National Policy on Education (2004) is teaching and research. This is more so because research and teaching are the *sine qua non* for knowledge acquisition and transmission, which individuals and nations depend largely on for sustainable growth and development. In order to accomplish these responsibilities efficiently, lecturers require competencies in ICT so as to use electronic information resources that improve research and teaching productivity. However, Agber and Agwu (2013) reported that several problems still exist challenging the effective use of these resources by lecturers. Some of the challenges, among others, according to the authors included unstable power supply, high cost

of access and usage of online resources, non- subscription for relevant online resources by institutions, slow connection to the internet and lack of sponsored training from institutions. It is against this backdrop, that the researcher was spurred to conduct this research to establish lecturers' ICT competencies in using electronic information resources in universities in Benue State

### **1.1.1 Universities in Benue State**

Benue State has four licensed Universities; namely: University of Agriculture, Makurdi; Benue State University, Makurdi; University of Mkar, Mkar; and National Open University, Makurdi Study Center (NUC, 2018).

University of Agriculture, Makurdi was established on 1st January 1988 and has undergone several changes. It is an institutional player in the process of national and global human resource capacity building in agriculture, science, engineering and technology (ASET) for rapid economic growth. Presently, the automation of the Library services is in full bloom, progress with the digitalization of certain databases in agriculture and offline materials and other downloaded materials are available for easy access. The Library has also subscribed to Very Small Aperture Terminal (VSAT) Internet services to allow lecturers search various catalogs worldwide through Google, Yahoo, Mama, Mozilla Firefox and others (UAM, 2018.)

Benue State University, Makurdi, was established in 1992. The University has made laudable progress in ICT by making available installed digital access and infrastructure with a network of computers, a server, VSAT equipment, and high-speed Internet connectivity. There is a new VSAT also in the library. This is done to ensure access and use of subscribed electronic information resources by lecturers and to ensure improved library services on the part of the library staff. The facility was obtained in partnership with the Open Society Initiative for West

Africa (OSIWA) who trained Benue State University Library staff on networking (BSU Brief History, 2015).

The University of Mkar was founded in June 2005 by the Universal Reformed Church of Christ (URCC). It is one of the private Christian Universities that is committed to the advancement of knowledge through quality teaching, research and holistic education that puts God at the center of all learning. As a Christian Institution, academic intellectualism in all its forms is viewed as man's study of the created facts of God. It has a computerized library with an open access system audiovisual rooms with Internet and other ICT facilities to enable lecturers to access online resources (UMM, 2018).

National Open University (NOUN), Makurdi Study Center is an open distance learning institution renowned for providing functional, flexible, accessible, cost-effective education adequate for flourishing in the 21st century and beyond. NOUN leverages on Information and Computer Technologies to deliver an education tailored towards the globalized economy. The University offers exceptional academic programs that meet the specific needs of all sectors of the global economy, in the Arts; Health; Law; Physical, Social, Agricultural and Management Sciences (NOUN, 2019). The institution has lecturers known as facilitators.

## **1.2 Statement of the Problem**

Electronic information resources constitute one among the global sources of information being tapped by nations of the world and individuals in order to meet the growing need for national development and growth. ICTs are modern time vehicles that are being used to harness these resources. ICT competencies exhibited by lecturers in the use of electronic information resources enable them to compete for standard in teaching and research process with their

contemporaries across the world. It also increases their job effectiveness and efficiency and upsurge their relevance through intellectual contributions to the academic world.

However, the preliminary investigation undertaken by the researcher through literature search and observations revealed the low usage of electronic information resources by lecturers in the Universities in Benue State. Similarly, a growing body of researches confirmed low level of electronic information resources use by the lecturers (Ukih, 2011; Ashaver, 2012; Agber and Agwu, 2013), despite the fact that visibility of ICT has been reported in these universities (Shidi, 2011; Shidi, Igyuve and Tyonum, 2015). Therefore, uncertainty exists whether the lecturers indeed possess ICT competencies required for using electronic information resources. Where these competencies are lacking, the institutions in question cannot gain commensurate value for the resources invested in procuring ICT facilities and subscribing to EIRs as a consequence of nominal patronage and ultimately, the teaching and research mission of these universities might well remain in doldrums.

In order to remedy this, the need for this study heightens, to keenly assess the ICT competencies of lecturers in the use of electronic information resources in the universities in Benue State, Nigeria. This is to ensure that opportunities and benefits presented by EIRs as a result of the advent of ICT are fully exploited for effective and efficient teaching and research by lecturers.

### **1.3 Research Questions**

The study sought to answer the following questions:

1. What types of Electronic Information Resources are available to use for teaching and research by lecturers in the universities in Benue State?
2. What are the means through which the lecturers acquire ICT competencies for using Electronic Information Resources for teaching and research in universities in Benue State?

3. What is the level of ICT competencies possessed by the lecturers for using Electronic Information Resources for teaching and research in universities in Benue State?
4. To what extent do the lecturers demonstrate ICT competencies in using Electronic Information Resources for teaching and research in universities in Benue State?
5. What are the challenges faced by the lecturers in applying ICT competencies for using Electronic Information Resources for teaching and research in universities in Benue State?

#### **1.4 Research Hypotheses**

The following null hypotheses have been formulated for the study:

**H<sub>01</sub>:** There is no significant difference in the level of ICT competencies possessed by the lecturers in using EIRs for teaching and research in the Federal, State and Private Universities in Benue State.

**H<sub>02</sub>:** There is no significant difference in the extent of applying ICT competencies in using EIR for teaching and research by the lecturers in the Federal, State and Private Universities in Benue State.

#### **1.5 Objectives of the Study**

The objectives of the study are to:

1. Identify types of Electronic Information Resources available to use for teaching and research by lecturers in the universities in Benue State.
2. Find out the means through which the lecturers acquire ICT competencies for using Electronic Information Resources for teaching and research in universities in Benue State.

3. Determine the level of ICT competencies possessed by the lecturers for using Electronic Information Resources for teaching and research in universities in Benue State.
4. Ascertain the extent to which the lecturers apply ICT competencies in using Electronic Information Resources for teaching and research in universities in Benue State.
5. Identify the challenges faced by the lecturers in applying ICT competencies for using Electronic Information Resources for teaching and research in Universities in Benue State.

### **1.6 Significance of the Study**

It is expected that upon completion of this research work, the findings of this study would expose lecturers to ICT competencies to possess in order to utilize electronic resources and perform superlatively in teaching and research. It would motivate and inspire them to aspire beyond the status quo and make haste to acquire the required proficiencies to ensure academic interaction with their counterparts across the globe and meet up with the demands occasioned by globalization.

It is hoped that the discoveries emanating from this study would help university librarians to design or redesign programs, services, and resources that will capture the emerging needs of lecturers in universities. It would also propel them to put in place strategies on how to specifically train and empower them with the required skills to enhance their job performance.

The management of the universities would be motivated by the submissions of this study to initiate standard and consistent training programs that would equip, nurture and develop lecturers with competencies needed to utilize electronic information resources. This would eventually contribute to universities development, career advancement, and improved academic activities.

Similarly, it is also hoped that the findings of this study will prompt management of tertiary institutions in Benue State, in particular, and Nigerian in general, to formulate feasible policies that would enhance the training of lecturers to effectively access and use the Internet and the resources its host for their academic works.

The finding arising from this study would also give educators in library schools insight on how to redirect their training from only inculcating traditional skills in students to training ICT friendly graduates who will fit into the technology-driven university system when employed as lecturers and display a high level of proficiency amidst their equals in the outside world.

Curriculum developers or planners of Library and Information Science will see the necessity, as a result of this study, to incorporate more practical ICT competencies development programs in the course content of the profession. This is to ensure that students who will eventually become lecturers pass through the requisite ICT trainings at the early stage of their careers.

The result of this study would equally expose the need for the Nigerian Library Association (NLA) and Librarian Registration Council of Nigeria (LRCN) to be regularly organizing capacity building programs for professionals in universities. This would ensure the continuing education of professionals.

Finally, it would contribute to the existing body of knowledge in the area of Library and Information Science and serves as a stepping stone for further researches in the area. It would also contribute to the paucity of literature on ICT competencies of lecturers in the Universities in Benue State.

### **1.7 Scope of the Study**

The study centred on lecturers' ICT competencies in the use of electronic information resources for teaching and research in the universities in Benue State; namely, University of Agriculture,

Makurdi; National Open University, Makurdi Study Center; Benue State University, Makurdi; and University of Mkar, Mkar. The study covered only lecturers in the three full-time or conventional universities in Benue State with their level of ICT knowledge and skills (competencies) applied in putting EIRs to use to improve teaching and research functions. This is because lecturers form the greater percentage of valuable human resources in the educational systems and are very sensitive to the realization of the overall objectives of the universities. ICT competencies exhibited in the use of electronic information resources by the lecturers will enhance their intellectual capacity, enable them to impart contemporary knowledge to students and conduct researches that will gain esteem in the global research community, which is what universities principally stand for. The study is limited in Benue state for convenience in data collection.

### **1.8 Operational Definition of Terms**

The following terms are operationally defined as follows:

**Assessment:** It involves measuring the level of ICT knowledge and skills (competencies) possessed by lecturers using Akoojee, Arends and Roodt (2008) proposed levels of ICT competencies for developing countries with slight modifications.

**Electronic Information Resources:** These are information carriers available in a non-paper format and are accessed through electronic means for use by lecturers.

**ICT Competencies:** These are knowledge and skills that enable lecturers to effectively integrate ICT tools into the productive use of electronic information resources. Competencies and skills are used interchangeably in this work.

**Lecturers:** These are university teachers who are provided with electronic information resources to use for effective teaching and research. Academic staff, university teachers and faculty members are used interchangeably in this work.

**Research:** This involves a systematic way of studying a problem or phenomena using data provided by Electronic Information Resources in order to arrive at a dependable conclusion.

**Teaching:** This involves the process of effectively imparting knowledge by lecturers to learners with the aid of information gathered from Electronic Information Resources.

**Use:** It involves searching, examining and accessing electronic information resources in all formats in order to satisfy the teaching and research information needs of lecturers. Use, application and utilization are synonymously used in this work.

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## CHAPTER TWO

### REVIEW OF RELATED LITERATURE

#### 2.1 Introduction

This chapter is meant to review literature considered relevant and related to ICT competencies of lecturers in the use of Electronic Information Resources. The purpose of undertaking this review

is to allow the researcher to establish his study within the mainstream of other existing ones. To achieve this, the review is presented under the following headings:

2.2 Conceptual Clarifications

2.3 Theoretical Framework

2.4 Types of Electronic Information Resources

2.5 Means of Acquiring ICT Competencies by Lecturers

2.6 Levels of ICT Competencies Possessed by Lecturers

2.7 The Extent of Applying ICT Competencies by Lecturers

2.8 Challenges in Applying ICT Competencies for Use of EIRs by Lecturers

2.9 Review of Empirical Studies

2.10 Summary of the Review

## **2.2 Conceptual Clarifications**

### **2.2.1 Concept of Electronic Information Resources (EIRs)**

The term Electronic Information Resources has been called variously by researchers, scholars, and authors as digital resources, Internet resources, open educational resources, network resources, computer resources, online services, online facilities, electronic information sources or e-library resources (Organization for Economic Cooperation and Development (OECD, 2007), Issa, Amusan & Daura, 2009; Okiki & Asiru, 2011). But for the purpose of consistency and clarity, this present study used electronic information resources to represent all information accessed via the Internet or through local networked resources.

#### **2.2.1.1 Definition of Electronic Information Resources (EIRs)**

Electronic information resources are digital representation of information which can be accessed via the electronic system and computer network (Johnson, Evensen, Gelfand, Lammers, Sipe &

Zilper, 2012). Similarly, Agber and Agwu (2013) viewed EIRs as “those resources that are found on computer networks of organizations (Intranets) or on the global network of millions of computers (Internet)”. Konappa (2014) on his part considered EIRs as “materials that require computer access, whether through a personal computer, mainframe, or handheld mobile device”. Additionally, Ani *et al.*, (2015) defined EIRs as information stored in electronic format in a computer or computer-related facility (CD-ROMs, digital libraries or the Internet)”. Concisely, the International Federation of Library Associations (IFLA, 2015) defined EIRs as materials that are computer-controlled, including materials that require the use of peripherals connected to a computer.

Arising from the above definitions, it is healthy to state that EIRs are presented, stored and accessed electronically. This implies that they are the replica of print resources in content but dissimilar in format and require apposite electronic systems and network connectivity to be accessed. In the context of this study, the definition of EIRs according to Jewel (2010) is considered more relevant and comprehensive. He perceived EIRs as data (information representing numbers, text, graphics, images, maps, moving images, music, sounds and so on), programs (instructions that process the data for use), or combinations of data and programs in a digital format. He has drawn attention to Electronic Information Resources as not only limited to text and images, they also include audio, video and programs that are either generated digitally or converted from other forms into machine-readable format. This study has addressed Electronic Information Resources from all these encompassing angles because of their educational value.

### **2.2.1.2 Nature and Characteristics of Electronic Information Resources (EIRs)**

Electronic Information Resources could be of varied nature, Konappa (2014) comprehensively categorized them as follows: *primary sources of information* (e-conferences, software, courseware, manuals, e-thesis and dissertation, reports, news, manuals, electronic journals and the like); *databases, data sets and other collections* (indexing and abstracting databases, digital collections comprising images, audio, video; scientific data set comprising numeric, properties, structural databases; virtual libraries; library catalogues; museums and archives and so on); *electronic books* (NetLibrary; <http://www.ntlibrary.com>, Ebrary; <http://www.ebrary.com> etc.); *reference sources* (e-dictionaries, e-biographies); *organizations and People* (information about Organizations and people such as directories of people) and *meta Resources* (facilitate access to network-based resources e.g. subject gateways, pathfinders and so on). However, this categorization, from my standpoint, fails to take care of materials that are converted from other formats to digital form and institutional repositories, which are also vital in enriching the intellectual system of universities.

Electronic Information Resources are both data-based (numbers, letters, graphics, images, and sound or a combination thereof) and programs based (instructions for processing data) (Haridasan & Khan, 2009; Sejane, 2017). They are modified by the computer (Thanuskodi, 2012; Pawar & Moghe, 2014). This is the major selling point of EIRs. In another view, Islam and Mostofa (2013) characterized EIRs as being either born-digital or digitalized. Born digital are materials available on the Internet and CD-ROMs whereas digitized materials are converted from other formats to digital formats. In regard to the method of access, Shidi and Uganneya (2013) factually submitted that EIRs are either accessed freely under the Open Access Initiatives or subscribed to (propriety) from commercial vendors. EIRs have economic value but propriety resources restrict people from largely benefiting from intellectual outputs of others.

Moreover, according to Dongardive (2015), EIRs have printing and downloading features, multimedia capabilities and hypertext and hypermedia formats that enable linkages within or among articles. These features make EIR user-friendly, aid use and prove its advantage over print resources. Such collections can either be accessed online (Internet) or offline (domiciled in storage devices) (Iroaganachi & Roland, 2018). However, the features of EIRs fail to acknowledge EIRs as not standalone resources. Electronic Information Resources content requires a human component to be created and maintained with the help of ICTs, and the rich benefits can only be tapped by electronic friendly users.

### **2.2.1.3 Impact of Electronic Information Resources on Universities**

Electronic Information Resources have impacted universities both positively and negatively. Electronic Information Resources play vital roles in helping libraries in their quest to support the teaching and research process at the university level and to provide quality assistance to its users (Omosekejimi, Eghworo & Ogo, 2015). In addition, Acanit (2016) admitted that electronic access to information supported by ICTs has transformed libraries from traditional to digital. The beauty of this is such that the space requirement for EIRs is less as compared to paper-based resources. Therefore, EIRs are now highly valuable teaching and research tools, which complement print-based resources and enhance teaching and research in universities (Dadzie, 2005; Iroaganachi, 2016). Due to their consequentiality, Omotunde (2017) esteemed them as constituting a significant investment in many university libraries. If lecturers are not maximally exploiting EIRs, universities' investment in this aspect is partially profitable.

Furthermore, Iroaganachi and Izuagbe (2018) voiced that universities justify their existence, make their presence felt on a global scale and maintain relevance in the digital era by subscribing to EIRs to support research endeavors of lecturers. Universities' relevance will be much felt

globally if their concerted effort takes them beyond subscription to EIRs, to ensuring their consistent use by all that motivated the subscription.

From the above submissions, pieces of literature have highlighted that universities in Nigeria, in general, and Benue State, to be precise, were not exempted from the global transformation EIRs have wrought in tertiary institutions around the globe. However, Kaushik and Narayan (2016) reported hardware and software compatibility issues, copyright concerns, high infrastructure and installation cost as some of the negative impacts of EIRs on universities. These challenges can be largely addressed if university libraries seek improvement over these ugly situations, without condoning what constitutes a threat to their relevance.

### **2.2.2 Concept of Information and Communication Technology (ICT)**

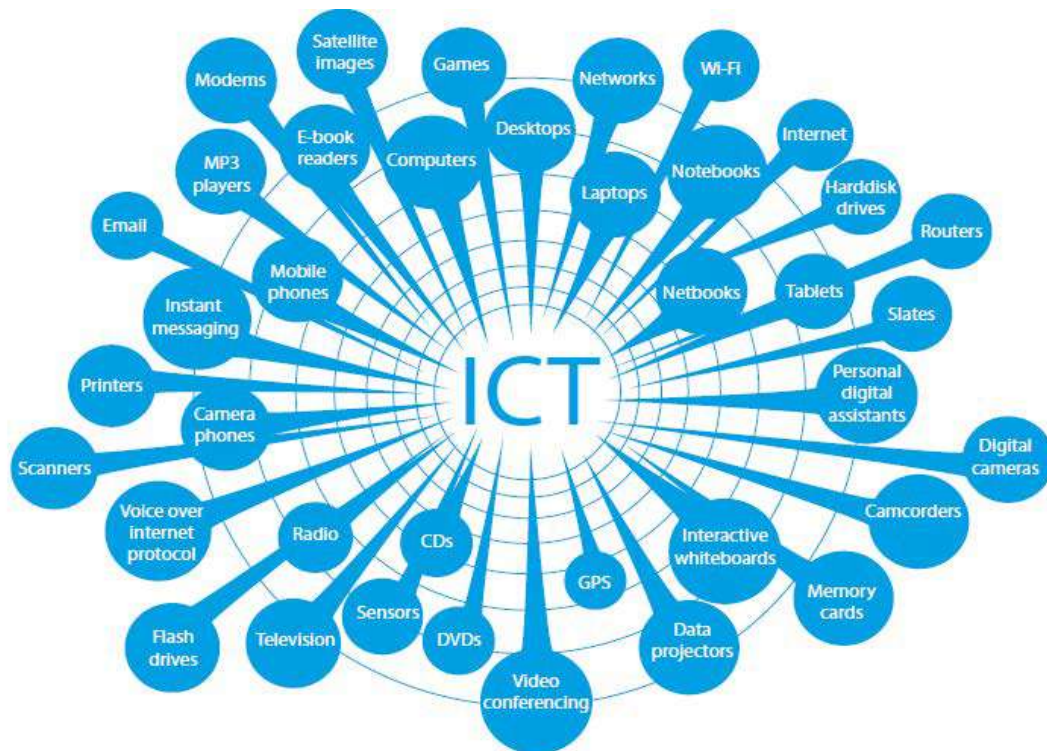
It is very difficult to define ICT because the definition keeps changing in order to accommodate new innovations experienced in the ICT world. Notwithstanding, Qutab, Bhatt, and Ullah (2014) defined ICT as a “term used to express the hardware and software usability for information transportation and conducting communications linked by a vast array of technological protocols”. From Qutab’s opinion, ICT is not a solo technology, it involves connections of several technologies for the purpose of information transfer and communication. More comprehensively, Fagbe, Amanze and Oladipo (2015) described ICT as a “broad-based term comprising the gathering (acquisition), organization (packaging), storage and retrieval (dissemination) of information that can be in textual or numerical (books, documents), vocal and pictorial forms (audiovisual) or a combination of all the above (multimedia), using a combination of computer and telecommunications devices”. On the other hand, Kpolovie and Awusaku (2016) looked at ICT as “computer-centred tools adopted by individuals to meet the information

processing needs of an organization”. It consists of a diverse but cohesive set of computer-associated technologies used in handling information from generation to ultimate dissemination.

Fagbe *et al's.*(2015) the definition is considered apter and suitable for this study because they extended the scope of ICT from just technological mark-up to various formats into which information is translated. This indicates that ICTs are the carriers of EIRs and access and effective use of these resources in their varied formats is harnessed by Information and Communication Technologies (ICTs).

Examples of ICTs according to Jagadesh (2017) are expansively presented in Figure 2.1:

Fig. 1. Examples of Information and Communication Technologies (ICTs)



Information and Communication Technology (ICT), according to Yusuf, Afolabi, and Loto (2013) is an indispensable part of the contemporary world. The emergence of the ICT revolution has dramatically changed the way people think, work and communicate in the 21<sup>st</sup> century.

Waghmare and Salved (2014) responded that ICT has transformed the higher education scenario

and the operations of university libraries. Improved services of university libraries are the by-product of this drastic transformation. Also, ICT has tremendously broadened the opportunities for people to acquire information, interact, network, address issues of common concern, generate income and participate in society (Oladipo & Akinwunmi, 2015). As a result, electronic information resources have exploded in popularity and use. According to Isibika and Kavishe (2018), EIRs are now considered important tools for study, teaching and research in any academic institution. University libraries are therefore deploying ICTs to facilitate access to these resources because lecturers largely depend on them for academic purposes.

#### **2.2.2.1 ICT Adoption and Use in Nigerian Universities**

In Nigeria, according to Aina, Adigun, and Ogundipe (2010), there has been dramatic adoption of ICTs in libraries (university libraries inclusive) and this has led to the globalization of library services in the country. In agreement, Odionye (2016) declared that Nigerian university has recognized the importance of ICTs in reforming its library. Universities can also recognize the importance of training lecturers in the use of ICT after adoption in order to transform their academic experience. Specifically, Aliyu (2015) reported that applause has to be ascribed to the World Bank for the presence of ICTs in the Nigerian universities. Besides, the Federal government of Nigeria through the National Universities Commission (NUC), the Tertiary Education Trust Fund (TETFund), including individual universities' efforts, have made ICT facilities available in university libraries in Nigeria (Ojiegbe, 2010; Ezeugwu, Abiogu, Ibeh, Asogwa, Nwangwu & Afufu, 2016). Also, as part of its corporate social responsibility, the MTN Foundation through its Universities' Connect committed resources to the technological innovation of universities like Ahmadu Bello University, Zaria; University of Nigeria, Nsukka; and the University of Lagos, all in Nigeria (Ibrahim, 2014; Ugwu & Orsu, 2017). The

educational system of Nigeria would be more effective and promising if such efforts are sustained.

In view of the advances reported above in the area of ICT adoption, it can be inferred that ICT is increasingly gaining visibility in universities in Nigeria. This conveyed an improvement over the claims of Nweke (2006), who pointed generally, without reference to particular institutions, that many tertiary institutions' libraries in Nigeria are not computerized, and are not Internet-connected, and where some ICT facilities exist they are zealously guarded. At the moment, Odionye (2016) observed that ICT has become a vital educational tool in Nigerian universities possibly because of its capacity in enhancing the teaching and research process. Also, the presence of the Internet in universities facilitates resource sharing and makes access to digitalized information feasible (Odionye, 2016; Enakrire & Ocholla, 2017). This was impossible in the dark days when information could not be accessed remotely.

However, Owolabi, Oyewole and Oke (2013) detailed that irrespective of praiseworthy support of the government and agencies in ICT deployment, Nigerian education sector generally falls behind in ICT, let alone universities. Inadequate training and retraining of staff by management; inadequate funding, epileptic power supply, lack of search skills, and poor ICT infrastructure were identified by researchers as the major factors militating against the effective deployment and use of ICT in Nigerian universities (Krubu and Asowaru 2010; Ugwuanyi, 2012; Ebinuwele, Ola & Uduebor, 2014). In another study, Fagbe *et al* (2015) identified people's negative attitude to change in technology, crashing of computers and improper maintenance culture as impediments to deployment and effective use of ICTs in Nigerian universities. This implies that effective use of EIRs would remain an unrealized goal if ICT tools that facilitate access to EIRs resources are not functionally available or scanty.

According to Kpolovie and Awusaku (2016) understanding the role ICT plays and how to personally make the best use of ICT is very essential. This understanding can surmount some of the challenges faced in ICT adoption and use due to the fact that ignorance of what ICT can do when utilized caused some of the problems reported in the situation of Nigerian universities. In his admonition, Musingarabwi (2017) said the ICT remains largely symbolic if the intellect of the human users in terms of skills and knowledge is not developed. This study is premised on assessing the ICT knowledge and skills of lecturers, who are a category of ICT users.

**2.2.2.2 Emerging Information and Communication Technologies (ICT) in Universities** According to Mittal (2017) the application of ICTs in universities and their libraries have given rise to new technologies. Knowledge of these emerging technologies is paramount to lecturers in order to avoid being backwards in the ICT world but reap from its manifold benefits to uplift and enhance the quality of education through research and teaching.

### **Web OPAC**

This technology has made it possible for information users to check the availability of any library material on the web without leaving the place. It tells users whether the required material is available or not. Access to its content is gained after logging in with username and password on the library website.

### **Web 3.0**

It is basically the use of robotics and artificial intelligence in two-way communication, first between humans and computers and second between humans and humans through computers (Waqar, 2015). According to Balbaid (2018) web 3.0 focuses on three main features:

- I. The ability to get context information through an online search.

- II. The ability to get information derived from various resources, applications, or advertisements.
- III. Engagement of all devices and sets in setting up and using data and communication process to reach our daily life and business.

Web 3.0 and its application would be instrumental in supporting universities and their libraries in developing services and rendering it to users in an enhanced fashion.

### **Cloud Computing**

Cloud computing is a kind of computing technology that facilitates the sharing of resources and services over the Internet rather than having these services and resources on local servers/ nodes or personal devices (Kaushik & Kumar, 2013). Cloud computing is not a new technology that suddenly appeared on the web but it is a new form of computing, they further stated. The combination of servers, networks, connection, applications and resources is defined as 'cloud'. Information technology services and resources are provided on a service basis. Cloud computing can be used to build digital libraries/repositories, web hosting, searching scholarly data and content, file storage, and library automation (Kaushik & Kumar, 2013).

### **Library Mobile Applications**

A mobile application, most commonly referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer (Techopedia, n.d) The current generation of smartphones technology has become as powerful as desktop computers of just a few years ago (Kurkovsky & Meesangnil, 2012). This is evidenced in the way people are spending more time on mobile apps and less time within mobile browsers (Paraschiv, 2017). In response to this, libraries are gradually embracing the idea of making their services available on mobile apps for better and faster services to university communities.Paraschiv (2017)

divulged that Apps offer functionalities such as a library catalogue, interactive library guides, a library virtual tour, loan and read electronic books and articles, reserve the library's resources or pay for some services. Therefore, Mobile apps can extend the library's services outside their physical borders and facilitate the interaction with patrons.

### **Web Conferencing and Webcasting**

Web conferencing is used to conduct live meetings, training, or presentations via the Internet. In a web conference, each participant sits at his or her own computer and is connected to other participants via the Internet (National Open University of Nigeria, 2009). This can be either a downloaded application on each of the attendees' computers or a web-based application where the attendees access the meeting by clicking on a link distributed by e-mail (meeting invitation) to enter the conference. A webcast is a media file distributed over the Internet using streaming media technology to distribute a single content source to many simultaneous listeners/viewers. A webcast may either be distributed live or on-demand. Essentially, webcasting is broadcasting over the Internet (NOUN, 2009). These technologies provide opportunities that universities in Nigeria can tap to achieve their learning, teaching and research objectives.

#### **2.2.2.3 Benefits of Information and Communication Technologies to University Lecturers**

Underlining the benefits of ICTs to lecturers, Danner and Pessu (2013) argued that adopting and applying ICT improves lecturers' teaching performance. Similarly, the use of ICTs by lecturers improves the process of obtaining and disseminating new information to students from multimedia technologies and the Internet (Mbengo, 2014). He additionally divulged that ICT brings greater access to knowledge, improve the archival capability of knowledge and ensure teaching effectiveness. Yoyo (2017) on his part joined up by stating that ICT helps in preparation of course materials, delivering and sharing contents; creation and delivery of presentation and

lectures and academic research. ICT is very sensitive to university lecturers because its blessing permeates every aspect of the lectureship. More expansively, Edworet *al* (2014) stated some benefits of ICTs as follows:

**PowerPoint:** Teaching is no longer about chalk and talk phenomenon. Classroom teaching is made possible through PowerPoint presentations which make teaching real and enhance teaching results.

**Email:** Academicians rely on email to sustain interaction and communication between and among them. Students are reached with academic questions through email and assignments are submitted through the same medium. It almost appears like a taboo for not having email in university settings.

**Collaborative research:** Academics living and working in far-flung areas can actually collaborate for research projects because of the borderless and distance-less nature of the Internet.

**E-conferencing:** Academicians confab through e-conferencing platform. E-interview is part of it. For example, Covenant University has begun to use the online interviews to engage the services of academics of Nigerian and foreign origins.

**E-learning tools:** These include online resources, tools, software and platforms that enable language teaching and learning within and outside the classroom. They include wikis, podcasting, blogs, e-groups, teleconferencing, webcasting, and several others.

**Online publishing:** ICTs have introduced online publishing with the advantage of open access publications which make it easy for scholars to access these pieces of information and profit thereby.

These benefits would remain a mirage to lecturers if their ICT competence is beggarly. Musingarabwi (2017) admonished that for lecturers to be able to adapt and competently

use these important technologies meaningfully, the availability of basic resources and facilities and their access to them must not be ignored.

### **2.2.3 Concept of Competencies**

Competencies are variously defined by authors and scholars. Ojiegbe (2010) defined competencies as applying the knowledge, skills, experience, and attributes necessary to carry out a defined function effectively. Competencies are better appreciated if applied to perform a given task. Dwivedi (2012) understood competencies as a learned behaviour. This implies that competence also involves learning; it does not happen completely arbitrarily. Okoye (2013) looked at competence as knowledge, understanding, skills, and attitudes to perform work effectively. It is the combination of several elements that amount to competence. In another view, the United Nations International Children's Emergency Fund (UNICEF, 2014) viewed competence as a package of behaviours that is necessary to deliver the benchmark outcomes. UNICEF's definition expunged "knowledge and skills" which are the technical necessities for an explicit work (Farooq, Ullah, Iqbal and Hussain, 2016) but emphasized that performance results should be commensurate with the set standard. In consenting, Farooq *et al* (2016) acceded that competence is measurable and can be evaluated against quantitative standards. Therefore, competence in this work is knowledge and skills that are learned, acquired and applied in performing a given task effectively and efficiently.

Researches have uncovered that competence is in categories. Asogwa (2014) categorized competencies into two: *personal* and *professional* competencies. *Personal competencies* involve lecturers' skills in the function, use, and ability of ICTs in supporting teaching and research while *professional competencies* involve lecturers' capability to perform the duties of their various professions according to the applicable professional and technical standards. This includes ICT

integration in the utilization of electronic information resources for teaching and research and other professional areas. These competencies are very fundamental for organizational success, personal performance and career development (Asogwa, 2014). Lecturers who possess both personal and professional competencies are likely to be more effective in teaching and research. This is because the combination of both types of competencies empowers lecturers to work adeptly in order to produce a benchmark result.

In observance of the cruciality of competencies, Umoru and Shaibu (2018) indicated that lecturers need the following competencies:

**Computer Competencies:** This has to do with the ability to use spreadsheets, excel, desktop publishing, Adobe Page Maker, CorelDraw/graphics in office automation processing. Ability to create a website through webpage design.

**Communication Competencies:** This constitutes the ability to compose clear and concise letters, punctuation, capitalization and numerical forms using both electronic and non-electronic means.

**Wordprocessing Competencies:** This includes the ability to use different Wordprocessing packages in creating different types of documents.

**Telecommunication Competencies:** This consists of the ability to send and receive an email, use computer networks, teleconferencing facilities and send and receive correspondence via mobile phones.

**Data Processing Competencies:** This involves the ability to apply basic processing methods and interpret computer printouts.

**Reprographic Competencies:** This includes the ability to access files, retrieve documents, operate electronic filing, indexing and cataloguing and apply the principle of electronic referencing.

**Planning, Organizing, and Decision-making Competencies:** This involves the ability to organize work to ensure efficiency; ability to supervise work and manage time and task; ability to suggest a modification to the system.

However, this study is concentrated on ICT Competencies only in order to avoid the temptation of deviating from the objective of investigating the Lecturers' ICT competencies in using electronic information resources.

### **2.3 Theoretical Framework**

A number of theories are germane to the study on ICT competencies of lecturers in the use of electronic information resources. However, the researcher adopted the principles of the Model of Adult Skill Acquisition and Diffusion of Innovation (DOI) theory to underpin the study.

#### **Model of Adult Skill Acquisition**

This model was developed by Dreyfus and Dreyfus in 1980. The model addresses how individuals acquire skills through external instruction and experience. Dreyfus and Dreyfus (1980) noted that skill in its minimal form is produced by following abstract formal rules, but that only experiences with concrete cases can account for high levels of performance. The experience of developing and mastering new skills takes an individual through several stages.

Therefore, the model articulates five distinct developmental stages: novice, advanced beginner, competent, proficient, and expert.

- 1. Novice Stage:** At this stage, the individual minimal knowledge and approach tasks mechanically. The task environment is decomposed into features such that the novice learner can understand without prior experience. The novice learner is then taught rules to respond to the features without exercising discretionary judgment. through feedback and self-observation, the learner improves and becomes proficient at applying rules to specific features.
- 2. Advanced Beginner Stage:** An individual at this stage begins to have a working understanding of key aspects of practice, and associated rules, facts, and knowledge to real situations.
- 3. Competent Stage:** The individual knows what needs to be done, continues to rely on rules and an analytical decision-making process, but experiences play an increasingly important role. The competent stage reflects problem-solving.
- 4. Proficient Stage:** At this stage, individuals exhibit a deep understanding, and see actions holistically, rather than as separation into parts. Individuals increase risk-taking and commitment to the outcome.
- 5. Expert Stage:** At this level, individuals have an authoritative or deep understanding of the skills they possess and implement. They no longer rely on rules and guidelines as reacting to the problem becomes intuitive (not analytical). Unconscious decisions and solutions are a feature of the expert stage. They are the primary sources of knowledge and information in any field.

## **Diffusion of Innovation Theory**

DOI theory was developed by E.M Rogers in 1982. It is one of the age-long social science theories. It was propounded to convey how, over time, an idea or product gains momentum and spreads through a particular social system or population. The outcome of the diffusion is that people, as a component of a social system, accept a new idea, behaviour or product which was previously unfamiliar to them. Diffusion can be possible if the idea or product is perceived novel or innovative (LaMorte, 2018).

Adoption of a novel idea or product does not happen in unison in a social system; rather it's a process whereby some are swifter to adopt the innovation than others (LaMorte, 2018). There are five established adopter categories:

- 1. Innovators** – This category consist of people are eager to try the innovation. They are not afraid to take a risk and are always interested in new ideas. Very little persuasion is required to appeal to this category of people.
- 2. Early Adopters** – This category include people who enjoy leadership roles, and embrace change opportunities. They are already aware of the need to change and so are very comfortable adopting new ideas. Manuals and information sheets on implementation are some of the strategies to appeal to this population.
- 3. Early Majority** – This adopter category consists of people who adopt innovation, but they are rarely leaders. They typically need to see success stories and evidence of the innovation's effectiveness before they are willing to adopt.
- 4. Late Majority** – This category of adopters is sceptical of change. They only adopt an innovation after the majority have tried and adopted successfully.
- 5. Laggards** – This set of people are very conservative. They are very sceptical of change and are the hardest group to convince to adopt an innovation.

### **2.3.3 Implication of the Theories to the Study**

The adoption of the model of skill acquisition became a basis for situating this study in a context that made it possible for the researcher to assess the ICT competencies of lecturers. The model bared the fact, that competence is not a terminal point in the spectrum of skills development; rather, it is a middle stage that must be experienced before proficiency and expertise can be achieved. This discovery set course for this study by ensuring that the levels of ICT competencies of lecturers was not measured as the endpoints of what they could actually produce, but as the reflection of their current competency levels, which were subject to change as they progress to higher stages. Therefore, the understanding provided context for the recommendation made in relation to progression in the training of lecturers in ICT use.

The Diffusion of Innovation theory was adopted in this study with a conviction, that lecturers are a part of the social system and were represented by different adopter categories as long as the use of EIRs is a concern. While electronic information resources are a technological innovation in a social system. Therefore, the theory provided a framework for assessing how lecturers adopt the use of electronic information resources to enhance teaching and research in the universities in Benue State. This became a meeting joint for the two theories, because the higher the lecturers' progress in different stages of ICT skills development, the higher their use of EIRs become.

### **2.4 Types of Electronic Information Resources**

Electronic information resources are diversely available. In order to appreciate their position in the intellectual system of universities, there is a dire need to closely and enthusiastically study them in-depth. Below are the most pronounced EIRs available to lecturers for use.

### **Online Databases**

It is a web-based filing system designed to store information (Omoosekejimi *et al* 2015). They are accessible from a local network or the Internet, as opposed to one that is stored locally on an individual computer or its attached storage. Most academic libraries now subscribe to online databases of books and journals that are relevant to the University curriculum which will help to facilitate teaching and research in the University environment (Omoosekejimi *et al.*,2015).

Online databases are either bibliographical in nature or full text. Bibliographic databases only provide bibliographic information of an article while the latter supply the full text of a document. Examples of full-text databases include Health InterNetwork Access to Research Initiative (HINARI) which consists of health disciplines; Access to Global Online Resources in Agriculture (AGORA) database which provides environmental and agricultural disciplines; Emerald Insight which provides a wide range of management, Library and Information Management Journal; ScienceDirect; Ebscohost, a multidisciplinary database which provides access to many databases including communication, mass media business, religion and philosophy and other disciplines (Sejane, 2017). While bibliographic databases include AGRICOLA (<http://www.nal.usda.gov/ag98/>); ERIC Databases (<http://ericir.syr.edu/Eric/>), PubMed Medline (<http://www.ncbi.nlm.nih.gov/PubMed/>) etc.

### **Electronic Journals (e-journals)**

E-journals are journals provided in a digital format for access via an Internet browser, a computer or other electronic device (Johnson *et al.*, 2012). E-journals may be defined very

broadly as any journal, magazine, e-zine, webzine, newsletter or any type of electronic serial publication, which is available over the Internet (Pawar & Moghe, 2014). They added that e-journals provide research papers review articles, scholarly communication, issued periodically in electronic form by use of automation. They are very useful tools for lecturers because the information from journals can easily, quickly, pin-pointedly and remotely be retrieved, provided the journals are available in electronic format. E.g. African Journals Online (AJO). Open Access full-text e-journals are also available for free access (Pawar & Moghe, 2014). According to Omojokun *et al.*, (2015) most academic libraries now have offline E-Journal Databases to help users find journal materials that are useful to them.

### **Electronic Books (e-books)**

E-books are books that are provided in a digital format for checkout or use via an Internet browser, a computer, or another electronic device like an e-book Reader or e-book devices (Johnson *et al.*, 2012). Digitized books are scanned and saved as a sort of photographic image of the book while the electronic book is generally fully searchable text in a feature-rich environment. Libraries now provide access to a variety of electronic books, as well as the other printed works (such as essays, poems, or historical documents) (Ferdinand *et al.*, 2015). Features like changeable font size, making a citation, links to other relevant sites, searching, sending to other users and so on, wear the interest of users (Pawar & Moghe, 2014). One area that is well recognized as benefiting from e-books is distance learning (Sejane, 2017). However, according to Minčić-Obradović (2011), difficulty with reading on the screen, technical requirement and compatibility with citation software are some of the challenges of e-books. Apart from the technical challenge, the cost is also a major constraint. Questia Online Library (<http://www.questia.com>) is the world 's largest online library of e-books.

## **Electronic Reference Sources**

E-reference resources are resources that are meant to be consulted instead of the page to page reading. Various vendors and publishers are providing various reference sources in electronic form through their databases and web sites (Pawar & Moghe, 2014). Some of them are dictionaries online ([www.dictionaries.com](http://www.dictionaries.com), [www.dic.leo.org](http://www.dic.leo.org)); Yearbooks online ([www.uja.org](http://www.uja.org)); directories online ([www.people.yahoo.com](http://www.people.yahoo.com)) and so on. Wikipedia is a new form of reference source which does not have its printed counterparts. It is a free-content encyclopedia project based on an openly editable model (Ashaver, 2012). Heaps of information are available in Wikipedia and new information can be added by the user and the information available can also be altered (Pawar & Moghe, 2014). It is a veritable tool for research since background information is provided as free content on different subjects across different disciplines.

## **CD-ROM Databases**

It is a pre-pressed optical compact disc that contains data. The name is an acronym which stands for "Compact Disc Read-Only Memory". Omoisejimi *et al.*, (2015) related that computers can read CD-ROMs, but cannot write on the CD-ROM's which are not writable or erasable. It has large storage capacity CD-ROM databases allow users access to relevant databases without robust Internet connectivity in libraries and are more cost-effective than online databases as information can be accessed off-line without telecommunication fees (Afolabi, 2007; Sejane, 2017). If CD ROM databases are networked, clients could access them at various terminals without physically stepping into the library (Sejane, 2017). He added that they have the potentials of identifying bibliographic details of pieces of literature and facilitating access to a

large volume of information for research. From personal observation, these databases are becoming less common in university libraries.

### **Online Public Access Catalogue (OPAC)**

Online public access catalogue includes an electronic bibliographic database that describes books, videotapes, periodicals and so on, in a particular library (Sejane, 2017). It is an electronic version of the library card catalogue. Information about each item in a database is called a record. Elements of an individual record are called fields. Fields can be used as points of access when searching for a database. A record in a periodical database would include information about a periodical article (author, source, date, title, and so on) (ICOLC, 2014). Web-based OPACs also make it easier for users to access e-resources from anywhere without going to the physical library. E.g. World cat, *Modupe* (Botswana Library) and so on. OPAC saves lecturers the stress and time of going through volumes of research materials before finding the relevant ones.

### **Electronic Thesis and Dissertation**

E-thesis and dissertation are now very useful tools to collect large data for specific subjects. This is a very useful service for users, mostly researchers like lecturers. It reduces the duplication of research works and gives assistance for the selection of the research area to the users of the libraries. As these can be searched subject wise, it reduces the labour of the reference staff a lot (Pawar & Moghe, 2014). E-thesis and dissertation are the most authoritative sources of information for research because they contain well-researched works.

### **Open Educational Resources (OER)**

Open educational resources are teaching and research materials that are in the public domain or that can be used under an intellectual property license that allows re-use or adaptation (e.g.

Creative Commons) (UNESCO, 2015). This development helps lecturers in learning from diverse course contents of institutions of learning. OER allows learners, teachers, administrators, and governments to freely access, create and share open document-format educational resources (UNESCO, 2015). For example, the National Open University of Nigeria (NOUN) now makes its educational materials available for others to use freely. These resources enhance the teaching experience of lecturers.

### **Digital Institutional Repository (DIR)**

It is a digital collection of all the intellectual output of a university community or university communities. Joseph (2010) added that this is an online, searchable, web-accessible database containing intellectual works by scholars and researchers organized to increase access to scholarship and ensure their long-term preservation. Gbaje and Mohammed (2017) disclosed that in order to ensure wider dissemination and digital preservation of these scholarly outputs many Universities in Nigeria have deployed Institutional repositories. Ahmadu Bello University's institutional repository is a good example of a digital institutional repository.

### **Internet**

The Internet is both a resource and a source of information. According to Bankole (2013), it is a global system of interconnected computer networks. In a quick response, Egbri (2015) narrated that advances in ICT have produced the Internet which is considered as a sustainable alternative for accessing electronic information resources globally. It has reduced the world to a global village. It is a universal library that contained teaching and research materials for different purposes, which can be sourced anywhere by lecturers provided there are Internet services. The Internet has truly revolutionized how knowledge is communicated and ensure timely access to information (Oladipo & Akinwunmi, 2015; Acanit, 2016). Delivery of electronic information

resources appear in formats such as Hyper-Text Mark-up Language (HTML), Portable Display Format (PDF) documents, as well as through various download or Inter-Library Loan (ILL) means (Sejane, 2017). This offers options to users to decide which one suits their situation and technology.

#### **2.4.1 The State of Electronic Information Resources in Nigerian Universities**

There has been an exponential growth in electronic resources, and academic libraries have been spending a substantial amount of their annual budgets on subscriptions to online databases (Okite-Amughoro, Makgahlela & Bopape, 2014). In a study, Bamigboye, Okonedo, Bakare, Nduka, and Ajegbomogun (2015) reported that TETFund intervention grant has enabled university libraries to subscribe to EIRs. To validate the foregoing, Bogoro (2019) reported that in 2019, TETFund disbursed over 16 billion naira was to public university libraries for library development with the emphasis being placed on e-resources in line with global trends. In another separate research, Ugwu and Orsu (2017) noted that initiatives like MacArthur Foundation, Electronic Information for Libraries' Network (eiFL.Net) and the Universities' Connect MTN Foundation have tremendously facilitated availability of online databases in Nigerian universities. Underscoring the importance of such resources, Tiemo (2016) stressed that EIRs are among the resources inspected by the National Universities Commission in libraries before accrediting programs of universities. This suggests the need for universities to sustain the inspection efforts of NUC by working out modalities to ensure the fullest exploitation of these resources by university lecturers, to smoothen their teaching and research experiences.

However, Okite-Amughoro *et al*, (2014) pointed out that the adoption and diffusion of EIRs in Nigeria is not as rapid and smooth as in advanced information societies, where EIRs are seen as

key to information access and use. In a similar investigation, Tiemo (2016) observed a high level of availability of EIRs in foreign university libraries such as Queen's University (1,750 e-databases); whereas, in Nigeria, a premier institution like Ahmadu Bello University could only boast of 44 subscribed and open-access databases (Kashim Ibrahim Library, 2020). It could be seen that the gap is wide. In their distinct studies, Alison, Kiyangi, and Bazirake (2012), and Fagbami (2014) exposed the fact that EIRs that dominate African universities like Nigeria are open access resources which are free to libraries that have Internet connectivity. Tiemo (2016) added that only a few universities in developing nations like Nigeria subscribe to fee databases. The above assertions do not discredit the fact that the substantial efforts by government and agencies have been directed towards ensuring the availability of EIRs in Nigeria universities.

In the study of the duo, Tiemo and Ateboh (2015) showed that lack of funds has limited university libraries in Nigeria in providing EIRs and other facilities to users. At odds, Bamigboye *et al.*, (2015) argued that the TETFund intervention grant has empowered universities to provide up to date infrastructures, resources, and equipment for users. To corroborate this, Bogoro (2019) disclosed that in the year 2019 only over 16 billion was disbursed to university libraries for providing access to EIRs. This indicates that funding, to some extent, is receiving appreciable attention from government, though it might be inadequate to completely meet the monetary needs of universities.

#### **2.4.2 Use of Electronic Information Resources by lecturers**

Utilization of electronic information is a way of using the information on the varied field which has been accessed for meeting the desired need of lecturers beneficially (relevant to the user) (Iroaganachi and Izuagbe, 2018). Several studies discovered online databases that are commonly used by lecturers in Nigerian universities for their research are: EBSCO HOST, AGORA,

HINARI, MEDLINE, JSTOR, Science Direct, ECONLIT, ERIC, LANTEEL, LEXIS NEXIS, MEDLINE. and OARE (Uzuegbu, Chukwu, &Ibegwam 2012; Ezema, 2015). Akin to this, Ani *et al.*,(2015) added that institutional repositories have been developed in universities for sustainable access to relevant EIRs in research. A number of these e-resources (online databases / digitized local journals) are accessible via the National Virtual Library which is run by the National Universities Commission.

In their comparative study, Iroaganachi and Izuagbe (2018) found that academic staff of private universities are more proactive in the use of EIRs for research more than their counterparts in federal and state universities. The mean rating placed private university first, federal university second, and State third. This revelation comes to terms with the submission of Izuagbe, Hamzat and Joseph (2016) who observed that high technology acceptance and deployment in private universities would possibly make them dominate Nigerian higher education, including the aspect of using EIRs. Evenly acquisition of ICT competencies by lecturers from Federal, State and Private Universities in Nigeria would better improve the quality of Nigerian educational system than the current lopsidedness experienced in the system.

Effective use of EIRs depends absolutely on the availability of computers and Internet access, network connectivity, highly skilled personnel and steady power supply (Simon &Ogom, 2015). Iroaganachi and Izuagbe (2018) broke the silence by opining that when these variables are harnessed, the use of EIRs by lecturers results in improved quality of discussions at conferences, workshops, and symposia; enhanced community service participation; increased research publications; amplified leadership and other relevant skills among others. This shows that ineffective use of EIRs by lecturers instigate severe harm to the intellectual system of every university. The intellectual output of lecturers is grossly affected and their image becomes

tainted on account of lack of proper harmonization of variables that result in effective utilization of EIRs.

However, inadequate computer systems, slow Internet speed, high cost of Internet connectivity, lack of awareness and insufficient bandwidth were highlighted as impediments to the effective utilization of EIRs (Ajibili &Gana, 2013; Igbo and Imo, 2014; Otuza&Omeluzor, 2015). Equally, frequent power outage, improper orientation on use of EIRs, irregular or non-payment of subscriptions, lack of search skills, high cost of access, unreachability of some EIRs and complications in navigating through them, poor ICT skills of lecturers, leisurely downloading and blockage of some websites are also challenges to usingEIRs (Omeluzor, Bamidele &Ogbuiyi, 2012; Adeniran, 2013; Ogbuiyi, Oriogu, Momoh &Ogbuiyi, 2014; Omorekejimi, Eghworo &Ogo, 2015; Amusa &Atinmo; 2016; Sohail &Ahmad, 2017). Despite the challenges of EIRs utilization, university librariesin Nigeria strive to meet up with the demand for Electronic Information Resources to their users (Tiemo, 2016). Merely meeting upwith lecturers' demand in terms of EIRs provision is not enough to judge as a success, but ensuring their utilization and satisfaction from these EIRs.

#### **2.4.3 Benefits of Electronic Information Resources to Lecturers**

Electronic Information Resources is a gift of technology to universities in Nigeria. Egberongbe (2011) insisted that global access to varied information resources is the major benefit of EIRs. It is indeed major because previously there was also access to information but to a limited extent. The only noticeable difference instigated by EIRs is access to information across all geographical boundaries, thereby expunging geographical obstructions. In the same vein, Sejane (2017) tagged them as being up-to-date, multi-dimensional and directional. They cover different issues and directusers to several others. These resources enhance research and are important tools for

study and teaching in any academic institution as they provide improved access to information (Okorie & Agboola, 2012; Ani *et al.* 2015; Isibika & Kavishe, 2018). In the same line of thought, Lwoga and Sukums (2018) concurred that EIRs have a positive effect on research productivity if effectively used. These benefits come alongside use and ICT skills are a precondition for use. This further highlighted the importance of ICT competence.

Significantly also, EIRs broaden the academic experience of lecturers by keeping them abreast of new discoveries and developments through the timely report of research findings that are accessed remotely (Otu, Asante & Martin, 2015; Amusa & Atinmo, 2016; Iroaganachi & Izuagbe, 2018). Lecturers become highly informed on trendy issues through EIRs and prove their versatility in every given task. Also, scholarly communication is enhanced, advanced search capabilities are offered and flexibility in the storage of search results and increase access to a wide range of accurate and timely information on various subjects is experienced (Okite-Amugboro, Makgahlela & Bopape, 2014; Iroaganachi & Izuagbe, 2018). The benefits supplied by EIRs should always be the motivating force for investing in EIRs and empowering lecturers with skills to exploit them maximally.

The views above are however contended by Okezie (2016) who opines that the utilization of electronic information resources does not substitute printed resources but facilitates it through access to a large stock of library materials. Thus, in a situation where print resources are completely pushed aside, such university libraries may not meet up with all demands of information resources from clientele. In consonance, Isaac (2016) maintained that EIRs have a high tendency of enticing new users to libraries and satisfying their specific needs. The enticing feature of EIRs enables university libraries to fulfil their mission of supporting teaching and

research. Print resources are therefore valuable but EIRs receive overwhelming patronage because of its incomparable potentials.

## **2.5 Means of Acquiring ICT Competencies by Lecturers**

ICT competencies acquisition programs are very necessary if the use of EIRs would not remain mere mental stimulation among lecturers. Technology is constantly growing rapidly and updates come up every now and then. Lecturers need to move along with the growing trend by constantly updating their competencies in the use of these technologies so as to utilize EIRs as a competitive advantage for their teaching and research processes (Ojiegbe, 2010; Omotunde, 2017). Omotunde (2017) fell in line by asserting that training of academic staff on the use of ICT devices can't be underestimated in this global age because it can result in the most effective and productive use of electronic information resources and services.

ICT skills are acquired through different sources. Shidi (2011) stated that ICT skills are mostly acquired through training, retraining, and experience. Any learning activity which is directed towards the acquisition of specific knowledge and skills for the purpose of an occupation or task is referred to as training (Cole, 2002; Ojiegbe, 2010). Through training, skills are taught and learned by lecturers. Suleiman (2015) noted that organizations like Nigerian Communications Commission (NCC) and the Tertiary Education Trust Fund (TETFund) have contributed immensely to the development of ICT competencies of lecturers in universities. This is achieved through grants for sponsorship and training. Additionally, study leave, sabbatical leave, academic conferences, panel discussions, interactive experiences, friends/ associates, computer-assisted instructions, classroom instruction, and one to one instruction are some of the training that have greatly improved the ICT competencies of lecturers (Suleiman, 2015; Omotunde, 2017). Worthy of note is that each of the sources of acquiring ICT competencies has its pros and cons.

Training in ICT is very helpful. Ojiegbe (2010) pointed that training in ICT builds confidence in staff; brings an understanding of ICT; and comprehending the capabilities and implications of new technologies. However, Quinn (2003) cited in Omotunde (2017) argued that university lecturers in Africa have undergone little or no training for their role as lecturers, let alone training for ICT usage. He settled that it is as if higher education institutions in Africa are using imported ICT staff development approaches in the training of its employees. In another way, Africa is not only importing ICT facilities but also ways of training their own people. This is a general assertion that may not be necessarily true in individual countries and universities in Africa.

Retraining is another source of ICT competencies acquisition. It involves learning new skills or updating existing skills. In a study conducted by Duhu and Ezugu (2017), they discovered that retraining of lecturers particularly in ICT enables online learning (e-learning). This implies that for lecturers to effectively learn in a virtual environment, retraining is very essential. Ojeniyi and Adetimirin (2016) stressed this by echoing that retraining of academic staff on various ICT skills provides them with the needed ability to meet the challenges of academic activities. Similarly, Olafare, Adeyanju, and Fakorede (2017) recommended retraining of lecturers in ICT. This is because development in technology is dynamic and lecturers need to keep abreast of current trends through the use of electronic information resources.

Formal training is also discovered as a source through which lecturers acquire ICT competencies. According to Olaniyan and Ojo (2008), a practical and theoretical teaching process which could be done within or outside the university is known as formal training. Formal continuing education such as Masters program, informal education (distance learning), self-study (learning by doing), training by suppliers, attending IT programs and participation courses are platforms

that improve lecturers' ICT competency (Ojiegbe, 2010). This explains the increasing interest among lecturers in obtaining certificate or Diploma in computer appreciations. Formal education can be internally, that is organized within the workplace, or externally, outside the workplace.

Coaching and Mentoring have been proposed as some of the ideal sources of acquiring ICT competencies (Ojiegbe, 2010). Coaching according to Gani (2013) is the traditional practice of assigning a less experienced lecturer to work under the watchful eye of a superior and more experienced colleague. Similarly, mentoring is a process of using a lecturer with a lot of knowledge and experience in the area of ICT, to advise and guide the newly-employed hands on the use of ICT tools (Gani, 2013). These sources help in the cumulative development of the student lecturer's skills in exploiting it. However, this can only be achieved when the trainees have confidence in the trainer.

ICT has enabled Internet and intranet-based trainings. This enables lecturers to acquire more ICT skills through electronic learning. W3 schools ([www.w3schools.com](http://www.w3schools.com)) is an example of such e-learning. Learners communicate with their trainers irrespective of distance and share course materials through e-learning (Gani, 2013). Similarly, Computer-Aided Instruction (CAI) is gaining acceptance as a source of acquiring skills. CAI involves interaction (either online or offline) between a learner and programmed instructional materials. For example, lecturers could develop typing skills through the Mavis Beacon typing software package. This training method is cost-effective.

## **2.6 Level of ICT Competencies Possessed by Lecturers**

The pervasive influence of ICT is no longer in doubt. As a result, Asogwa (2014) opened up that modern tools used for teaching, recreation and research have placed added pressure on the existing skills, tools, and competencies of institutions and the workforce. In response to this,

Kpolovie and Awusaku (2016) argued that “everyone and indeed every organization necessarily needs to be effective and efficient in the use of ICT as a real success in today's changed, rapidly changing and the highly competitive world depends on such knowledge and skills”. In the face of this present technologically-driven educational system, lecturers can only measure up to standard if they possess ICT competencies with which their academic responsibilities will be enhanced.

ICT competencies may be summed up as the ability of university lecturers to use ICT tools to utilize electronic information resources for teaching and research or the ability of individual lecturers to manipulate technological devices for effective information gathering, organization, processing, and retrieval. In a similar view, Kpolovie and Awusaku (2016) posited that the ability of university lecturers to make use of the various ICT tools such as e-mail, the Internet, the World Wide Web, intranets, extranets, online database and other networking technologies in teaching and research in ICT competencies. These ICT competencies are possessed in levels.

In strengthening the above point, Akoojee, Arends, and Roodt (2008) proposed levels of ICT competencies for developing countries as follows:

- 1. Lower or basic ICT skills:** ICT know-how required to process and analyze data. At this stage, competence is assessed in word processing, spreadsheet, and PowerPoint presentation as adopted from Oyedokun *et al* (2018). This skill category constitutes of basic ICT users.
- 2. Intermediate ICT skills:** This involves applying ICT extensively to accomplish core tasks and functions. As adopted from Oyedokun *et al* (2018), competence at this level is assessed in Internet browsing, Database searching and web content creation. This skills category comprises of middle ICT users.
- 3. Higher or Advanced ICT skills:** This has to do with the development of software and hardware as well as its maintenance. Programming, networking, and technical skills are

assessed under this level as adopted from Oyedokun et al (2018). This skill category encompasses ICT specialists.

Studies have bared some of the ICT competencies possessed by lecturers. Nwachukwu and Asom (2015) mentioned that booting computers, surfing the Internet, sending e-mails, keyboarding, creating and deleting files, printing out documents, word processing, data copying and starting a program are the most obvious skills possessed by lecturers. Similarly, Ojeniyi and Adetimirin (2016) added in their study that Internet browsing, Internet navigation, Internet searching, and desktop publishing skills scored high among Nigerian lecturers. These skills are necessary for exploring the inherent benefits of EIRs. On this note, Ojeniyi and Adetimirin (2016) opine that since EIRs will always be consulted for information, communication, academics, and research needs, every academic staff should be adequately equipped with necessary ICT skills to facilitate easy access and retrieval of relevant information. Collective responsibility of all authorities is demanded in equipping lecturers with ICT skills.

In another study, Batool and Ameen (2010) cited in Farooq *et al* (2018) categorized ICT skills into four: computer hardware, word processing, Internet and troubleshooting. Computer hardware involves lecturers' ability in installing, troubleshooting and replacing computer parts. Word processing has to do with lecturers' proficiency in formatting documents. Internet is related to lecturers' capacity in entering web addresses, using different search engines and performing emailing functions. Troubleshooting is linked to lecturers' ability to identify system malfunctions. Additionally, Ayoku and Victoria (2015) highlighted database management, Internet and database searching, and web design as some of the ICT competencies. These ICT competencies equip lecturers to exploit the wealth of information available to them electronically. To assent this, Ojeniyi and Adetimirin (2016) documented that lecturers must

possess the technical know-how and other skills required for the effective utilization of electronic information resources. ICT competencies become a dire necessity that cannot be overlooked by lecturers who aspire to register their names in the flow of academic history and attain a height that will attract applause for them from posterity.

Lecturers' ICT competencies are greatly influenced by their knowledge of ICT. It can, therefore, be noted that developing competence in ICT use, requires a deep foundation of the knowledge of ICT itself and coordination of such knowledge in manners that enable the application. Knowledge of ICT can be explained as a fundamental understanding of computer-oriented technologies, as well as their use. This infers that lecturers are acknowledged competent when their knowledge of ICT is applied in manipulating it. Hennessy et al., (2010) witnessed that the lecturers' knowledge of ICT operations is an important step towards integrating ICT into teaching and other academic involvements.

ICT competencies are very central to the quality of the work of lecturers. These competencies enhance their working methods (Diri, 2013; Ololube, Kpolovie & Makewa, 2015). Quadri (2012) explicitly stated that ICT skills promote the use of electronic information resources, e-learning, and resource sharing. This suggests that ICT competencies of lecturers are a topmost prerequisite for the effective use of electronic information resources. In confirming this, Akpan, Essien, Ekpenyong, and Obot (2011) found out that lecturers with high ICT competence were found to be more efficacious in classroom instruction, research/publication, communication and recordkeeping than those with moderate and low ICT competence. With these competencies, lecturers would save themselves from untimely disappearing from the stage of relevance in the academic world. According to Ada (2014), ICT competencies play three major roles, which are as follows:

- I. ICT as an enabler
- II. ICT as a support infrastructure
- III. ICT as a utility for innovation

*ICT as an enabler.* Most information resources in Nigerian universities are presented electronically and as such, acquiring ICT skills enables the efficient use of those resources. ICT competency enables the use of EIRs. Similarly, *ICT as a support infrastructure* makes it possible for lecturers to deploy ICTs in searching, retrieving, formatting and using of EIRs. Furthermore, *ICT as a utility for innovation* optimizes processes involve in accessing EIRs by lecturers. This summarized the workings of ICT competencies by the possessor.

Sadly, however, researches have shown that many Nigerian university lecturers lack relevant ICT skills, thus most of them cannot locate and retrieve EIRs through the use of ICT because they are not adequately equipped in ICT skills (Ngare, 2007, Ojeniyi & Adetimirin, 2016). By implication, most of them cannot effectively utilize EIRs available in universities. This deformity will definitely hinder them from competing globally with their contemporaries except drastic measures are employed by concerned authorities to ameliorate this gloomy situation.

## **2.7 The Extent of Applying ICT Competencies by Lecturers**

The extent to which lecturers integrate ICTs in teaching and research is greatly reliant on their ICT skills. Archibong, Anijaobi-Idem and Ogbiji (2010) studied the ICT Competence among Academic Staff in universities in Cross River State, Nigeria. They found out that the competency level of academic staff in utilizing ICT is very low since the combination of staff that indicated that they were either competent or very competent in the utilization of ICT in all the indices measured was below fifty percent (50%). Academic staff is still not skilful in utilizing ICT for

common purposes such as teaching, data analysis, e-learning, and others. Given this result, the outcome of teaching and research will be very pathetic.

In another study, Ojeniyi and Adetimirin (2016) discovered that lecturers in selected private universities studied principally apply their ICT skills to general computer operations, Internet browsing and Internet searching, which guarantee the use of the plethora electronic information resources available on the Internet for teaching and research. Emeasoba and Ezenwafor (2014) assessed the extent of computer operation and networking competencies possessed by office technology and management lecturers in tertiary institutions in Anambra and Enugu States. They found that their computer operation and networking skills were low. Among the 10 items rated by the respondents, only two items were possessed at a high level. All these studies repeatedly attested that the extent of ICT skills of lecturers in Nigerian universities is low. This implies a low application of ICTs in teaching and research.

In Ghana, Amua-Sekyi and Asare (2016) discovered that ICT skills of lecturers are good and are specifically applied to sending e-mails, accessing the Internet, preparing PowerPoint presentations, downloading documents and searching databases. This is still basic since skills like programming, networking and others were invisible in their discoveries.

Nonetheless, Ojeniyi & Adetimirin (2016) observed that the use of ICT by most Nigerian university lecturers is far below expectation as a result of the inadequacy of relevant ICT literacy skills. To corroborate the foregoing, Ngare (2007) observed that some do not know the sources of electronic resources and cannot locate and retrieve them through the use of ICT because they are not ICT literate and lack the technical knowhow of ICTs. Consequently, such lecturers cannot appreciate the versatility of ICTs in handling teaching and research functions. Ojeniyi and Adetimirin (2016) advocated for adequate equipping of lecturers with necessary ICT skills

because there will always be the need for ICTs to meet their personal and professional demands. Instead of heavily demanding employers to become technologically relevant, lecturers can consider the demands placed upon them by the current age and be ready to live up to it without much external support.

## **2.8 Challenges in Applying ICT Competencies by Lecturers**

Researches have shown that the level of ICT competencies of lecturers is not yet a story to pride in. The major problem, however, lies in inadequate ICT technical personnel (Kpolovie and Awusaku, 2016), which limits the extent of ICT training of lecturers and by extension, affects its application. This has made universities to depend largely on private commercial vendors to provide ICT services such as procurement, installation, use and training. These services are mostly commercial and lack academic content and result (Kpolovie and Awusaku, 2016). Fagbe *et al.*, (2015) reported a poor attitude toward change in technology as a challenge. This poor attitude can actually slow down every quest for acquiring new skills and applying it in exploiting EIRs by lecturers. Explicitly, Kpolovie and Awusaku (2016) submitted that faculty members are not willing to take the modern approach to teach and learning rather; they stick to the old-fashioned hard approach. The reluctance of some lecturers to switch over to modern technologies by acquiring ICT skills has denied them access to the wealth of EIRs that can improve their intellectual output.

Poor maintenance culture or poor ICT management has also constituted a great challenge in applying ICT skills by lecturers in universities (Fagbe *et al.*, 2015; Ezeugwu *et al.*, 2016). Improper maintenance of ICT facilities hinders their durability and result in ineffective or non-functionality of facilities that would have been used to access EIRs. Apart from this, the absence of enabling environment, including highly regulated telecommunication industry, unsatisfactory

performance of Internet service providers and absence of incentives to promote innovation and risk-taking, keep lecturers from applying skills to perform academic tasks (Drummond, Sheperis & Jones, 2016). This is true but lecturers must be more determined to confront these inevitable challenges and climb to the peak in their profession by developing themselves technologically and applying their skills to tap from the wealth of treasures provided by ICT.

Individual universities also constrain the application of ICT competencies. Degraft-Otoo (2012) enumerated a lack of top management support for training, failure to provide adequate resources (finance, people and time) required to implement the training and failure to understand the training needs as some of institutional challenges to ICT competence application. The author only addressed these challenges from the institutional point of view without incorporating the unwillingness of those to be trained, thereby making his report imbalance. In addition, Muzaffar and Malik (2013) identified extra workload, insufficient time, absence of incentives in professional development trainings, much emphasis on theoretical aspects than practice, family responsibilities, conservativeness, lack of awareness regarding fulness of training and conflict with teachers working schedule as an impediment to general training. The end result of these challenges is non-application of ICT skills because of lack of adequate ICT training that capacitates lecturers to exploit EIRs. Mandina (2015) added a lack of confidence as a barrier to lecturers' use of technology. If ICT competencies are not counted optional for lecturers but are really seen as a need that must be met for better productivity, some of these challenges would become less pronounced.

Summarily, Anunobi (2004), Archibong *et al.*, (2010) have abridged ICT competencies development challenges into four categories:

*Funding-related challenge:* Many lecturers are reluctant to use their salaries for the purpose of acquiring training in ICT, thus becoming skill-less. Also, there is little or no sponsorship from the university for ICT training. In agreement, policymakers operating within budget constraints tend to give slight priority to hardware and software acquisition (Archibong *et al.*, 2010). Thus, a lack of adequate funding has a ripple effect on the procurement and use of ICT in Nigerian university education and the acquisition of ICT skills among lecturers (Archibong *et al.*, 2010).

*Facility-related challenge:* Access and proximity to ICT facilities pose a great problem to lecturers. Even those that are competent lack the necessary ICT facilities at their workplaces. Bandwidths that ensure speed in accessing Internet are insufficient in most Nigerian universities. The basic software needed for practical works is not obtainable, and where they are available, they are not accessible because of the low ration. Power supply among universities is still beggarly. In the absence or diminutive availability of these facilities, the training and experience that lecturers require to be competent in ICT application for use of EIRs would not be possible.

*Personal-Related Challenge:* Excess academic workload does not permit most lecturers to train or even improve upon their ICT skills. Fear of success or failure in the training exercise. This does not conceal the fact that some lecturers lack interest in ICT while some are unwilling to exercise patience to learn. Archibong *et al.*, (2010) gestured that academic staff should have a rethink towards ICT training and make time to improve their competences irrespective of their workload.

*Institutional-Related Challenge:* Lack of motivation and encouragement from the institution; absence of sponsorship to attend workshops and seminars and also lack of ICT facilities in their institutions.

By implication, the use of EIRs would drastically reduce in universities where these challenges are dominant, which will definitely translate to low quality of academic output.

## **2.9 Review of Empirical Studies**

To further illustrate the application of ICT competencies in the use of Electronic Information Resources, below are relevant empirical studies.

In India, Ahmad and Panda (2013) conducted a survey on awareness and use of electronic information resources by the faculty members of Indian institutes in Dubai International Academic City (DIAC). The purpose of the study was to find out whether the faculty members of Institutes/Universities are aware of and fully utilize the databases and other electronic information resources within and outside the libraries. The survey research design was employed for this study. The structured questionnaire method was used to elicit data from the 30 faculty members of the three institutes, representing ten from each. The results revealed that the majority of the faculty members are aware and use electronic information resources. The study confirmed to some extent the lack of knowledge and use of libraries' specific resources such as e-theses, patents, and CD-ROM database. It was also found that 100% of faculty members agreed that e-resources were very useful and important to their work.

In Kenya, Ochogo, Rambo and Mbweza (2016) studied the influence of computing competence on Lecturers' preparedness for e-learning at the University of Nairobi, Kenya. The focus of the study was to determine the influence of lecturers' computing competence and preparedness for electronic learning (eLearning), focusing on word processing, spreadsheets, presentation, statistical analysis, Internet browsing, and e-mailing software packages. The cross-sectional survey design was employed with both quantitative and qualitative approaches to source data from 212 lecturers and 108 administrative staff in May 2011. Out of 212 participants, 103

(48.6%) had a mean score of 50% or higher; while 109 (51.4%) scored less than 50%; suggesting that slightly more than one-half of the lecturers were below average in terms of computing competence. Those whose competence in applying word processing, spreadsheets, presentation, statistical analysis, Internet browsing, and e-mailing software packages was above average are prepared for eLearning more than those whose competence was below average. They recommended structuring of training programs to improve lecturers' preparedness to function in an e-learning setting.

Bamigboye, Bankole, and George (2013) conducted a research on teachers' attitude and competence towards the use of ICT resources: A case study of the University of Agriculture Lecturers, Abeokuta, Ogun State, Nigeria. The main objective of this study was to investigate the teachers' attitudes and competence in the use of ICT resources. The research design used for the study is the survey method. The population of the study was lecturers at the Federal University of Agriculture, Abeokuta. Questionnaire and observation instruments were used to gather data from the respondents. The findings revealed that the majority of the lecturers have positive attitude and competency towards the use of ICT resources in their lectures. The study concludes by recommending that the university administration should provide more training in the area of ICT to its staff and improve on regular and uninterrupted power supply to the campus.

Chukwuedo and Igbinedion (2014) conducted research on ICT competencies and capacity building needs of Technical and Vocational Education (TVE) Lecturers in Nigerian Universities. The main purpose of the study was to identify ICT competences that TVE lecturers in Universities in South-south Nigeria need in order to perform their work tasks effectively. The study employed a descriptive survey research design. All the TVE lecturers in the universities in the five states of the south-south geopolitical zone of Nigeria formed the population of the study.

The sample size of the study was 90 TVE lecturers selected from six universities in the five states of the south-southern geopolitical zone of Nigeria. A questionnaire of two-scale components for possessed and needed ICT competencies constructed and validated by experts was used for data collection. The data analyses revealed that TVE lecturers need capacity building in the use of ICT for instructional, research and administrative purposes. It was recommended that state and federal governments should develop and implement a functional provision of packages for the training and retraining of TVE academic staff members in the use of ICT for effective and efficient job performance.

In another study, Ojeniyi and Adetimirin (2016) carried out research on ICT literacy skills and electronic information resources use by lecturers in two private universities in Oyo State, Nigeria. The purpose of the study was to investigate the influence of ICT literacy skills on electronic information resources (EIR) use among lecturers of two private universities in Oyo State, Nigeria. The descriptive survey design was adopted for the study and using the total enumeration sampling technique, the study population and study sample consisted of 234 academic staff from both Ajayi Crowther University (ACU) and Lead City University (LCU). The questionnaire was the data collection instrument used. Data were analyzed using descriptive and inferential statistics.

The findings revealed that E-mail and Websites were the most available resources to lecturers of both universities. Lecturers in ACU had high ICT literacy skills in General Computer Operation while those in LCU had high ICT literacy skills in General Computer Operation, Internet Browsing, Internet Searching, and Computer Appreciation. E-Mail and website were the most often used e-resources among lecturers of both universities, erratic power supply and poor Internet

connection were the major challenges encountered in the use of e-resources. There was a positive significant relationship between ICT literacy skills and e-resources of lecturers.

## **2.10 Summary of the Review**

The review of the literature was based largely on documentary sources, many of which consisted of books, journal articles, conference proceedings, seminar/workshop papers, articles from the Internet and other relevant publications. Literatures brought to bear that EIRs have exploded in popularity in universities in Nigeria recently because of their educational value. Against the popular opinion of many, these resources are not limited to text but include other multimedia tools. Nigerian universities are lagging behind in terms of availability and use of EIRs as compared to foreign universities.

The various means through which lecturers acquire ICT competencies were equally reviewed. Advances in Information and Communication Technology (ICT) have birthed Internet and intranet-based training, whereby some Nigerian university lecturers around the world are now acquiring their ICT competencies through web platforms. But literature has not reported whether this experience is true with university lecturers in Benue State.

The level of ICT competencies of lecturers was also reviewed which lime lighted that lecturers possessed basic ICT skills against advance ICT skills recorded in other developed nations. This study expands its scope to include intermediate and advanced ICT skills of lecturers in order to ascertain if the story is different.

The extent of applying ICT competencies in the use of electronic information resources is quite appreciated against the situation that was obtainable in Nigerian universities a decade ago but no particular literature reported the situation of lecturers in universities in Benue State. This gap

made this study more relevant because it was able to dig out their true extent of applying ICT competencies.

More literature was also reviewed on challenges faced by lecturers in applying ICT competencies. The major challenge was the absence of adequate ICT training. It was not clearly revealed whether this is also true with universities in Benue State.

On a general note, in the course of the literature review, though no research/study was conducted specifically on this topic, there were related studies that were consulted and reviewed. This gap in literature and knowledge conceived this study.

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## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter discusses the research methodology adopted for the study, the population of the study, sample size and sampling techniques, instruments for data collection and procedures for data collection and data analysis.

#### **3.2 Research Method and Design Adopted**

The quantitative research method was adopted for this study. Kothari (2004) described quantitative research as a research method that is centred on the measurement of quantity or amount. Creswell (2014) noted that the quantitative research method provides a numeric description of trends, attitudes, or opinions of a population by studying a sample of that

population. From sample results, the researcher generalizes or draws inferences to the entire population. It was used in this study because it is best applicable to phenomena that can be expressed in terms of quantity.

This study adopted a cross-sectional survey design. The cross-sectional design is the type of design by which data are collected at the same point in time but over differing entities or groups. According to Kothari (2011) cross-sectional survey design involves data collection from a population, or a representative subset, at one specific point in time. It has an advantage over other research designs that only seek individuals with a specific characteristic, with a sample, often a tiny minority, of the rest of the population. The choice of cross-sectional survey design is justified since the study dealt with different entities like age, gender, educational qualification, professional rank and working experiences of lecturers from federal, state and private universities in Benue State.

### **3.3 Population of the Study**

The population of the study is a subject being focused by a researcher often expressed in terms of a number of persons being addressed by the researcher in their entirety and from which a representative is taken as a sample. Yaya (2014) described a population of the study a group of individuals or respondents or elements or observable materials that a researcher has to contact or concerning the specific areas of attention of the researcher. Premised on this, the population of this study constituted all the lecturers in the three full-time universities in Benue State; namely: University of Agriculture, Makurdi; Benue State University, Makurdi and University of Mkar,

Mkar. Table 3.1 below presents the breakdown of the population according to the respective universities:

Table 3.1: Distribution of the Total Population of Lecturers in the full-time Universities in Benue State

<b>Universities in Benue State</b>	<b>Population of Lecturers</b>	<b>Percentage (%)</b>
University of Agriculture, Makurdi	789	51.3
Benue State University, Makurdi	604	39.3
University of Mkar, Mkar	144	9.4
<b>Grand total</b>	<b>1, 537</b>	<b>100</b>

Source: Office of the Registrars of UAM, BSUM and UMM, 2018.

### 3.4 Sample Size and Sampling Techniques

A sample is a subset of a population that is used to represent the entire group as a whole. Yaya (2014) defined sample as a manageable section of a population but elements of which have common characteristics of the elements making up the sample that are actually studied and generalizations or inferences about the population are made. Cost and time of studying the whole population necessitated the use of a sample, which takes the fair portion as representative of the entire population. The sample size is the number of elements that are selected for research. The sample size for a population that falls within the range of 1500-1599 according to Krejcie and Morgan (1970) table of determining sample size is 306 (see appendix IV). Therefore, the sample size for the total population of 1, 537 was 306 lecturers (see Table 3.2 for the breakdown).

Sampling technique is a process by which a number of observations are taken from a larger population or a process of taking a subset of subjects that is representative of the entire population. Cluster and simple random sampling techniques were adopted for this study. Kothari (2004) defined cluster sampling as grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample. The population of this study

was clustered into Federal, State and Private Universities in Benue State. Simple random sampling was employed to select lecturers from each of the clusters. Yaya (2014) defined Simple random sampling as a sampling in which every member of the population has an equal chance of being selected for a study. It was best for this study because the population was homogenous, the sampling frame is available and the population size is determinate. Table 3.2 below presents the breakdown of the sample size of the respective universities.

Table 3.2: Distribution of Sample Size of Lecturers in the full-time Universities in Benue State

<b>Universities in Benue State</b>	<b>Population of Lecturers</b>	<b>Percentage (%)</b>	<b>Sample Size</b>
University of Agriculture, Makurdi	789	51.3	157
Benue State University, Makurdi	604	39.3	120
University of Mkar, Mkar	144	9.4	29
<b>Grand total</b>	<b>1,537</b>	<b>100</b>	<b>306</b>

Source: Office of the Registrars of UAM, BSUM and UMM, 2018.

### 3.5 Instrument for Data Collection

Instruments for data collection are devices through which data is gathered from the subjects of the study in order to maximize response and accuracy. The questionnaire was selected as the instrument for data collection. Ibrahim (2013) defined a questionnaire as an instrument consisting of a set of questions presented to respondents for answers. It is close-ended when questions contain all possible prewritten answers categories while open-ended questionnaire permit short or single-word answers from the respondents. This study employed the two types of questionnaire in amassing data (see appendix VI). The questionnaire was preferred because it helps in eliciting for desired data, make data comparable and minimize bias in formulating and asking questions.

The questionnaire was grouped into sections. Section A (demographic information) of the questionnaire covered the names of the three full-time universities in Benue State while the second part of the questionnaire consisted of the following sections:

**Section B:** Types of Electronic Information Resources (Questions 1). This question had nine (9) prewritten responses and space for lecturers to indicate the uncaptured item(s).

**Section C:** Means of Acquiring ICT Competencies by Lecturers (Questions 2). The question under this section had eight (8) items with space for specification by lecturer any unincluded item (s).

**Section D:** Level of ICT Competencies Possessed by Lecturers (Question 3-4). The two questions were presented on four Likert scales: Very High (VH), High (H), Low (L) and Very Low (VL). The first question contained six (6) items while the second question contained nine (9) items with spaces for the indication of the uncovered item(s) by the lecturers.

**Section E:** The Extent of applying ICT competencies by Lecturers (Question 3). This question was also presented on four Likert scales: Highly Applied (LD), Averagely Applied (AD), Rarely Applied (RD) and Never Applied (ND). It contained nine (9) items.

**Section F:** Challenges in Applying ICT Competencies (Question 5). Nine (7) prewritten responses were presented under this question with one open-ended question.

### **3.6. Validity of the Instrument**

In order to ensure that the instrument supplied the required data for this study, the instrument was exposed to face and content validation. According to Ibrahim (2013), face validity is based on the subjective judgment of the researcher. Each question was scrutinized and modified until the researcher is satisfied that it is an accurate measure of the desired content. Creswell (2014) defined content validity as to how well an instrument covers the content it was intended to

measure. The validity of the instrument was ascertained by the two supervisors of this work and one lecturer from the Department of Computer Science, Ahmadu Bello University, Zaria. These experts scrutinized the instrument with respect to; clarity of terms, simplicity of vocabulary, the relevance of terms to the study and made necessary suggestions for the improvement of the quality of the instrument. Their observations, corrections, and amendments helped to strengthen the instrument.

### **3.7 Reliability of the Instrument**

In order to establish the consistency of the instrument of data collection, a pilot study was conducted in Ahmadu Bello University, Zaria, after experts' validation. Reasons being that Ahmadu Bello University, Zaria is a relevant population (in terms of attributes) and did not form part of the final sample. Hence, the instrument was tried on 10 lecturers from the Departments of Library and Information Science, Vocational and Technical Education, Human Kinetics, CRS Education, Animal Science, Human Physiology, Chemical Engineering, and Biology. The choice of the departments was depended on the lecturer (s) that agreed to tick the questionnaire. Cronbach alpha reliability test was used to test the internal consistency of the instrument. The choice of alpha reliability was because the instrument is polytomous scored; that is, it is good for items that have more than two possible scores like Likert-type items. The Cronbach alpha reliability test was carried out on the instrument using Statistical Package for the Social Sciences (SPSS), and a reliability level of 0.98 was obtained (see appendix VII). This guaranteed the reliability of the instrument.

### **3.8 Procedure for Data Collection**

This means ways in which the researcher wishes to adopt in order to collect data for the study, which will be organized, analyzed and interpreted in any research undertaking. The researcher collected introductory letter from the Department of Library and Information Science, Ahmadu Bello University, Zaria and then proceeded to each of the full-time universities in Benue State to administer the questionnaires with the support of clerical staff in the offices of various Heads of Department (HOD) within a period of one month and a week. The clerical staff was used because of their familiarity with the lecturers in their departments, thereby making filling and collection of the questionnaires from lecturers much easier.

### **3.9 Procedure for Data Analysis**

This involves the process of inspecting, cleaning, transforming and modelling data with the goal of highlighting useful information, suggesting conclusions and supporting decision making. Response rate and questions 1, 2 and 5 were analyzed using descriptive analysis in form of simple percentages, frequencies, and charts while mean and standard deviation were used to analyze questions 3-4 via the Statistical Package for Social Science (SPSS). Meaningful presentation and simpler interpretation of data informed the choice of the above forms of descriptive statistics. The mean value of 2.50 was used as a benchmark for decision in questions 3-4. The benchmark for the responses was obtained by adding the value of the Likert scale ( $4+3+2+1=10$ ) and dividing it by 4 ( $(4+3+2+1)/4$ ) to obtain a mean benchmark of 2.50. Any item ranked from 2.5 and above was regarded as accepted; while anyone from 2.49 and below was regarded as rejected. The benchmark of 50% was used for decisions in questions 1, 2 and 5. Any item ranked from 50% and above was regarded as accepted or available; while anyone from 49% and below was regarded as rejected or not available.

The inferential statistic in the form of One-Way Analysis of Variance (ANOVA) was used to test the hypotheses. The choice of ANOVA was justified by the fact that it is used in determining whether there are any statistically significant differences between the means of two or more independent groups like ICT competencies of lecturers in the federal, state and private universities in Benue State.

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## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND DISCUSSION

#### 4.1 Introduction

This chapter presents, analyzes and discusses the data collected from the research respondents based on the five research questions posed in the study and the null hypotheses. The presentations were done based on the following headings:

4.2 Response Rate,

4.3 Data Analysis and Discussion

4.4 Hypotheses Testing

#### 4.2 Response Rate

A total of three hundred and six (306) copies of questionnaire were distributed to the lecturers in the three universities (UAM, BSUM, AND UMM) studied in Benue State. The distribution was done according to the departments in different faculties/colleges in the universities. Out of the 306 copies of the questionnaire administered, 273 were duly completed, returned and used for this study. The distribution of the response rate is shown below:

Table 4.1. Response Rate

Universities in Benue State	Questionnaires Distributed	Questionnaires Returned	Percentage (%)
University of Agriculture, Makurdi	157	135	44.2

Benue State University, Makurdi	120	110	36.0
University of Mkar, Mkar	29	28	9.2
<b>Total</b>	<b>306</b>	<b>273</b>	<b>89.3</b>

Source: **Field Survey, 2019**

Table 4.1 vividly shows that the cumulative total of returned questionnaires was 273, representing 89.3% while thirty-three (33) copies of questionnaires were not recovered, representing 10.7%. The good response rate could be attributed to the researcher's collaboration with the clerical staff in each Department where data was collected and the time the researcher dedicated to supervising the whole exercise. The copies which were not returned were basically as a result of displacement, absence of the respondents from duty after receipt of the

S/N	Resources	UAM	BSUM	UMM
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questionnaire, and denial of attention by the lecturers in the universities.

### **4.3 Data Analysis and Discussion**

The data amassed from the research respondents was based on the five research questions posed in this study and was analyzed and discussed in this section. The presentation was done according to the four-point Likert Scale as aptly captured in the research instrument. Mean and standard deviation was used for the scaled questions while non-scaled questions were analyzed using simple frequency, percentage and bar chart.

#### **4.3.1 Availability of Electronic Information Resources**

		<b>F</b>	<b>%</b>	<b>D</b>	<b>F</b>	<b>%</b>	<b>D</b>	<b>F</b>	<b>%</b>	<b>D</b>
1	Online Databases	81	60	√	84	76	√	18	64	√
2	Electronic Journals	93	68	√	82	75	√	20	71	√
3	Electronic Books	78	58	√	76	69	√	15	54	√
4	Electronic Reference Sources	39	28	×	60	55	√	11	39	×
5	CD-ROM Databases	24	17	×	48	44	×	10	36	×
6	Online Public Access Catalogues	39	28	×	54	49	×	1	4	×
7	Electronic Thesis and Dissertation	30	22	×	48	44	×	3	11	×
8	Open Educational Resources	60	44	×	48	44	×	7	25	×
9	Digital Institutional Repository	24	17	×	40	36	×	2	7	×

Table 4.2. Availability of Electronic Information Resources N = 135, 110, 28

Source: Field Survey, 2019 D= Decision √ = Available × = Not Available

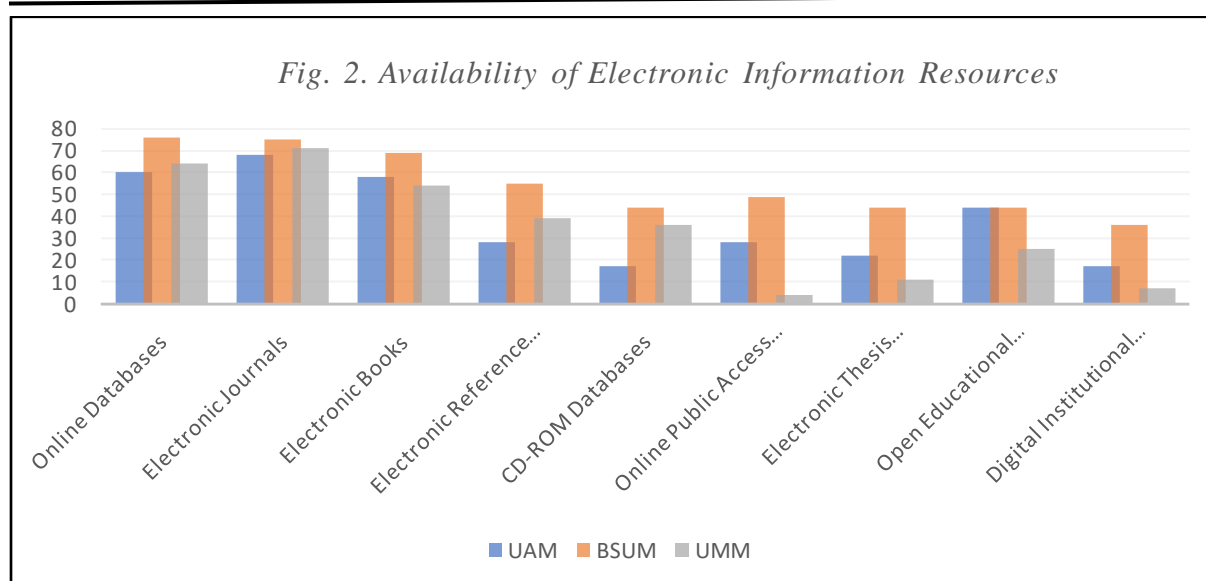


Table 4.2 and Figure 4.1 clearly shows the availability of electronic information resources in the universities in Benue State. Electronic Journals(68%), Online Databases(60%) and Electronic Books(58%) were available to lecturers in UAM with a percentage above the 50% standard. In BSUM, Online Databases (76%),Electronic Journals (75%),Electronic Books (69%), and Electronic Reference Sources (55%) were available with a percentage higher than the 50% benchmark. While Online Databases (64%), Electronic Journals (71%), and Electronic Books (54%) were found in UMM with percentage exceeding the 50% yardstick. On the other hand, Online Public Access Catalogue (OPAC), CD-ROM Databases, electronic thesis, and

dissertation and Digital Institutional Repository were unavailable in the three universities, since their individual percentages fell below 50% point of reference.

It can, therefore, be inferred from the result above that electronic journals, online databases electronic books, and electronic reference sources are the available electronic information resources in the universities in Benue State. This is probably because of the resources inherent capacities in enhancing research and teaching endeavours of the lecturers. The presence of e-reference sources in BSUM only could either be attributed to the fact that the university library place high premium on providing and ensuring access to such resources for consultation purpose than the other two varsities, or the lecturers in the other two universities lack adequate awareness of the existence e-reference sources in their universities.

The finding of the study is in conformity with Agber and Agwu (2013) who found out that electronic journals and electronic books are the most available and used EIRs by lecturers. The finding is further strengthened by the revelation of Omosekejimi *et al* (2015) that most academic libraries now subscribe to online databases of books and journals that are relevant to the university curriculum which helps to facilitate teaching and research. The outcome of this study also upholds the finding made by Tiemo (2016) that there is a high level of availability of EIRs in foreign universities. This study provided evidence that the gap still exists since most of the resources considered in this study received low responses from the respondents on the agreement of their availability.

The implication of this study is that if the available EIRs are effectively utilized, they can broaden the academic experience of lecturers by keeping them abreast with new discoveries and developments through timely reports of research findings. As a result, improved quality of

teaching and increased research publication will become inevitable in the universities. Non-use of these resources could bring about ineffectiveness and inefficiency in teaching and research.

### 4.3.2 Means of Acquiring ICT Competencies

Under this section, the researcher sought to discover the means or methods through which the lecturers in the universities under study develop ICT competencies.

Table 4.2. Means of Acquiring ICT Competencies by Lecturers N =135, 110, 28

S/N	Means	UAM			BSUM			UMM		
		F	%	D	F	%	D	F	%	D
1	Internet/Distance learning	75	56	√	60	55	√	14	50	√
2	Computer Assisted Instructions	78	58	√	66	60	√	12	43	×
3	Friends/Family/Colleagues	90	67	√	78	71	√	12	43	×
4	Private Computer Training	90	67	√	80	73	√	14	50	√
5	Workshops/Seminars/Conferences	72	53	√	74	67	√	11	39	×
6	Coaching/Mentoring	51	37	×	36	33	×	5	18	×
7	Study/Sabbatical Leave	9	7	×	6	5	×	3	11	×
8	Formal Continuing Education	27	20	×	18	16	×	5	18	×

**Source: Field Survey, 2019** D= Decision √ = Accepted × = Rejected

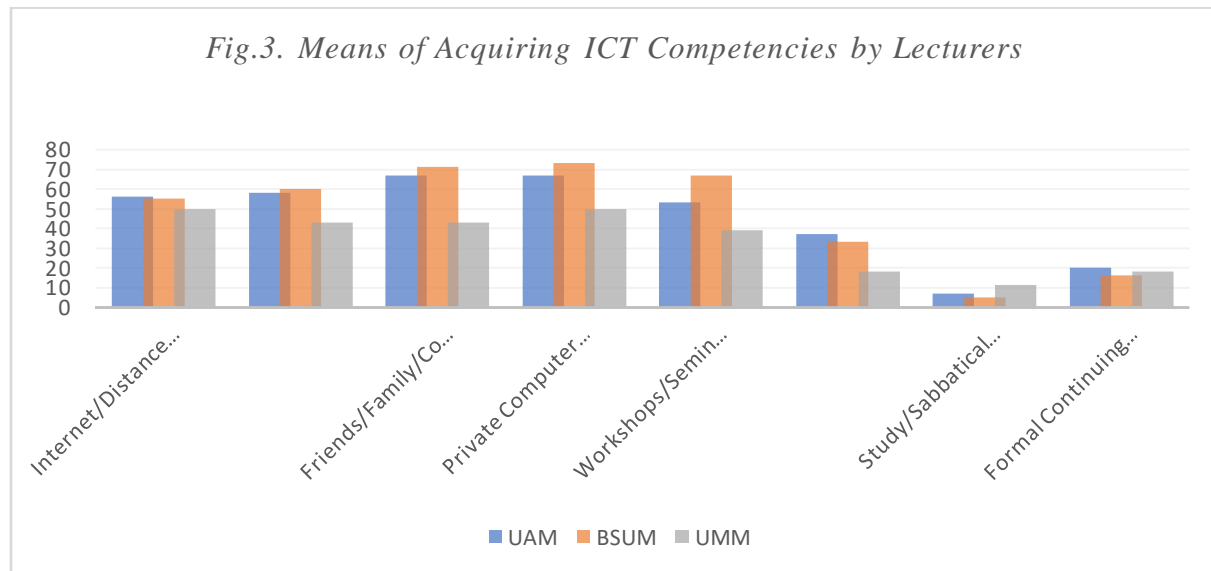


Table 4.6 and Figure 4.2 plainly exhibited various means through which the university lecturers acquire ICT competencies in Benue State. In UAM and BSUM, Internet/Distance learning (56%, 55%), Computer Assisted Instructions (58%, 60%), Friends/Family/Colleagues (67%, 71%),

Private Computer Training (67%, 73%), Workshops/Seminars/Conferences (53%, 67%) were higher than the 50% benchmark. While in UMM, Internet/distance learning (50%) and private computer training (50%) exceeded 50% yardstick. On the other hand, coaching/mentoring, formal continuing education and study/sabbatical leave were the least in the three studied universities in Benue State.

It can, therefore, be concluded that friends/family/colleagues, private computer training, computer-assisted instructions, Internet/distance learning, and workshops/seminars/conferences are the major means through which lecturers in the universities in Benue State acquire ICT competencies. This suggests that the lecturers principally develop their ICT competencies through self-effort or personal training; probably as a result of limited or no defined opportunities of formal ICT training granted to the lecturers by their institutions and government. The glaring difference in the means of developing ICT competencies between UMM and UAM and BSUM could be due to lack of adequate commitment of the institution in exposing her staff to the competencies required to exploit modern technologies that proved to be consequential in smoothening teaching and research processes. This may also be attributable to the dearth of funds needed to sponsor staff training.

The outcome of this study is in face with that of Omotunde (2017) who discovered that the majority of the lecturers were not formally trained on the use of ICT rather they acquire their skills independently and through the help of their friends and associates in their workplace. University management can actually take advantage of this discovery to sponsor competent associates of lecturers at the workplace to coach and mentor them in ICT skills.

By implication, lecturers would be more competent in using EIRs through ICT enabling devices, if their respective universities fully assume the responsibility of deliberately exposing them to

the needed formal ICT training. This would go a long way in enhancing their pedagogical practices and positively affect their research productivity as well as influence Nigerian universities ranking at the global level.

### 4.3.3 Level of ICT Competencies Possessed by Lecturers

This section sought to ascertain the level of ICT competencies possessed by lecturers in the three universities under study. Several elements make up ICT competencies, but this study under this section only considered knowledge and skills as indices of ICT competence.

#### 4.3.2.1 Level of ICT Knowledge Possessed by Lecturers

Table 4.3. Level of ICT Knowledge Possessed by Lecturers N=135, 110, 28

S/N	ICT Knowledge	Univ.	VH	H	L	VL	Mean	SD	D
1	I know how to start /shut down different types of computer	<b>UAM</b>	135	0	0	0	4.00	0.00	A
		<b>BSUM</b>	90	16	2	2	3.76	0.57	A
		<b>UMM</b>	21	3	3	1	3.57	0.84	A
2	I know how to use storage devices like flash drive, Hard disk, CD, diskette etc.	<b>UAM</b>	126	9	0	0	3.93	0.25	A
		<b>BSUM</b>	74	22	12	2	3.53	0.76	A
		<b>UMM</b>	18	8	0	2	3.50	0.84	A
3	I know how to create/manage files and folders on a computer	<b>UAM</b>	117	12	3	3	3.80	0.58	A
		<b>BSUM</b>	64	28	10	8	3.34	0.92	A
		<b>UMM</b>	13	8	0	7	2.96	1.23	A
4	I know how to use computer programs like Microsoft Packages	<b>UAM</b>	84	39	9	3	3.51	0.72	A
		<b>BSUM</b>	48	38	16	8	3.14	0.93	A
		<b>UMM</b>	16	5	2	5	3.14	1.18	A
5	I know how to create documents in diverse formats with a computer	<b>UAM</b>	114	12	3	6	3.73	0.71	A
		<b>BSUM</b>	60	30	14	6	3.30	0.89	A
		<b>UMM</b>	13	7	4	4	3.03	1.11	A
6	I know how to use communication platforms like email,Internet, networks, etc.	<b>UAM</b>	117	18	0	0	3.87	0.34	A
		<b>BSUM</b>	72	24	12	2	3.50	0.76	A
		<b>UMM</b>	12	9	2	5	3.00	1.12	A

**Source: Field Survey, 2019** VH=Very High, H=High, L=Low, VL=Very Low, A=Agreed, D=Decision, SD=Standard Deviation

Table 4.3 explicitly presents the level of ICT knowledge possessed by lecturers in the universities in Benue State. Using the benchmark mean of 2.50, the respondents agreed on all the items

above the mean rating of 2.50. It can, therefore, be deduced that university lecturers in Benue State possessed high ICT knowledge in all the outlined ICT operations. This could be attributed to their day-to-day formal or informal exposure to ICT facilities within and outside university environments.

The finding supported the view of Amua-Sekyi and Asare (2016) that lecturers with enough knowledge about ICT are more prepared and able to integrate computer and related technologies in teaching. The era of lecturers becoming successful in their various branches of learning without ICT knowledge is gone, because ICT has already become a dire necessity in every professional practice. This finding also corroborates that of Ojeniyi and Adetimirin (2016) who discovered in their study that lecturers in Ajayi Crowther University and Lead City, Oyo have high ICT knowledge in general computer operations (76.9%). Also, the result further firmed up the standpoint of Kpolovie and Awusaku (2016) who averred that real success in today's rapidly changing and highly competitive world depends on ICT knowledge and skills. This suggests that the lecturers, with their comfortable level of ICT knowledge, stand a better chance of becoming successful in research and teaching if their ICT knowledge can be translated into practical skills for reaping the manifold benefits afforded by electronic information resources.

The implication of this finding is that lecturers' high ICT knowledge in ICT operations would greatly influence their ICT skills acquisition, because skills can only be developed upon a deep foundation of knowledge. This is expected to motivate universities to support their lecturers build ICT skills on this firm foundation of knowledge. Otherwise, ICT knowledge alone will not result in the effective use of electronic information resources for teaching and research.

#### **4.3.2.2 Levels of ICT Skills Possessed by Lecturers**

Under this section, the researcher was concerned with finding out the level to which the ICT knowledge of lecturers is translated into practical skills that can be applied in using electronic information resources for teaching and research. The responses of the respondents are tabulated below:

Table 4.4a. Basic ICT Skills Possessed by Lecturers N=135,110,28

S/N	Skills	Univ.	VH	H	L	VL	Mean	SD	D
1	Wordprocessing Skill (i.e. MS Word)	UAM	108	27	0	0	3.80	0.40	A
		BSUM	58	38	12	2	3.38	0.75	A
		UMM	14	8	2	4	3.14	1.08	A
2	Presentation Skill (i.e. MS PowerPoint)	UAM	75	51	6	3	3.47	0.69	A
		BSUM	46	36	24	4	3.14	0.87	A
		UMM	7	8	9	4	2.64	1.03	A
3	Spreadsheet Skill (i.e. MS Excel).	UAM	51	60	15	9	3.13	0.86	A
		BSUM	28	34	36	12	2.70	0.97	A
		UMM	5	7	8	8	2.32	1.09	D

Source: Field Work, 2019 D= Disagreed

In Table 4.4a above, lecturers in the universities in Benue State were assessed on their level of competence with basic ICT skills. Judging against the standard mean of 2.50, the respondents in UAM and BSUM agreed on wordprocessing, presentation skill and spreadsheet above the mean rating of 2.50. While respondents in UMM only settled on wordprocessing and spreadsheet above the mean rating of 2.50. The disparity in spreadsheet skills suggests that the lecturers in UMM are deficient in skills vital for using computation programs.

Table 4.4b. Intermediate ICT Skills Possessed by Lecturers N=135,110,28

S/N	Skills	Univ.	VH	H	L	VL	Mean	SD	D
4	Database Searching Skill	UAM	66	45	15	9	3.24	0.90	A
		BSUM	38	44	14	14	2.96	0.99	A
		UMM	6	4	8	10	2.21	1.17	D
5	Internet Surfing Skill	UAM	75	42	9	9	3.35	0.88	A
		BSUM	56	34	10	10	3.23	0.96	A
		UMM	11	5	4	8	2.68	1.28	A
6	Web Content Creation Skill	UAM	36	30	39	30	2.53	1.11	A
		BSUM	14	22	44	30	2.18	0.98	D

**UMM    4    7    6    11    2.14    1.11    D**

In Table 4.4a above, lecturers in the universities in Benue State were assessed on their level of competence with intermediate ICT skills. Internet surfing received the mean response above 2.50 in the three universities. Database searching was agreed upon with a mean rating above 2.50 by respondents in UAM and BSUM only. Whereas web content creation recorded mean rating above 2.50 in UAM only. However, database searching received mean responses below 2.50 in UMM while respondents in both BSUM and UMM did not agree with web content creation as responses recorded on them were below 2.50

Table 4.4c. Advanced ICT Skills Possessed by Lecturers

S/N	Skills	Univ.	VH	H	L	VL	Mean	SD	D
7	Programming Skill	UAM	15	24	66	30	2.17	0.91	D
		BSUM	18	16	44	42	2.01	0.99	D
		UMM	3	6	14	5	2.25	0.89	D
8	Networking Skill	UAM	24	30	54	27	2.37	0.99	D
		BSUM	16	38	28	28	2.38	1.02	D
		UMM	6	14	8	7	2.42	1.10	D
9	Technical Skill	UAM	24	12	33	66	1.95	1.14	D
		BSUM	2	10	36	62	1.56	0.74	D
		UMM	2	5	12	9	2.00	0.90	D

In Table 4.4c above, lecturers in the universities in Benue State were assessed on their level of competence with advanced ICT skills. Using the benchmark mean of 2.50, the respondents in the three universities disagreed on all the items below the benchmark mean of 2.50.

Based on the levels of ICT competencies for developing countries expounded by Akoojee *et al.*, (2008), it can be concluded that lecturers in the universities in Benue State possessed both basic and intermediate ICT skills such as word processing, presentation (PowerPoint), spreadsheet (excel), Internet surfing and database searching. This hints that Nigerian universities are increasingly bridging up the digital divide reported decades ago. This finding is in line with Amua-Sekyi and Asare (2016) who revealed that the level of ICT competencies of lecturers was

good in Wordprocessing, accessing the Internet and PowerPoint presentation. This finding equally proved to be an improvement over the position of Ngare (2007), which was supported by Ojeniyi and Adetimirin (2016) that many Nigerian university lecturers lack relevant ICT skills. The need to remain academically vibrant in this current age and increased workload has awakened Nigerian lecturers' willingness to acquire ICT skills.

By implication, since the level of ICT competencies of lecturers is not advanced, they can maximally benefit from EIRs that are packaged and presented in the simplest form. Too many technicalities incorporated in searching, locating and retrieving EIRs can hinder their access to such resources; and this would in return, affect their teaching and research productivity. In other words, information expected to be consumed by lecturers ought to be created and packaged in a way that acknowledges their different levels of ICT competencies so as to ensure users from all. However, lecturers must not be contented with basic ICT skills because technology is constantly getting more complex, and to move along with the growing trend requires an incessant upgrade.

#### **4.3.4 The Extent of Applying ICT Competencies by Lecturers**

The researcher was interested in determining the extent to which lecturers apply ICT competencies they possessed in using electronic information resources for teaching and research.

The responses are presented below:

Table 4.5. The extent of Applying ICT Competencies by Lecturers N=135,110, 28

S/N	Skills	Univ.	HD	AD	RD	ND	Mean	SD	D
1	Wordprocessing skill (i.e. MS Word)	UAM	96	24	6	9	3.53	0.86	A
		BSUM	56	36	12	6	3.29	0.87	A
		UMM	13	11	2	3	3.25	0.89	A
2	Presentation skill (i.e. MS PowerPoint)	UAM	75	42	6	12	3.33	0.92	A
		BSUM	44	42	16	8	3.10	0.91	A
		UMM	6	10	7	5	2.60	1.03	A
3	Spreadsheet skill (i.e. MS Excel)	UAM	48	39	30	18	2.86	1.05	A
		BSUM	30	34	36	10	2.76	0.96	A
		UMM	4	9	7	8	2.36	1.06	D
4	Database Searching Skill	UAM	54	33	30	18	2.91	1.08	A
		BSUM	40	42	18	10	3.01	0.95	A
		UMM	5	8	4	11	2.25	1.17	D
5	Internet surfing skill	UAM	81	27	9	18	3.26	1.07	A
		BSUM	56	22	24	8	3.14	1.00	A
		UMM	9	9	4	6	2.75	1.14	A
6	Web content creation Skill	UAM	33	24	36	42	2.35	1.16	D
		BSUM	6	28	52	24	2.14	0.82	D
		UMM	1	8	7	12	1.92	0.94	D
7	Programming skill	UAM	18	18	51	48	2.04	1.01	D
		BSUM	6	18	48	38	1.92	0.85	D
		UMM	2	8	9	9	2.10	0.96	D
8	Networking Skill	UAM	33	27	42	33	2.44	1.11	D
		BSUM	8	38	40	24	2.27	0.89	D
		UMM	3	13	7	5	2.46	0.92	D
9	Technical skill	UAM	24	27	24	60	2.11	1.16	D
		BSUM	4	10	48	48	1.72	0.78	D
		UMM	1	9	9	9	2.07	0.89	D

Source: Field Survey, 2019, HD =Highly Applied, AD =Averagely Applied, RD =Rarely Applied, ND =Never Applied, D=Decision, D=Disagreed

Table 4.5 explicitly showcase the extent to which the university lecturers in Benue State apply ICT competencies in using electronic information resources. In UAM, respondents agreed to the application of wordprocessing skill (M=3.53, SD=.86), presentation skill (M=3.33, SD=.92), spreadsheet skill (M=2.86, SD=1.04), Database Searching (M=2.91, SD=1.11) and Internet surfing (M=3.26, SD=1.06) above the benchmark mean of 2.50. The respondents in BSUM applied wordprocessing (M=3.29, SD=.87), presentation skill (M=3.10, SD=.91), spreadsheet skill (M=2.76, SD=.96), database searching skill (M=3.01, SD=.95) and Internet surfing (M=3.14, SD=.1.00) above the mean rating of 2.50. While in UMM, respondents agreed on wordprocessing skill (M=3.25, SD=.86), presentation skill (M=2.60, SD=1.03) and Internet surfing skills (M=2.75, SD=1.14) above the benchmark mean of 2.50. Conversely, programming, networking and technical skills were the least items in UAM, BSUM, and UMM with mean responses below the standard mean of 2.50

Arising from the above result, it can be said that the lecturers averagely demonstrates skills such as wordprocessing, PowerPoint presentation, Internet surfing, spreadsheet and database searching in using electronic information resources. This result exposes the fact that the extent to which lecturers use EIRs is greatly dependent on their level of ICT competencies. The more they develop their ICT competencies, the more they increase the depth of their capacity in using EIRs. This finding is in consonance with Archibong *et al* (2010) who discovered Wordprocessing in their study as the highest area of ICT competencies applied by lecturers. Similarly, this result validates the discovery of Amua-Sekyi and Asare (2016) who figured out in a study conducted in Ghana, that lecturers greatly proved their ICT competencies in accessing the Internet and preparing PowerPoint presentations. The fact that Powerpoint presentation makes teaching real,

and enhance the presentation of information may have contributed to it becoming one among the highest areas of ICT competencies application by the lecturers.

The implication of this finding is that online databases, electronic journals, e-books and e-reference resources which are available in the three studied universities, as presented in Table 4.1 and Fig. 4.1 would be used to some extent since the application of their ICT competencies stands at average. This would go a long way in improving their access to knowledge, keeping them current in their scholarship and disseminating new information to students under their tutelage

#### 4.3.5 Challenges in Applying ICT Competencies by Lecturers

Under this section, the researcher was interested in identifying the challenges that confront lecturers in their efforts to exercise ICT competencies in putting EIRs to productive use. The responses are tabulated below:

Table 4.7. Challenges in Applying ICT Competencies by Lecturers

S/N	Challenges	UAM			BSUM			UMM		
		F	%	D	F	%	D	F	%	D
1	Lack of ICT Training	93	68	√	64	58	√	16	57	√
2	Too Much Regulations	21	15	×	22	20	×	7	25	×
3	Inadequate ICT Facilities	108	80	√	94	85	√	17	60	√
4	Unstable Power Supply	123	91	√	98	89	√	17	60	√
5	Lack of Fund	90	66	√	56	50	√	16	57	√
6	Poor Internet Connectivity	117	86	√	86	78	√	15	53	√
7	Too Much Official responsibilities	24	18	×	52	47	×	7	25	×

**Source:** Field Work, 2019     √ = Accepted    **D** = Decision    × = Rejected

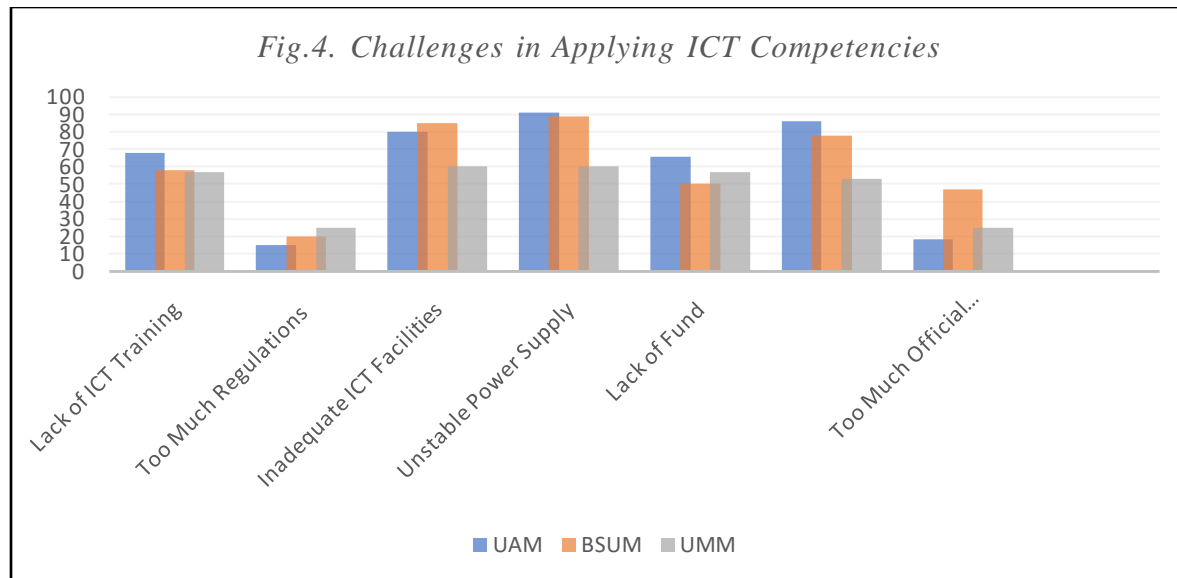


Table 4.7 and Figure 4.3 simply presented the challenges which the lecturers encounter in applying ICT competencies for electronic information resources usage in Universities in Benue State. The respondents in the three studied universities agreed on inadequate ICT facilities, unstable power supply, poor Internet connectivity, lack of ICT training and fund above the 50% benchmark. However, “too many regulations and official responsibilities” received responses below the 50% benchmark in the three universities. These universities are facing similar challenges.

From this finding, it is, therefore, logical to conclude that inadequate ICT facilities, unstable power supply, poor Internet connectivity, lack of ICT training and fund are the challenges that the lecturers are confronted within the course of applying ICT competencies for electronic information resources usage. Apart from ICT training and fund, facility-related challenges are the major drawbacks constituting stumbling blocks to effective integration of technology in using electronic information resources by lecturers. These challenges might have contributed to the average application of ICT competencies by the lecturers. The outcome of this study does not support Nwachukwu and Asom (2015) who uncovered that too much workload for academic

staff hinders them from applying their computer skills. The computer ought to be an escape route in the midst of extra workload. On the other, the study aligns with their finding on inadequate power supply as one of the major challenges of exploiting computers for academic activities by lecturers. The study also supported Archibong *et al* (2010), Ojeniyi and Adetimirin (2016) who uncovered that poor Internet connection and limited ICT facilities stand as great impediments to applying ICT skills in utilizing electronic information resources by lecturers.

By implication, if ICT facilities that aid access to EIRs are limitedly available, there would be limited or no access to EIRs even by competent lecturers. The effective use of EIRs may considerably reduce among the universities in Benue State, except these challenges are timely surmounted. The money spent on the subscription of online databases may attract minimal value to the intellectual system of the universities. The end result would be wane in the excellence of teaching and research.

#### **4.4 Hypotheses Testing**

This section presents the result of the inferential statistics used to test the null hypotheses formulated for this study. The hypotheses were tested using One-Way Analysis of Variance (ANOVA) with the aid of Statistical Package for Social Science (see appendix VIII and IX). The objective was to establish if there is any significant difference in the lecturers' level of ICT competencies and the extent of ICT competencies application in federal, state and private universities in Benue State.

##### **4.4.1 Hypothesis One**

H01: There is no significant difference in the level of ICT competencies possessed by the lecturers in using EIRs for teaching and research in the Federal, State and Private Universities in Benue State.

Table 4.8. ANOVA Result on Difference in the Level of ICTCompetencies of Lecturers in the Federal, State and Private Universities in Benue State.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1005.085	2	502.543	4.451	.013
Within Groups	30487.728	270	112.918		
<b>Total</b>	<b>31492.813</b>	<b>272</b>			

**Source: IBM SPSS Analysis**

Significance level .05\*

The result clearly indicates that there is a statistically significant difference in the level of ICT competencies of lecturers in the federal, state and private universities in Benue State as determined by one-way ANOVA [ $F(2,270)=4.451, p = .013$ ]. Consequently, the null hypothesis has been rejected. In order to establish where the difference existed, post hoc comparison using the Tukey test was carried out. The test revealed that there is no significant difference ( $p = .110$ ) in the level of ICT competencies of lecturers in the federal (UAM) and state (BSUM) universities in Benue State. Whereas, there is a significant difference ( $p = .022$ ) in the level of ICT competencies of lecturers in the federal and private universities in Benue State. This result conflict with the wide claims (Izuagbe *et al*, 2016; Iroaganachi and Izuagbe, 2018) that lecturers in private universities have a breakthrough in ICT competence than their state and federal counterparts. However, the difference found in this study may be so because the private university is fledgeling, and lacks financial buoyancy to adequately deploy ICTs and subject her lecturers to quality ICT training like the age-long federal and state universities. By implication, the difference would reflect in the level of their electronic information resources utilization as well as their job performance in areas of teaching and research.

#### 4.4.2 Hypothesis Two

H<sub>02</sub>: There is no significant difference in the extent of applying ICT competencies in using EIR for teaching and research by the lecturers in the Federal, State and Private Universities in Benue State.

Table 4.9. ANOVA Result on Difference in the Extent of Applying ICT Competencies by Lecturers in the Federal, State and Private Universities in Benue State.

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	282.223	2	141.111	2.115	.123
Within Groups	18011.250	270	66.708		
<b>Total</b>	<b>18293.473</b>	<b>272</b>			

**Source: IBM SPSS Analysis**

Significance level .05\*

Table 4.9 clearly shows that there is no statistically significant difference in the extent of applying ICT competencies by lecturers in the Federal, State and Private Universities in Benue State as determined by one-way ANOVA [ $F(2, 270) = 2.115, p = .123$ ]. Therefore, the null hypothesis has been retained. Coming to the extent of applying ICT competencies, there is no difference between the private university and the federal and state universities in Benue State. The absence of significant disparity in the extent of applying ICT competencies by lecturers points to the fact that irrespective of the type of university, the effectiveness and efficiency associated with ICT has made lecturers to equally rely on it to improve teaching and research in universities. It also implies that possessing ICT competencies do not guarantee its application except variables like availability of ICT facilities, Internet connectivity and steady power supply (see Table 4.7 and Fig.4.) are properly harnessed.

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## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION, AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter provides a summary of the study, a summary of the major findings, contributions to knowledge, limitations of the study, conclusion, recommendations, and suggestions for further studies.

#### **5.2 Summary of the Study**

The research was carried out to assess the lecturers' ICT competencies in the use of electronic information resources for teaching and research in the universities in Benue State, Nigeria. To achieve this, five research questions were raised in the first chapter. The research questions sought to identify the types of electronic information resources available; means through which the lecturers acquire ICT competencies; the level of ICT competencies of lecturers; the extent to which lecturers demonstrate ICT competencies; and the challenges faced by the lecturers in applying ICT competencies in the course of using electronic information resources for teaching and research.

Chapter two of this study dwelled mainly on the review of related literature according to the following headings: conceptual clarification; types of electronic information resources; means of acquiring ICT competencies by lecturers; levels of ICT competencies possessed by lecturers; the extent of applying ICT competencies by lecturers; challenges to applying ICT competencies in using EIRs by lecturers; and summary of the review.

Chapter three of the study addressed the research methodology. The quantitative research method was preferred for the study while a cross-sectional survey research design was adopted. The targeted population was lecturers in the three full-time universities in Benue State; namely, University of Agriculture, Makurdi; Benue State University, Makurdi; and University of Mkar, Mkar, with a total number of one thousand five hundred and thirty-seven (1, 537) lecturers. Out of this population, three hundred and six (306) lecturers were drawn as samples according to Krejcie and Morgan's table of determining sample size and were used for the study. Cluster and simple random sampling were preferred for sample selection. The questionnaire was used as the instrument for data collection. In order to establish the validity of the instrument, the questionnaire was presented to experts for face and content validity, and the reliability of the instrument was obtained through the pilot study conducted in Ahmadu Bello University, Zaria. A reliability level of 0.98 was obtained.

In chapter four, the data collected from the respondents were sorted, organized, presented and analyzed using descriptive statistics while the two hypotheses were tested by means of inferential statistics.

Finally, chapter five dealt with the summary of the study and major findings, conclusion and recommendations

### **5.3 Summary of the Major Findings**

The summary of the major findings of the study are as follow:

1. Electronic journals, online databases, electronic books, and e-reference sources are the electronic information resources available to lecturers for teaching and research in the three universities studied

2. The major means through which lecturers in the universities in Benue State develop ICT competencies are friends/family/colleagues, private computer training, computer-assisted instructions, Internet/distance learning, and workshops/seminars/conferences.
3. Lecturers in the universities in Benue State possessed both basic and intermediate levels of ICT competencies such as word processing, presentation (PowerPoint), spreadsheet (excel), Internet surfing and database searching.
4. The extent to which lecturers in the universities in Benue State demonstrate ICT competencies in using electronic information resources stand at average.
5. The challenges that confront lecturers in applying ICT competencies for electronic information resources usage are inadequate ICT facilities, unstable power supply, poor Internet connectivity, lack of ICT training and fund
6. The first null hypothesis was rejected since it revealed that there is a statistically significant difference ( $p = .013$ ) in the level of ICT competencies of lecturers in the federal, state and private universities in Benue State.
7. The second null hypothesis was retained since it uncovered that there is no statistically significant difference ( $p = .123$ ) in the extent of applying ICT competencies by lecturers in the federal, state and private universities in Benue State.

#### **5.4 Contributions to Knowledge**

To the best knowledge of the researcher, this study was the first research conducted to ascertain the level of ICT competencies of lecturers in universities with particular focus on their use of electronic information resources. The main contributions to knowledge are:

This research work contributed to the paucity of literature in this area of study, especially in the context of Benue State. It discovered that university lecturers in Benue State possess basic and

intermediate ICT competencies and are averagely applied to use Electronic Information Resources for research and teaching. There is no study, apart from this, known to the researcher, which has determined the level of lecturers' ICT competencies in relation to the use of Electronic Information Resources for research and teaching in the universities in Benue State.

The work also contributed to the body of knowledge by revealing that the lecturers in the studied universities are deficient in advance ICT competencies. This would provide a basis for training for private ICT firms, professional bodies, and government agencies interested in the development of lecturers' ICT competencies.

### **5.5 Limitations of the Study**

There is no complete work done without limitations. The industrial action embarked upon by the Academic Staff Union of Universities (ASUU) from November 2018 to February 2019 largely delayed data collection for this study and thus hindered its timely completion. Another limitation was the refusal and reluctance of several lecturers in filling the research questionnaires. Lastly, the use of perception to discover the ICT competencies of lecturers was a limitation as some of them might not be very honest in disclosing their actual level of competence. The perception of knowledge and ability in ICT do not always match reality. Testing their level of ICT competencies through observing them as they perform practical tasks would have been the best option.

### **5.6 Conclusion**

Premised on the result of the study, it was concluded that lecturers in the three full-time universities in Benue state possess basic and intermediate ICT competencies, suggesting their deficiency in advance ICT competencies. The lecturers averagely apply ICT competencies in the use of EIRs such as electronic journals, online databases, e-books, and e-reference sources, thus

enhancing their statutory responsibilities of teaching and research. However, unstable power supply, poor Internet connectivity, lack of ICT training, inadequate ICT facilities and fund consisted the main challenges that confront the lecturers in their effort to apply ICT competencies for the purpose of using electronic information resources to increase the excellence of teaching and research in their parent universities.

## **5.7 Recommendations**

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

1. The management of respective university libraries in Benue State should work toward developing Digital Institutional Repositories (DIR) for their institutions. This would provide sustainable access to relevant scholarly outputs in addition to the available ones.
2. The university management should ensure the creation of the faculty committee that would be responsible for planning ICT training programs for faculty lecturers. Such training programs should concentrate more on intermediate and advance ICT competencies.
3. Professional librarians who are ICT inclined should offer more personalized support services to lecturers that need training in ICT to be able to use electronic information resources for quality teaching and research.
4. The government at both federal and state levels should show more commitment to the development of ICT competencies of lecturers by making available ICT grants to the universities and lecturers on an annual basis.

5. Both government and university managements should prioritize investment in ICT facilities, stable power supply, and sound Internet connectivity which are fundamental in exploiting electronic information resources.

### **5.8 Suggestions for Further Studies**

Below are some other areas of the study that can further be explored by other researchers:

1. Assessment of Lecturers' ICT Competencies in the Use of Electronic Information Resources for Teaching and Research in the Polytechnics in Benue State.
2. Assessment of Lecturers' ICT Competencies in the Use of Electronic Information Resources for Teaching and Research in the Colleges of Education in Benue State.

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## **APPENDIX I**

**INTRODUCTORY LETTER TO THE REGISTRAR OF UNIVERSITY OF  
AGRICULTURE, MAKURDI**



**DEPARTMENT OF LIBRARY AND INFORMATION SCIENCE  
AHMADU BELLO UNIVERSITY, ZARIA, NIGERIA**



Vice Chancellor: Professor Ibrahim Garba, B.Sc. (Hons) Geology, M.Sc. (Mineral Exploration) ABU, Ph.D Geology (London), D.J.C., FNMGS

Ag. Head of Department: Dr. Mohammed Habibu, NCE (Niger), BLIS, MLIS, Ph.D (ABU), CLN, TRC

e-Mail: [lis@abu.edu.ng](mailto:lis@abu.edu.ng)

Tel: 08174568401/09033706447

P16EDLS8163

16<sup>th</sup> April, 2018

The Registrar,  
Federal University of Agriculture Makurdi,  
Benue State

Dear Sir,

**INTRODUCTORY LETTER: TOR, SHIEKUMA FELIX**

This is to certify that TOR, SHIEKUMA FELIX with Registration Number **P15EDLS8163** is a Postgraduate Student in this Department. He is currently engaged in a research titled "**ICT Competencies of Lecturers in the Utilization of electronic Information Resources Among University Libraries In Benue State**". We would be grateful if you could kindly give him the assistance he requires for conducting the research work successfully.

Thanks for your cooperation.

Yours sincerely,

Dr. Habibu Mohammed  
Head of Department

Vice Chancellor: Professor Ibrahim Garba, B.Sc. (Hons) Geology, M.Sc. (Mineral Exploration) ABU, Ph.D. Geology (London), D.L.C., FNMGS  
Ag. Head of Department: Dr. Mohammed Habibu, NCE (Niger), BLIS, MLIS, Ph.D (ABU), CLN, TRC  
e-Mail: lis@abu.edu.ng

Tel: 08174568401/09033706447

P16EDLS8163

16<sup>th</sup> April, 2018

The Registrar,  
Benue State University,  
Benue State

Dear Sir,

**INTRODUCTORY LETTER: TOR, SHIEKUMA FELIX**

This is to certify that TOR, SHIEKUMA FELIX with Registration Number **P15EDLS8163** is a Postgraduate Student in this Department. He is currently engaged in a research titled "**ICT Competencies of Lecturers in the Utilization of electronic Information Resources Among University Libraries in Benue State**". We would be grateful if you could kindly give him the assistance he requires for conducting the research work successfully.

Thanks for your cooperation.

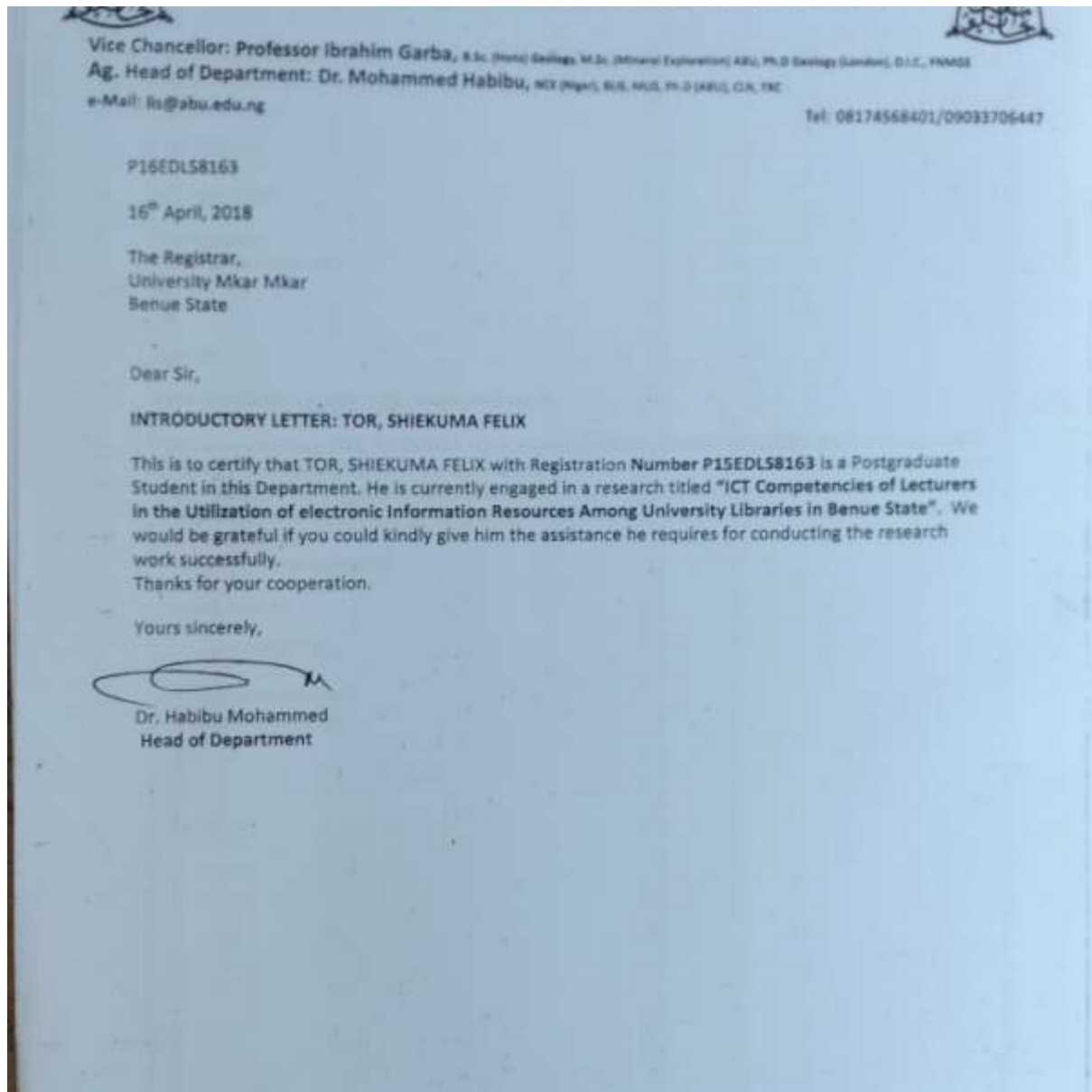
Yours sincerely,



Dr. Habibu Mohammed  
Head of Department

**APPENDIX III**

**INTRODUCTORY LETTER TO THE REGISTRAR UNIVERSITY OF MKAR,  
MKAR**



**APPENDIX IV**

**KREJCIE AND MORGAN TABLE OF DETERMINING SAMPLE SIZE**

Population	Sample	Population	Sample	Population	Sample
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	<b>1500</b>	<b>306</b>
30	28	260	155	1600	310

35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	100000	384

## APPENDIX V

### LETTER TO THE RESPONDENTS

Department of Library and Information Science,  
Ahmadu Bello University,  
Zaria-Nigeria.

March, 2019.

Dear Respondent,

**RESEARCH QUESTIONNAIRE**

I am a post-graduate student of the afore named department and institution presently conducting a research on *“Assessment of Lecturers’ ICT Competencies in the Use of Electronic Information Resources for Teaching and Research in Universities in Benue State, Nigeria”*.

Kindly complete the questionnaire to the best of your ability. All answers would be treated confidentially and used for academic purposes only.

Thank you very much in anticipation of your full co-operation.

Yours Faithfully

**TORSHIEKUMA FELIX  
P16EDLS8163**

**APPENDIX VI**

**RESEARCH QUESTIONNAIRE**

**SECTION A: Demographic Information**

Answer by ticking (√) or filling the blank spaces provided.

Name of Institution:

University of Agriculture, Makurdi

Benue State University, Makurdi

University of Mkar, Mkar

**SECTION B: Types of Electronic Information Resources Available**

1. Which of the following electronic information resources are available for use in your institution? **Tick as many as applicable**

- 1. Online Databases [     ]
- 2. Electronic Journals [     ]
- 3. Electronic Books [     ]
- 4. Electronic Reference Sources [     ]
- 5. CD-ROM Databases [     ]
- 6. Online Public Access Catalogues [     ]
- 7. Electronic Thesis and Dissertation [     ]
- 8. Open Educational Resources [     ]
- 9. Digital Institutional Repository [     ]
- Others (Please specify) .....

**SECTION C: Means of Acquiring ICT Competencies by Lecturers**

2. Which of the following means do you acquire ICT competencies? **Tick (√) as many as applicable**

- 1. Internet/distance learning [     ]
- 2. Computer Assisted Instructions (CAI) [     ]
- 3. Friends/Family/Colleagues [     ]
- 4. Private Computer Training [     ]
- 5. Workshops/Seminars/Conferences [     ]
- 6. Coaching/mentoring [     ]
- 7. Study/sabbatical leaves [     ]
- 8. Formal continuing education [     ]
- Others (please specify) .....

**SECTION D: Levels of ICT Competencies Possessed by Lecturers**

3. What is the level of your ICT knowledge? **Tick (√) as many as applicable**

S/N	Items	V.HIGH	HIGH	LOW	V.LOW
1	I know how to start /shut down different				

	types of computer				
2	I know how to use storage devices like flash drive, Hard disk, CD, diskette, etc.				
3	I know how to create/manage files and folders on a computer				
4	I know how to use computer programs such as Microsoft Packages				
5	I know how to create documents of diverse formats with a computer				
6	I know how to use communication platforms like email, Internet, networks, etc.				
	Others (specify)				

4. What is the level of your ICT skills? Tick (✓) as many as applicable

S/N	Basic Skills	V.HIGH	HIGH	LOW	V.LOW
1	Wordprocessing skill (i.e. MS Word)				
2	Presentation skill (i.e. MS PowerPoint)				
3	Spreadsheet skill (i.e. MS Excel)				
	Others (specify)				

S/N	Intermediate Skills	V.HIGH	HIGH	LOW	V.LOW
4	Database Searching Skill				
5	Internet surfing skill				
6	Web content creation skill				
	Others (specify)				

S/N	Intermediate Skills	V.HIGH	HIGH	LOW	V.LOW
7	Programming skill				
8	Networking Skill				
9	Technical skill				
	Others (specify)				

#### SECTION E: The Extent of Applying ICT Competencies by Lecturers

5. To what extent do you demonstrate ICT competencies (skills) in utilizing electronic information resources for teaching and research? Tick (✓) as many as applicable

S/N	Items	Highly Applied	Averagely Applied	Rarely Applied	Never Applied
1	Wordprocessing skill (i.e. MS Word)				
2	Presentation skill (i.e. MS PowerPoint)				
3	Spreadsheet skill (i.e. MS Excel)				
4	Database Searching Skill				
5	Internet surfing skill				
6	Web content creation skill				
7	Programming skill				
8	Networking Skill				
9	Technical skill				
	Others (specify)				

**SECTION F: Challenges in Applying ICT Competencies**

6. What are the challenges encountered in applying ICT competencies to utilize Electronic Information Resources? *Tick (√) as many as applicable*

- 1. Lack of ICT training [     ]
- 2. Too much regulations [     ]
- 3. Inadequate ICT facilities [     ]
- 4. Unstable power supply [     ]
- 5. Lack of fund [     ]
- 6. Poor Internet Connectivity [     ]
- 7. Too much official responsibilities [     ]
- Others (please specify) .....

**APPENDIX VII**  
**RELIABILITY TEST RESULT**

**Reliability**  
**Scale: ALL VARIABLES**

**Case Processing Summary**

		N	%
Cases	Valid	10	100.0
	Excluded <sup>a</sup>	0	.0
	Total	10	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.987	54

## APPENDIX VIII

### ANOVA RESULT ON DIFFERENCE IN THE LEVEL OF ICT COMPETENCIES OF LECTURERS IN THE FEDERAL, STATE AND PRIVATE UNIVERSITIES IN BENUE STATE

#### ANOVA

COMPETENCE

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1005.085	2	502.543	4.451	.013
Within Groups	30487.728	270	112.918		
Total	31492.813	272			

### Post Hoc Tests

#### Multiple Comparisons

Dependent Variable: COMPETENCE

Tukey HSD

(I) UNIVERSITY	(J) UNIVERSITY	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval
					Lower Bound
UAM	BSUM	2.75152	1.36490	.110	-.4652
	UMM	5.89762*	2.20663	.022	.6972

BSUM	UAM	-2.75152	1.36490	.110	-5.9682
	UMM	3.14610	2.24929	.343	-2.1548
UMM	UAM	-5.89762*	2.20663	.022	-11.0980
	BSUM	-3.14610	2.24929	.343	-8.4470

### APPENDIX IX

#### ANOVA RESULT ON DIFFERENCE IN THE EXTENT OF APPLYING ICT COMPETENCIES BY LECTURERS IN THE FEDERAL, STATE AND PRIVATE UNIVERSITIES IN BENUE STATE

#### ANOVA

EXTENT\_AC

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	282.223	2	141.111	2.115	.123
Within Groups	18011.250	270	66.708		
Total	18293.473	272			

### Post Hoc Tests

#### Multiple Comparisons

Dependent Variable: EXTENT\_AC

Tukey HSD

(I) UNI_BNS	(J) UNI_BNS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
UAM	BSUM	1.46667	1.04908	.343	-1.0057	3.9391
	UMM	3.11667	1.69605	.159	-.8804	7.1138

BSUM	UAM	-1.46667	1.04908	.343	-3.9391	1.0057
	UMM	1.65000	1.72884	.606	-2.4244	5.7244
UMM	UAM	-3.11667	1.69605	.159	-7.1138	.8804
	BSUM	-1.65000	1.72884	.606	-5.7244	2.4244