INFORMATION AND COMMUNICATION TECHNOLOGY UTILIZATION FOR OPEN AND DISTANCE LEARNING IN UNIVERSITIES IN SOUTH-WEST, NIGERIA

A Ph.D. Oral Defence

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A Ph.D. PRELIMINARY DEFENCE

BY

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A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the Degree of Doctor of Philosophy (Ph.D.) in Educational Technology in the Department of Educational Technology, University of Ilorin, Ilorin, Nigeria

2017

DECLARATION

I declare that this thesis, entitled "Information and Communication Technology Utilization for Open and Distance Learning in Universities in South-west, Nigeria", is my own work and has not previously been submitted by me or any other person for any course or qualification at this or any other tertiary institution. I also declare that as far as I am aware, all cited works have been acknowledged and referenced.

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CERTIFICATION

This is to certify that this study was carried out in the Department of Educational Technology, Faculty of Education, University of Ilorin, Ilorin, Nigeria by ABDULAZEEZ Muhammad Adewuyi (99/67QT002) in fulfillment of the award of Doctor of Philosophy (Ph.D.) Degree in Educational Technology.

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INFORMATION AND COMMUNICATION TECHNOLOGY UTILIZATION FOR OPEN AND DISTANCE LEARNING IN UNIVERSITIES IN SOUTH-WEST, NIGERIA

A Ph.D. Thesis

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DEDICATION

This research is dedicated to Almighty Allah, the Beneficent, and the Merciful.

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ABSTRACT

Information and Communication Technology (ICT) facilities form the main framework upon which Open and Distance Learning (ODL) depend for its development as an alternative way of learning, mainly for Adult. Literature has revealed that the use and integration of ICT in distance education for teaching and research have been major obstacles that may have impeded proper and full accomplishment of the programme. This study therefore investigated ICT Utilization for ODL in Universities in South-west, Nigeria. The Objectives were to: (i) determine the availability of ICT facilities for ODL; (ii) determine the lecturers' access to ICT facilities for ODL; (iii) examine the extent of lecturers' utilization of ICT facilities; (iv) identify institutional ICT policies and strategies for ODL; (v) identify factors that facilitate lecturers' ICT utilization; (vi) examine the influence of ICT accessibility on instructional delivery and research; (vii) identify factors hindering the utilization of ICT facilities for ODL; and (viii) determine whether differences exist in ICT utilization between dual mode and single mode universities

The study adopted quantitative research design of survey type. The population of lecturers was 1,984, out of which a sample of 693 lecturers; (394 males and 299 females) was purposively selected from four dual mode and one single mode universities. Data were collected through the administration of validated researcher-designed questionnaire. Percentages and mean scores were used to answer the research questions, while Analysis of Variance (ANOVA) was used to test the hypotheses

Findings of the study were that:

i. ICT facilities were available in ODL; (66.6% and mean of 1.33)
ii. ICT facilities were accessible by lecturers; (58.3%, mean of 1.42)
iii. ICT facilities were moderately utilized by lecturers; (57.4%, mean of 1.54)
iv. ICT policies were adequately formulated by ODL managements; (65.8%, mean of 2.07)
v. instructional delivery, research, online tutorial and counseling were factors that facilitated lecturers' ICT utilization for ODL; (77.4%, mean of 1.96)
vi. ICT accessibility highly influenced instructional delivery and research in ODL; (82.2%, mean of 1.76%)
vii. Network problem, poor funding, poor electricity and insufficient skill were factors hindering the utilization of ICT facilities for ODL; (77.9%, mean of 1.87); and
viii. there were significant differences between dual mode and single mode ODL on the availability of ICT; F (df 4,657) = 5.994, P= < 0.05); accessibility of ICT; F (df 4,657) = 20.063, P=< 0.05); utilization of ICT; F (df 4,657) = 21.087, P=< 0.05); institutional ICT policies and strategies; F (df 4,657) = 3.192, P= < 0.05). All significant at 0.05 significant level

The study concluded that though, majority of ICT facilities were available and accessible; a gap still existed among ODL universities on the availability, accessibility, utilization, institutional policies and strategies of ICT facilities. The implication is that if ICT facilities are properly utilized, there is likely to be an improvement in the instructional delivery and research in Open and Distance Learning. It was therefore recommended that university management should increase their investment in ICT facilities so as to attain world class Open and Distance Education.

CHAPTER ONE

INTRODUCTION

Background to the Study

As a worldwide trend, ODL has become an acceptable type of education in Africa and particularly in Nigeria, providing access to the teeming candidates who are denied admission into conventional universities in Nigeria. Research has shown that conventional education cannot meet the demand of the present day socio-educational situation, particularly for a developing country like Nigeria. Aluede and Idogho (2012)[117] reported that out of the number of candidates applying for admission every year in Nigeria, only about 5.2% to 15.3% get admitted every year; implying that about 84.7% to 98.8% of the candidates seeking admissions every year never got admitted into Nigeria universities. This low access to university education in Nigeria could be attributed to low infrastructural facilities, insufficient public financing, and economic constraints.

This lack of ability has brought about the issue of ODL as a resourceful and productive approach to the educational system. To deliver world acceptable best practices in ODL in Nigeria, ODL offers structural learning in which the facilitator and student are separated by time and space, making use of ICT resources as well as multimedia components such as computer and satellite transmission (Peat & Helland, 2002)[131].

The World Bank (2002)[134] defines distance education as a system of teaching and learning in which the learners are not needed to be physically present at an exact place during the period. Most often, regular mail is used to send written materials, video, audiotapes and CD-ROMs to the learners, to complete their exercises. At this point in time, e-mail, the web, video

conferencing and extensive network connection are also used. Students are required to assemble at a specific location on specific period for revision and write exams.

A basic feature of distance education is that it is a learners' centered. A learners centered education process is different from conventional teaching and learning process that make use of a wide array of tools to achieve learning outcomes. These tools are designed for self learning; they include printed course units, tutor, and computer marked assignment and feedback systems, radio and television broadcast, audio and videotapes and electronic mail among others. (Akinkunmi, Elizabeth, Oyinlola & Taofik, 2015)[117]

However, in a developing country like Nigeria, delivery of instruction through the distance mode presents major obstacles to educators. Access to and utilization of ICT facilities is extensively low. Therefore the influence of ICT in distance learning in a developing country like Nigeria requires serious appraisal. The need to recognize the potential effects of ICT in distance learning are necessary for all those involved in the development and delivery of distance education. ICT utilization is a viable option to improve distance learning in Nigeria. This may be unrealistic considering the various obstacles in the deployment of ICTs in ODL. (Akinkunmi, et al., 2015)[117]

The basic characteristic of ODL is the separation of instructor and learner in space and time. The NUC, the supervisory agency of university education in Nigeria, in an effort to ensure that standards are maintained in the operations of distance education enacted some policy. One of such is the provision that the ODL study centres should offer both academic and social support. It is compulsory for students and lecturers to have easy access to ICT facilities for

learning purposes. For definite programs, proficient internet access is required at all study centres (NUC, 2013)[128].

The accredited ODL institutions in Nigeria include:

i. The National Open University of Nigeria (NOUN)
ii. The Centre for Distance Learning (CDL), Obafemi Awolowo University
iii. The CDL University of Ibadan
iv. The CDL University of Abuja
v. The Distance Learning Institute (DLI) University of Lagos
vi. Federal University of Technology Yola
vii. Ahmadu Bello University, Zaria
viii. University of Maiduguri
ix. ODL Centre, Ladoke Akintola University of Technology (LAUTECH), Ogbomoso (Onwe, 2016) [130].

Among these universities, NOUN is presently the only single-mode university approved to run ODL in the delivery of university education (NUC, 2009)[128]. Akande and Sofowora (2011)[117] opined that ODL has been utilizing integrated media and multi-media technologies in teaching, using correspondence education directly complemented by lecturers, tutorial and counseling services organized through a network of local study centres called multi-site campus method. Akande and Sofowora (2011)[117] further submitted that NOUN is the first fully fledged university that operates in an extremely ODL mode of education in Nigeria.

Akande and Sofowora (2011)[117] further stated that the university focuses mostly on a distance teaching and learning system and distribute its course resources via print in combination with ICT formats, like CD-ROMs and on the bases of self learning. NOUN presently has 50

study centers, which are stratified into the six geopolitical zones of the Nation. Students' enrolment capacity is estimated at about 50,000 students. This figure is the reason to conclude that ODL mode of education holds a great vision as it increases capacity in the education sector (Akande & Sofowora, 2011).[117]

Trivelle (2015)[133] asserted that ICT is the key reason upon which ODL sustain its progress as an alternative way of learning primarily for adults. It helps the educational institutes to regulate to the constantly changing environment and support the learning process with the demands of the global market and the need for the adults who want to keep up with present knowledge of society and world market.

The effort by the federal and state governments to embark on open and distance education in Nigeria, the use and integration of ICT in distance education teaching and learning have been major obstacles that may have impeded proper accomplishment of the program by institution of higher learning . The facts seem clear that Nigeria is not yet ready in her preparedness to integrate ICT in all areas of her national economy (Ololube, 2006)[130].

The field of distance education has not been changed by the penetrating influence of ICT. Indisputably, ICTs have influenced the quality and quantity of teaching, learning, and research in distance education. Therefore, ICT avails distance education students, academic and non academic staff the opportunity to correspond with one another more efficiently during formal and non formal teaching and learning (Yusuf, 2005)[135]. This is the reason why distance education programs in Nigeria need to integrate ICTs into their program, because the quality of teaching using ICTs to gain access to information is known in almost all countries to be a key

predictor of teaching and research. (United Nations Educational Scientific and Cultural Organization [UNESCO], 2003)[134]

The federal government is anxious that for higher education to make best support to national development, ICT is an essential element through the integration of ICT in distance learning programs (Ololube, 2006)[130]Many educators have highlighted the guarantee of ICTs in distributing opportunities in ODL. Robinson (2008)[132] reported that distance education and ICTs have the potential to distribute opportunities for teaching and learning. Jimoh (2013)[124] opined that ODL, together with suitable ICTs has the power to impact considerably on educational content and delivery in open and distance education in Nigeria. Ayo, Mbarika, Ukrakpor, and Emebo (2011)[118] asserted that ODL is a formal education system that deploy ICT facilities to communicate, teach and facilitate dynamic learning among students who are domiciled in distant location.

Universities across the world have been adopting ICT for teaching and learning technologies in an attempt to create a conducive atmosphere for both students and their instructors for engaging in collaborative learning and increase access to information (Ifinedo, 2006)[123]. Access to information through ICT increases the information accessible to individuals to sustain them in trying new strategies, thinking and creativity that are thoughtful in practice aimed at engaging them to new innovation through the use of ICTs (Ololube, 2006)[130]. ICTs are indispensable and have been accepted as part of the modern world especially in developed societies. In fact, cultures and societies are adapted to meet the challenges of the knowledge age. The recognition of ICT has brought about quick changes in technology and has caused social, political, and global economic transformation (Nwachukwu, 2008)[129], Yusuf, 2005)[135].

UNESCO (2009)[134] described the term ICT as the system of technologies, tools and devices that are used to convey, process, store, generate, present, distribute, or exchange of information by electronic means. This extensive definition covers a wide group of technologies, such as computers and peripherals, video, radio, television, Compact Disk (CD), Digital Video Disk (DVD), telephone (mobile and fixed line), Personal Digital Assistants (PDA), digital cameras, satellite systems, network hardware and software, as well as equipment associated with these technologies such as video-conferencing, e-mail, web logs(blog), and social networks (such as Face book, my Space, and Twitters). The World Bank (2002)[135] defined ICT as constructing of hardware, software, networks and media for collection, storage, processing, transmission and presentation of information. ICTs are the only platform that provide access to electronic resources in the universities and therefore very crucial for qualitative instructional delivery. Moahi (2009)[127] opined that ICT tools have allowed information to be efficiently harnessed, accessed and utilized.

Rao (2012)[131] described ICT as a group of technologies by which a variety of support services shall be provided at different phases of student's learning life cycle in ODL. The phases begin with the admission phase: programme details, fees structure, admission procedure, registration and re-registration. The teaching and learning phase: learning schedule and programme delivery, lectures through video conferencing, audio and video programmes, multi-media presentation and case studies. The evaluation phase: examination schedule, internal and external assessment, examinations, improvement, and evaluation, re-evaluation, and result declaration. The certification phases: marks/grades, updates, certificate printing and issuing, and convocation schedule.

Rao (2009)[131] highlighted the ICT infrastructures in ODL such as: network infrastructures for example: network components such as routes network switches, standard

network cable (fiber and Unscheduled Trusted Pair (UTP), Wireless Connectivity (WIFI/WI-max). Computing infrastructures: Standard Computer Hardware (SCH), such as servers; database servers, web servers, backup/recovery servers, and application servers, personal computers (desktops, laptops, and notebooks) to access services, is also required in an institution. Stable system and applications software: provision of web technologies such as Linux, Apacha, MySQL, and PHP (LAMP). Learning Management System (LMS): such as Modular Object-Oriented Dynamic Learning Environment (MOODLE), LMS is a complete system that covers all phases of a student learning life cycle. Internet Service Provider (ISP) and Internet bandwidth: ODL institution needs internet bandwidth to access Web-based student learning and support services. The accessibility of the service of the institution will depend on the availability of internet bandwidth reserved in a particular institution. An ISP is the organization that provides internet bandwidth. Security infrastructures: the standard security devices are the firewall, Intrusion Detection System (IDS), Intrusion Prevention System (IPS) antivirus software, and other monitory systems.

There are diverse ICT tools that provide access to electronic resources in ODL. These tools include the computer, the internet, electronic network, the digital libraries and CD–ROM. Computer network consists of interconnection of two or more computer together to exchange information. The computer network that provides access to electronic resources in the ODL centers are LAN, which is the internet or the intranet, thus, the available ICT computer network in the center promotes access and utilization of electronic resources. Hence, Johnson and Tahan (2002)[138] suggested that the center should provide all lecturers the access to relevant electronic network; the internet is a special form of computer network that connects million of computer globally, and thus being described as a global information infrastructure, global information

system, information superhighway, network of network, international network and cyberspace (Biehi & Calishain, 2002)[119].

Thus, the Internet is commonly referred to as global information resources that contain all sources of information across every academic discipline. The World Wide Web (WWW) has been mainly, robust element on the internet that assists lecturers to penetrate easily through different electronic resources. The Web and other internet facilities that promote accessibility and utilization of electronic resource are e-mail, telnet, FTP, Usenet (news group); and Web 2.0 referred to as social networking tools (Nwagwu, Adekanbi & Bello, 2009)[129]. Grace, Kenny and Qiang (2004)[123] submitted that the academic staff needs to be technologically competent to bridge the gaps of inaccessibility and non utilization of ICT resources in ODL.

One of the key platforms that can enhance the university lecturer's accessibility and utilization of ICT resources in ODL center is digital library. Okebukola (2002)[130] submitted that a digital library is one of the major access points for e-resources in ODL. Okebukola (2002)[130] described digital library as a collection of library resources in electronic form which can be accessed and used with great ease with the aid of computer technology. Magara (2002)[126] defined a digital library as a medium of accessing information without restriction of physical location by the lecturers.

Gbaje (2007)[122] viewed digital library as a collection of internet resources and digitized materials by the university library which can be accessed through the internet or other digital networks by lecturers in the universities. Magara (2002)[126] viewed that the availability of digital library will enhance and facilitate the accessibility of e-resources. Lawal and Ani (2008)[126] opined that digital library is a library that facilitates access to library resource and electronic resources in a cyberspace. Ajala (2002)[116], Grace, Kenny and Qiang (2004)[123] submitted that another notable

virtual library that provide access to electronic resources to lecturers in Africa is the African Virtual University (AVU) online library. The African Virtual University through internet connectivity has provided access to lecturers in 22 countries in Africa to use virtual library with enormous academic teaching and research resources.

Information literacy is generally defined as the ability to identify an information need, locate and access the required information, evaluate, organize and apply it to address the need in question (Kinengyere, 2007)[125]. Ani and Ottong (2010)[118], Ngulube (2010)[129]asserted that the basic element of information literacy that lecturers in ODL need to obtain in order for them to be competent to access and utilize ICTs tools efficiently include; computer literacy, internet literacy and network literacy. Ani and Ottong (2010)[118] opined that computer literacy and internet literacy is information technology literacy. Information Technology (IT) literacy refers to the ability of lecturers to access and use of ICT tools on computer and internet in teaching and research. Ngulube (2010)[142] asserted that network literacy refers to the ability of the lecturer to identify, access and use of electronic information resources for information network.

Access demonstrates the extent at which a particular user is able to simply locate particular resources for use as well as the degree of accessibility of such resources. Access is a factor that can influence the use of ICT resources in ODL. The ease of location would determine whether a lecturer would use ICT resources for teaching or not. It is expected that if lecturers find it easy locating ICT facilities, the tendency to use such resources is high (Kiptalam & Rodrigues, 2011)[125.] ODL has helped to develop the idea of accessibility in education which spread out to include the following; access to cost and affordability, access to course design, access to instruction, research and extension and access to the use of of new digital technologies for course materials.

Accessibility refers to openness, convenience, ease of locating and nearness to information resources. Access to information is important because except an information resource is made accessible to users, it cannot be used (Atinmo, 2000)[118]. Newton (2003)[128] opined that unavailability and inaccessibility of ICT facilities affect the use of ICT in distance education. This mean that lecturers inability to access ICT facilities consequently translate to lecturers not using these facilities for collaboration, research, teaching and learning. Pickersgil (2003)[131] found out that the ease of access to and utilization of ICT allows lecturers to become expert in searching for information. He claimed that ease of accessibility increase the awareness of the world around him.

Ololube (2006)[130] asserted that lack of access to much needed ICT facilities is the result of insufficient funds. Kiptalam and Rodrigues (2011)[125] observed that access to ICT facilities in ODL is a major challenge facing most African countries with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries.

Access to information is crucial to successful instructional delivery and research in the universities. Moon, Hossain, Kang and Shin (2012)[127] opined that access to relevant information is necessary for the lecturers to take efficient decision in his/her research. Aina (2012)[116] asserted that access to information is very crucial in instructional delivery in Nigeria Universities. Aina (2012)[116] affirmed that lecturers in ODL had little access to relevant and reliable information when making decision in their work. Seth and Parida (2006)[132] cautioned that availability of information resources and services does not automatically translate to information accessibility and use. Jimba and Atinmo (2000)[124] maintain that accessibility is about being able to use what is available when it is required.

Accessibility of information materials is one of the basics of information utilization. Atinmo (2000)[118] opined that the more accessible information sources are, the more likely they are to be used and readers tend to use information sources that require the least effort to access. Apparently, accessibility limitation that could be experienced in the use of ICT include: inadequate provision of ICT infrastructures, Internet connection problem, and online database subscription problem, with the availability of electronic information resources, research is no longer difficult. This is due to the fact that most of the documents to be consulted for research are available in electronic formats like the Internet, online database, OPACs, electronic journals, electronic books (Jimba, 2000)[124].

Jimba (2000)[124] upholds that accessibility is about being able to use what is available when it is required and that accessibility is much more than availability. Accessibility of information materials is one of the requisites for information utilization. Facility may be available and even identified as relevant to one's subject of interest, but the user may not be able to lay hands on them because of accessibility problems.

Availability and Accessibility of ICT resources in the university environment have extremely reduced the inconsistency to lecturers in the university around the world. Adeyeye and Iweha (2005)[116] submitted that ICTs potentiality offer diverse benefits for Nigeria universities with respect to teaching, research and publication therefore support access to knowledge and information. Ojo (2006)[130] opined that availability and accessibility of ICTs enhances Nigeria universities to be part of the information society. The inequality of access and use of ICT leads to inconsistency in accessibility and utilization of ICT resources between countries, universities, faculties, department and individual lecturer (Adeogun, 2003)[116]

One of the basic goals of ODL in Nigeria is the provision of enabling environment for teaching and research. This can be done through the availability, accessibility and utilization of ICT tools which is key to successful instructional delivery (Moon, Hossain, Kang & Shin, 2012)[127]. However, the low level of teaching and research in our university environment was due to poor state of ICT resources. This is why Nigeria universities are reportedly lagging behind their counterparts in academic research output, as they are not information friendly. The truth is that most of the documents to be explored for research are available in electronic formats like the Internet, online database, OPACs, electronic journals, electronic books. Some scholars have described ICT tools as the life-engine of organization (Opara, 2003,[144] Moahi, 2009)[130]. Thus, it is advocated that Nigeria universities should be encouraged by stakeholders to appreciate the need of modern digital technology to support teaching and learning.

It is obvious that, in spite of the ICT resources explosion across the world and its impact in teaching and research in the ODL environment, the poor and declining state of ICT infrastructures continues to prevail in some ODL centers. Thus hinder the availability and accessibility of tangible information for teaching and learning in the university. For instance, Missen (2010)[127] reported that Nigeria universities are years, perhaps decades, away from reliable and robust internet connectivity. Sharon (2012)[132] reported that despite the explosion and benefits of ODL in Nigeria, the quality of delivery and infrastructures have been major concern to stakeholders. Aginam (2000)[116] asserted that most ODLs have little or no ICT facilities like cyber café, computer equipped classrooms or high speed internet, in most cases do not even have fund to implement such. Therefore for Nigeria to make a meaningful and sustainable impact on global teaching and research in ODL, the availability and accessibility of ICT resources must be given adequate priority and attention.

Development, formulation and implementation of appropriate ICT polices and strategies in ODL are necessary for effective accessibility and utilization of ICT resources by lecturers in universities. ICT polices are policy frameworks that attempt to understand and address the problem of digital divide and other factors that affect accessibilities and utilization of ICT resources in universities; and thus, promote access and use of ICT resources by lecturers for teaching and research purposes. (Watts & Ibegbulam, 2005)[134]. At ODL, ICT policy will spell out guidelines for the provision of ICT infrastructural facilities and how to make them accessible to academic staff in their offices and laboratories. ICT policy will ensure not only equitable distribution of computers to academic staff in their offices and laboratories, but with the needed Internet access with appropriate bandwidth.

Scholars have hypothesized that there is variation in accessibility and utilization of ICTs and electronic resources by gender. Alao and Folorunso (2008)[117] submitted that there is gender difference in internet use. Akporido (2015)[117] asserted that more females used internet than males in Delta State. Chai and Tsai (2005)[119] reported that males exhibited more favorable attitudes toward Web-based learning than females. Gamage and Halpin (2007)[122] in a survey of the use of ICTs found that most of the ICT users are the youth and adults who are below the age of 35 years and the most active group of ICT users are aged 12-25years.

A study by Alao and Folorunsho (2008)[117] showed that the internet cybercafé in Ilorin were used mostly by people within the age of 21-30 years. Park (2010)[131] asserted that the younger people learn about technology easily and found that younger people use the social network site (SNS) more than the older ones. The study of the use of ICT and e-resources or inequality in use of ICT resources across academic discipline has been disclosed. Historically, the use of computers and later on the internet was usually associated with the scientists. But with tremendous improvement in the technicalities in access and use of information technology, ICT

facilities and e-resources are now accessed and used to access all discipline/fields of specialization.

ODL in Nigeria is being faced with numerous challenges. Yusuf (2006)[135] opined that open and distance education in Nigeria cannot be guaranteed without the use of effective ICT tools (e-mail, fax, internet, television, radio). But these tools are unavailable and inaccessible, several cities and rural areas in Nigeria are yet to have or having fluctuation in the supply of electricity. Additionally, most Nigerian does not have access to telephone and other telecommunication facilities. Even, telephone lines in the urban centres are not sufficient to serve the teeming population. Similarly, according to Igwe (2005), Nwagwu and Ananike (2006)[123] effort to improve ICT's availability and accessibility in Nigeria universities have been hampered by a number of factors; potential ICT users that have the proficiency, skill, and equipment to benefit from access to electronic information are small in number; this implies that there are very few lecturers in the field who are ICT inclined.

The shortage and high cost of equipments, software and hardware compared to situations in industrialized nations. Unavailability and inaccessibility of physical telecommunications infrastructures; telecommunication monopoly, associated with excessively preventive regulations and high costs, and lack of interregional networking and cooperation among national universities and international institution. Commonwealth of Learning (COL) International (2001)[120] submitted that essential services and infrastructures like electricity, telecommunications and postal services must be developed to levels that could support the declared scale of open and distance learning in Nigeria.

Another most serious challenges facing distance education at this level in Nigeria is the need for the integration of new ICT literacy knowledge to academic courses and programmes. Nigerians' lecturers were not able to benefit from international assistance, international networking and cooperation or from courses, conferences and assistance and interaction have

had adverse consequences, both on the attitude of faculty and on the development of the infrastructure necessary for professional development (COL International, 2001)[120]. These myriad of problems in ODL institutions in Nigeria propel the researcher to propose the study, Information and Communication Technology Utilization for open and distance learning in universities in South-west, Nigeria.

Statement of the Problem

Despite the number of ODL in Nigeria today, the need for standard ODL is apparent. Observations of activities in some ODL centers tend to indicate deficiency in the deployment and utilization of ICT facilities by lecturers and students. It is therefore inexcusable to find a typical ODL institution in Nigeria today lacking e-learning platforms, still using the correspondence approach and habitually requesting students to travel long distance to converge on the host institutions during long holidays or weekends for the delivery of traditional face-to-face lectures. Best ODL practices worldwide are determined by how extensively they are ICT driven. The immediate driver of ODL in any nation is the application of ICT as resources for teaching, learning and transmission of information.

However, ODL in Nigeria is still faced with a number of problems, which have continued to hamper its implementation. This has been attributed to inadequate integration of modern ICT infrastructures, leading to low level of accessibility and utilization of ICT facilities by university lecturers. Jegede (2000)[124] revealed that lack of availability and poor distribution of course materials are confronting problem. There are delays and difficulties in developing and distributing materials to study centres. Sharon (2012)[132] opined that despite the proliferation and benefit of ODL in Nigeria, the quality of delivery and infrastructure have been major concern to stakeholders.

The university system has been unable to contain the ever-growing number of qualified candidates seeking higher education in the country (British Council, 2011)[119]. This demand has risen to such high levels that the distance education institutions have been seriously overstretched with high rate of student's dropout (Akpotu & Akpochafo, 2009)[117]. The ever-growing number of students over the years, hinders government intention to provide facilities and necessary infrastructures for the promotion of ICT at all levels of education due to lack of adequate funding, favorable policies implementation to tackle problems of lack of electricity, insufficient computers, and bandwidth which have adverse effect on the use of ICT by both lecturers and distance learners remained unaddressed. There is therefore need to empirically ascertain the state of ODL in Nigeria; vis-à-vis availability, accessibility, and utilization of ICT facilities, hindrances to ICT utilization as well as ICT policies and strategies put in place toward ICT use in ODL in South-west, Nigeria.

Purpose of the Study

The main purpose of this study was to investigate the Information and Communication Technology Utilization for Open and Distance Learning in South-west, Nigeria. Specifically, this study:

1. investigated the availability of ICT facilities for ODL;
2. determine the lecturers access to ICT facilities for ODL;
3. examine the extent of lecturers' utilization of ICT facilities for teaching and research;
4. identify different institutional ICT policies and strategies for ODL;
5. identified factors that facilitate lecturers' ICT utilization;
6. examined the influence of ICT accessibility on instructional delivery and research;

7. examined the influence of the demographic variables (age, gender, discipline and academic qualification) on the utilization of ICT facilities;
8. identified factors hindering the effective utilization of ICT facilities in ODL

Research Questions

The following research questions were answered in the study:

1. What ICT facilities are available in ODL?
2. What ICT facilities are accessible to lecturers in ODL?
3. What is the extent of lecturers' utilization of ICT facilities in ODL?
4. What are the institutional ICT policies and strategies geared towards effective utilization of ICT facilities?
5. What are the major factors that facilitate ICT utilization in ODL?
6. What is the influence of ICT accessibility on instructional delivery and research in ODL?
7. What is the influence of the demographic variables (age, gender, discipline and academic qualification) on ICT facilities utilization?
8. What are the factors hindering the effective utilization of ICT facilities in ODL?

Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

H_{O1}: There is no significant difference in the availability of ICT facilities based on university type

H_{O2}: There is no significant difference in the lecturers' access to ICT facilities based on university type.

H_{O3}: There is no significant difference in the extent of lecturers' utilization of ICT facilities based on university type.

H_{O4}: There is no significant difference in the ICT policies and strategies framework based on university type.

Scope of the Study

This study focused on the ICT utilization for ODL in universities in South-west, Nigeria. This study adopted quantitative research design. Specifically, descriptive research of survey type to source, process and analyze the information collected through the use of researcher designed-questionnaire. The study targeted all ODLs in South-west, Nigeria consisting of conventional dual mode and non-conventional single mode ODLs, which were purposively sampled.

Accredited universities that run ODL programme in South-west, Nigeria were the:

i. CDL University of Ibadan;
ii. DLI University of Lagos;
iii. CDL Obafemi Awolowo University, Ife;
iv. National Open University of Nigeria (NOUN);
v. ODL Center, (LAUTECH) Ogbomoso

The researcher selected respondents from CDLs Obafemi Awolowo University, Ile-Ife, University of Ibadan, DLI University of Lagos, NOUN and ODL centre, LAUTECH. The respondents were purposively sampled for the study. The Dependent Variables for the study were lecturers' teaching and research. Independent Variables; Measured Variables: Availability, Accessibility, Utilization, ICT Policies and Strategies. Control/ Moderated/ Demographic Variables: Age, Gender, Discipline and Academic Qualification.

Clarification of Major Terms and Variables

The major terms and variables used in the study were clarified as follows:

Open and Distance learning: learning that takes place when the instructor and learner are not in the same physical location, making use of instructional materials.

Open University: educational institution offers structural learning in which the instructor/ facilitator and students are separated by time and space, making use of ICT resources.

Lecturers: academic staff, an employee of the university with a duty to teach and conduct research.

Teaching: conveying information or skill to a student through ICT tools by lecturers

Research: utilization of ICT resources to discover new facts in ODL.

Availability: availability of ICT resources that can be accessed by academic staff for teaching and research in ODL centers

Accessibility: is a process by which academic staff can easily locate ICT resources for instructional delivery and research in ODL centers.

Utilization: ability to use ICT resources for teaching and research in ODL centers

ICT Facilities: are tools used to access electronic information resources for teaching and research in ODL centers.

Significance of the Study

The present study would be significant to; academic staff, students, university administration, government and NUC.

The availability and accessibility of ICT facilities will greatly enhance the effectiveness and efficiency of academic staff in their teaching and research. Access to relevant information will enhance their research output and instructional delivery to the students. Availability of ICT facilities in ODL will enhance communication between lecturers and students. It is the basis for distributing information and facilitating communication between lecturers and students as in video-conferencing, audio-conferencing and e-mail.

Student benefits through the availability of ICT resources in that; they will be able to acquire skills that needed for their studies. It will present an efficient learning environment for students which increase their academic performance and quality of their work. ICT allows students to collaborate and exchange information on a wide scale. The increase use of ICT to deliver and enhance ODL is now an emerging practice for all learners living in rural and geographically remote area, thus having advantage in overcoming geographical barriers for example video-conferencing facilities are developed to enable isolated learners to share learning with others in remote areas.

University administration will be benefited through the study, as the study will create awareness for them on the state of ICT facilities and how to harness it. Availability of ICT facilities will enhance the administration to provide various support services at different phases of students learning life cycles such as admission phase, learning phase, evaluation and certification phase. University administration will be able to provide learners support services at all levels of their studies. It will avail the administration the opportunity to develop ICT policies and strategies towards effective sustainability of ICT resources in ODL as well as promoting access and the utilization of relevant ICT facilities for lecturers in ODL institutions. University administration will provide enough ICT facilities for lecturers to enhance their instructional delivery and research activities.

The study will avail the government the opportunity to increase funding for ODL in the country to procure relevant ICT facilities for the reason that ODL in Nigeria cannot be guaranteed without integrating relevant ICT facilities, and for the fact that ODL is anchored on ICT facilities.

The supervisory body to all degree awarding institution in Nigeria, the NUC will recommend through this study to provide fund for ODL to procure relevant ICT facilities and other logistics because ICT facilities are major determinant of the viability of ODL programme in a country. To ensure acceptable world ODL academic standard and best practices, the availability of ICT facilities will be given adequate attention. It will avail the NUC the opportunity to accredit more programmes and courses for ODL, when the ICT facilities are on ground.

CHAPTER TWO

REVIEW OF THE RELATED LITERATURE

The related literature to this study is reviewed under the following subheadings:

i. History of Open and Distance Learning in Nigeria

ii. Availability of Information and Communication Technology Facilities in Open and Distance Learning in Nigeria

iii. Accessibility and Utilization of Information and Communication Technology Facilities in Open and Distance Learning

iv. Information and Communication Technology Policy and Strategy in Open and Distance Learning

v. Factors that Facilitate Lecturers' Information and Communication Technology Utilization

vi. Influence of Accessibility of Information and Communication Technology on Instructional Delivery and Research

vii. Influence of Information and Communication Technology on Education

viii. Influence of Lecturers' Demographic variables characteristics on the Utilization of Information and Communication Technology Facilities

ix. Theoretical Framework for the Study

x. The Conceptual Model for the Study

xi. Appraisal of the Reviewed Literature

History of Open and Distance Learning in Nigeria

Nwachukwu and Ubogu (2015)[129] opined that ODL has been referred as a method of teaching and learning expressed by disconnection of teacher and learner in terms of time and place; uses numerous media for delivery of instruction; entailed collaborative communication and intermittent face-to-face meeting for tutorials and learner-learner interaction. Rahman (2014)[131] emphasized that Distance education has its origin in the form of correspondence education around 1800s. Correspondence education was based on the print medium, postal system, and an orientation to information transfer for the purpose of preparing students for public exams.

Singh (2013)[133] In the process of systematic development of Distance learning, correspondence education was referred as the first generation model of distance learning and multimedia distance education as the second generation model. In these models there was a little or no student-teacher or student-student interaction observed. Third generation of distance education is called an interactive, multimedia model of distance education, in this model there was an emphasis on communication and learning through the use of interactive media such as computer mediated communications, audio graphics or video conferencing. This third generation of distance education is based on the use of information technologies.

The need for distance learning in Nigeria was studied by Duffy, Gilbert, Kenny and kwong (2002)[121] did comparative study of the academic achievement of distance learning students and classroom-based students undertaken the same module in a degree course. The finding shows that though all the sampled students were victorious in their studies, the distance learning students' performance was significantly higher than the performance of their classroom-based contemporaries. This findings which appeared strange, recommend the potential of ODL.

The provision of quality education has been one of the challenges facing developing countries such as Nigeria. Research has shown that conventional education is extremely complex to meet the demand of today's socio educational setting especially for developing countries like Nigeria (Peat & Helland, 2002)[131].

The limitation of spaces in the universities imposes restriction on access. Statistics from the Joint Admissions and Matriculation (JAMB) have exposed that they cannot have their way.

Table 1:
Demand and Supply of University Education in Nigeria 1998/1999-2016/2017

Year	No. of Universities	Application	Admission	%Admitted	Total Unplaced
1998/1999	39	537,226	64,176	12%	473,050
2002/2003	53	994,381	51,843	5%	942,335
2003/2004	54	1,046,950	105,157	10%	941,793
2004/2005	56	841,878	122,492	15%	719,386
2005/2006	75	916,371	76,984	9%	839,387
2006/2007	76	806,089	123,626	15%	679,846
2007/2008	94	911,653	107,370	11%	804,283
2008/2009	95	1,054,060	200,000	18%	854,060
2009/2010	110	1,513,940	423,531	28%	1,090,409
2010/2011	112	1,636,356	417,341	26%	1,219,015
2011/2012	117	1,632,835	447,176	27%	1,185,659
2012/2013	118	1,924,393	463,395	24%	1,460,998
2013/2014	118	1,785,608	437,704	25%	1,347,904
2014/2015	140	1,612,247	485,338	30%	1,126,909
2015/2016	152	1,598,330	430,000	27%	1,168,330
2016/2017	152	1,736,571	434,959	25%	1,301,612

Source: JAMB Report of 1998/1999-2016/2017

On the average, less than 12% of those who apply for admission are able to secure placement. Responding to the state of affairs, the NUC and the Committee of Vice Chancellors of Nigeria Universities (2012)[128] have alerted the nation of the need to create space for potential students. This is due to the fact that out of the 1,632,835 candidates who qualified for university admission for 2011/2012 session, only 447,176 were admitted in the existing universities because of the carrying capacities of each of the universities.

Similarly, while expressing worries about the inability of qualified candidates to get a space in the conventional universities, Okebukola (2007)[130] put forward the following suggestions:

i. re-introduction of the Higher School Certificate;
ii. qualified Polytechnics and Colleges of education should be given degree-awarding status;
iii. the NOUN should be strengthened to take in more potential undergraduates. Thus the National Open University bill was approved on 20th April, 1993 to offer access to higher education of those facing physical challenges, financial constraint, and geographical remoteness, for the less privileged (Akande & Sofowora, 2011)[117].

NOUN is currently the only single mode university endorsed for ODL in the delivery of university education. Akande and Sofowora (2011)[117] reported that the NOUN which started with teacher training programmes among others has, since its setting up, been employing integrated media and multi-media technologies in teaching. Akande and Sofowora (2011)[117] further stated that NOUN is the first fully fledged university that runs an extremely open and distance teaching and learning system, and delivers its course material via print in conjunction with ICT formats like CD-ROMs and on the basis of self learning. NOUN currently has 50 study centers, which are dispersed into six geopolitical zones of the nation. Students' enrolment capacity is projected at about 50,000 students.

The history of ODL system can be outlined to the pre-independence era (i.e. Pre- 1960) when some universities and Colleges (mostly from United Kingdom) established study centres and even conducted examinations in a few of the Nigeria cities like Lagos and Ibadan. In fact, the premier university in Nigeria, University of Ibadan was a former extension of University College, London, until 1948, when it became autonomous. Oxford University, in 1947,

established extra-moral studies at the then University College in Nigeria. In 1960, the first distance education course by radio was inaugurated by the National Broadcasting Cooperation (NBC). The then National Television of Nigeria (NTV) directed Educational Televisions Programmes (ETP) in all stations.

In 1972, the Ahmadu Bello University (ABU) commenced her University of Air (UA). In 1975, it established Teacher in Service Education Programme (TISED). Also, in 1976, the Federal Government of Nigeria established the National Teachers' Institute (NTI). In 1987, the University of Lagos established the Correspondence and Open Studies Unit (COSU). University of Abuja established the Centre of Distance learning (CDL) and in the year 2001, the Federal government of Nigeria established the National Open University of Nigeria (NOUN) to run some courses. In March, 2002, National Open University invited experts from universities, polytechnics, colleges and industries for a one-month structural design and course materials development in Lokoja, Nigeria. Today NOUN admits over thirty thousand students annually (Adekanbi, 1993)[116].

There are several ways to defining the term ODL. Adebayo (2007)[116] defines ODL as the form of education that takes place outside the conventional school system; it is communicated without inexorably having personal interaction with students or learners. Creed (2001)[120] defined Distance Learning as an educational procedure in which a major quantity of the teaching is carried out by someone far disconnected in space and or time from the learners. UNESCO (2002)[134]stated that ODL is one of the most rapid growing fields of education, and it's potential impact on all delivery systems has been greatly heightened through the development of internet-based information technologies, and in particular the World Wide Web presenting approaches that focus on opening access to education and training provision, liberating learners from the

restraints of time and place, presenting flexible learning opportunities to individuals and groups of learners.

The Federal Ministry of Education (FME) (2002)[122] describes ODL as any group of learning in which the provider assists individual learners to work out choices over any one or more of a number of features of learning and distance learning as an educational process in which a significant quantity of the teaching is carried out by someone removed in space and/or time from the learners. Dodds (2005)[121] argued that open learning is an approach which joined the ideas of learner centeredness, lifelong learning, flexibility of learner provision, the removal of obstacle to access learning. Distance Education aims at increasing access to education for those who have difficulty in accessing it within the mainstream such as the poor, illiterate, woman, marginalized and those living in remote area (Dhanarajan, 2008)[120].

Generally, ODL educational courses are made up of numbers of course module of learning materials which include any of the following; teaching texts, study guides, course guide, readers or compilation, assignments (with or without an accompanying tutor guide), television broadcast or videotapes, radio broadcasts or audiotapes, software or online information and data, CD-ROMs, textbooks and laboratory materials (Glen, 2005)[122]. ODL was introduced to the university education system in Nigeria in 1983; it only became functional in 2001. The programme provides access to young, elderly and disadvantaged groups who are interested in the realization of university education, anytime and anywhere. Open and distance education is flexibly and learner friendly.

The NOUN started with extraordinary admission of 34,000 students which no single conventional university in Nigeria having the ability to absorb such. Since the figure has been on the increase, as at July 2013, the NOUN has registered students. NOUN has fifty-two study

centres across Nigeria, fully run on ICT resources with the aim to open more. The University has further increased the access by producing more study centres in Military Barracks, Nigeria Prison Yards, and Immigration office, Nigeria Security and Civil Defense and most recently National Union Road Transport Workers. (Akande & Sofowora, 2011)[117].

Apart from Nigeria, many countries operate ODL in the world. Table 2 shows best universities for distance education in the world

Table 2:

Best Universities for Distance Education

S/N	Universities	Courses Offered for Distance Learning	Ranking
1.	University of Liverpool	Nursing, Business, Medical, Information technology, Law, health, psychology	5th
2.	University of Manchester (Britain) Distance Learning	Human Resources, Arts, Informatics, Nursing, Management, Engineering	3rd
3.	Indira Gandhi National Open University India	Law, Arts, Science	1st
4.	Boston University Distance Education	Arts, Education, Criminal Justice, Music Education, Computer	4th
5.	Symbiosis Center for Distance Learning, India	Health care, Law, Management, Commerce, Science and Arts	2nd
6.	University of Florida Distance Learning	Agricultural & Life science, journalism, Science and Arts, health, communication	6th
7.	Massey University Distance Learning, New Zealand	Business, Creative Arts, Humanities, Social Science	7th
8.	University of Southern Queens Land Australia	Commerce, Sports, Arts, Social Science, Engineering	10th
9.	Charles Sturt University Distance Learning	Agricultural science, Allied Health, Communication, Engineering, Business studies	9th
10	University of Pretoria, Unit of Distance Education	B.Ed. (Honors) in policy and Educational management	8th

Source: Best College Scholarship and Financial Aid for International Students (2016)

Importance of Open and Distance Learning

ODL has become a very vital form of learning. This is due to the fact that challenges such as distance and time, which are barriers to conventional learning, are overcome in open and distance learning. COL (2001)[120] opined that ODL is significant in the following ways; overcoming physical distance, solving time or scheduling problems, increasing the limited number of places available, defying low or separated enrolment, making best use of the inadequate number of teacher available, dealing with intellectual, religious and political manifestation. Nwaocha and Iyiama (2008)[129] clarify the relevance and challenges of ODL as follows: increase people access to education; social development and economic development.

The challenges of ODL are; poor funding, power supply, lack of skills by lecturers in designing course wares, poverty and poor ICT access, internet connectivity, Low teledensity and technophobia among others. Ololube (2006)[130], Ifinedo and Ololube (2007)[123] specify the challenges of ODL in Nigeria, such as; lack of electricity to power ICTs materials, poor telecommunication facilities, and poor postal system. Above all, lack of access to the needed infrastructures due to inadequate funds. Ololube et al. (2007)[120] identified challenges of ODL such as: poor economic situation insufficient funding, poverty, low literacy rate, problem with electricity, poor ICT facilities, poor postal services, poor internet access, organizational problems, social and cultural problems

Availability of Information and Communication Technology Facilities in Open and Distance Learning in Nigeria

The FRN (2004)[122] documented the importance of ICT as a tool and resource for improving knowledge. ICT has gained reliability as a means for effective study of other subject. Ololube (2006)[120] opined that a larger percentage of educational objective are attained when there is successful utilization of ICT facilities than when contrary become the case.

Moore and Kearsely (2005)[128] defined ICT as an modern approach for delivering computer mediated, well-designed, learner-centered and interactive learning environments to anyone, anyplace, anytime by utilizing the internet technologies concerned with instructional design philosophy. ICT tools encompass of electronic device which are utilized for information, by lecturers and students. Moore and Kearsely (2005)[128] stated that electronic devices include computer (hardware and software) networking devices, telephone, video, multimedia and internet-application and utilization of these devices converted information, text-messages, sound and motion to common electronic forms.

The purposes of using ICT, in distance learning include; access to record and information about school activities fast and timely. It also gives room for unlimited access to lecturer and students in issuing relevant information such as access to course materials and class forum participation development in various fields of study. Bialobrezeska and Cohen (2003)[119] define the information support system in ODL as technologies that generally support an individual's capacity to administer and communicate information electronically; it includes software and systems needed for communication such as internet and e-mail. The information support system according to Perrin (2006)[131] as a device encompasses of human and non human resources to guide and alleviate educational social transaction through academic network refer to social messengers which run in the platform of World Wide Web (WWW). The social messengers is harmonized by e-mail, instant messaging, internet phones, video-conferencing, net meeting, and weblogs (blogs).

Ayo, et al. (2011)[118] presented the desirability of social networking combined with e-Learning. The system presents collaborative e-Learning which assists to develop the value of education beyond the capacities of the individual institutions. It shows vividly, quality education

without limits, as there is better interaction and collaboration between students, faculty within and outside the country based on the areas of proficiency of individual faculty and institutions. The anticipated model offers a workable model for delivery of quality education based on ICT facilities (Internet, PCs, PDAs, iPods, mobile phones etc). Where the Internet is a challenge, the mobile devices, which are highly available, will offer a cheaper alternative to all and sundry.

Johnson (2005)[124] enumerated ICT tools for ODL; Computer is an electronic device that is capable of receiving, storing, manipulating and retrieving data speedily and efficiently. The availability of the hardware and software help the learner to decide institutional materials that meet his/her needs. The computer is an educational technology medium for individualizing instruction. It therefore, delivers admirable service in ODL both as a instructor and as a tool. (Asogwa, 2007).[118]

The radio is a device that facilitates human voice to be broadcasted by electromagnetic waves over a long distance without the help of a wire (Matthew, 2007)[127]. ODL programmes can be broadcasted through the use of radio and this helps to create access. Open and distance institutions use radio to disseminate information, counseling and to facilitate their courses at specific hours. Since radio broadcast can be received even in very remote areas, then it becomes an important tool in ODL.

ODL makes use of television as an important medium to disseminate information to learners. Television broadcast can be in the form of live broadcast where educational events are directly telecast or recorded broadcast where pre-recorded programmes are broadcast per transmission scheduled for the suitability of the producer and the students. The use of the teleconferencing facilities allow many people to be concurrently linked so that discussion can

take place even though the participants do not meet. It is particularly useful when the teacher and the students are widely detached and separated because of geographical location.

Networking is a communication system that links together computers, storage devices, word processors, printers, the telephone system and other electronic devices. ICT networks help the exchange of information between people and institutions. ICT-based networking that can be employed in ODL is internet/world wide web. (Lucey, 2005)[126] Interactive Video involves the use of video tapes or video discs designed in such a way that they respond to choices made by the individual users. It is a very effective tool for transmission information (Asogwa, 2007)[118].

Kruper, Volman and Travels (2005)[126] opined that information support system in ODL includes of search engine which improves lecturers and students easy information retrieval. Brown (2003)[119] asserted that Information Support System (ISS) has an extensive collection of activities and equipments including all the tools, application and information, which are available and accessible through computers. The influence of ISS through web medium of communication has contributed to the growth of social presence among the distance learning group. (Kehwald, 2008)[125].

Murali (2009)[128] itemized the infrastructural facilities in ODL: network infrastructure, computing infrastructure, system and application software, internet service provider, bandwidth, policy framework and the security infrastructures. Anderson (2007)[117] opined that infrastructural facility is fundamental in accomplishing the goals of enabling, sustainable and affordable access to ICT. This, Anderson (2007)[117] further stated that the availability and use of infrastructural facilities are hindered by poor power supply, lack of network and high cost of ICT facilities.

Akpotu and Akpochafo (2009)[117] stated that inability of the government to adopt UNESCO recommendation that 26% of the national budget be earmarked to education sector

impedes the development of education and there has been little corresponding improvement of institutional facilities and infrastructures. Rao (2009)[131] highlighted the availability of ICT facilities in ODL such as network infrastructure, computing infrastructure, stable system and application internet service provider (ISP) and internet bandwidth and security infrastructure. These facilities are not on ground in ODL due to epileptic power supply and lack of adequate funding.

In addition, the failure of government to increase funding to the university system has been largely owing to financial restraints occurred from the slow development of the nation's economy (Richardson, 2009)[132]. Sharon (2012)[132] opined that the advent of the internet has restructured educational delivery in Nigeria. Several schools and colleges today have started offering online courses, but despite the increase and benefit of ODL in Nigeria, the quality of delivery and ICT infrastructure had been major concern to stakeholders.

Obioha and Ndidi (2011)[129] examined the administrative problems of open and distance education in Nigeria. In the search to find out if there is a significant difference in the administrative challenges of NOUN in two broad geopolitical zones (Northern and Southern zone of Nigeria), they found that the most serious problem was the administration of study centre by staff. Jegede (2009)[124] explained that lack of availability and poor distribution of course materials at NOUN is a confronting problem. Akande and Sofowora (2011)[117] reported that Obafemi Awolowo University has integrated ICTs into distance learning and into every aspect of academics and administration using the new ICT strategic plan for resolving the challenges of quality education through distance learning programme.

Akande and Sofowora (2011)[117] further stated that the flexibility and accessibility enabled by ICT led to the emergence of ODL in Obafemi Awolowo University (Ile-Ife) through

virtual learning electronic medium and integrated modes techniques for which the university was known and acclaimed as the foremost ICT University in Nigeria. Ekpunobi (2014)[122] reported that NTI operates the study centres system furnished with some ICT facilities, like computer, multimedia player LCD projectors, televisions and printers, and does its registration and distributes courses material online. Through the ODL facilitated by ICT, the NTI has graduated more than 300,000 candidates.

Akande and Sofowora (2011)[117] reported that the highest factor affecting ICT usage among distance learners who enrolled for the Bachelor of Education Programme at the Obafemi Awolowo University Ile-Ife are poor ICT infrastructures on the rural areas and epileptic power supply which have negatively affected the development and integration of ICT in ODL. Adebayo (2007)[129] reported that a major challenge to ODL programme delivery is low teledensity. It was observed that access to unhindered use of ICT tools, such as telephones and the internet, has been very low. Jimoh (2013)[124] concurred that the use of ICT resources in ODL is still very low. Adegbite and Oyekanmi (2010)[116] reported that ODL programme in the University of Ibadan, Nigeria, unlike other ODL programme in different parts of the world are faced with various educational, social and psychological problems associated with the distance learning. The facilities offered by the University of Ibadan distance learning centre towards user diverse needs are not sufficient.

Accessibility and Utilization of Information and Communication Technology Facilities in Open and Distance Learning

Access typically refer to school strategies or policies designed to remove institution hindrances or to provide the resources, social services and academic support that lecturers and students may need to thrive in teaching and learning (Organization for Economics Corporation and Development (OECD, 2008)[129]. Important types of access that government may offer for

lecturers and students in ODL, include access to high-speed internet connections, adequate hardware (Computer, laptops, and tablets) and software (particularly learning application) so that both lecturers and students have equitable access to the ICT facilities (FGN, 2004)[122].

Access to information is very vital to successful instructional delivery and research in the universities. Moon, Hossain, Kang and Shin (2012)[127] opined that access to relevant information is required for the lecturers to take professional decision in his/her research. Aina (2012)[116] asserted that access to information is very central in instructional delivery in Nigeria Universities. Aina (2012)[116] affirmed that lecturers in Nigeria universities had little access to relevant and reliable information when making decisions in their work. Accessibility refers to openness, convenience, ease of locating and proximity to information resources. Access to information is important because except an information source is made accessible to users, it cannot be used.

Jimba and Atinmo (2000)[124] maintained that accessibility is about being able to use what is available when it is required. Accessibility of information materials is one of the requisites of information utilization. Atinmo (2000)[118] opined that the more accessible information sources are, the more likely they are to be used and readers tend to use information sources that require the least effort to access. Accessibility limitations that could be experienced in the use of ICT include: inadequate provision of infrastructure, Internet connection problem, and online database subscription problem, with the availability of electronic information resources, research is no longer complicated. There is no gainsaying the fact that most of the documents to be consulted for research are available in electronic formats like the Internet, online database, OPACs, electronic journals, electronic books.

Seth and Parida (2006)[132] affirmed that the availability of resources does not automatically translate to its use but its accessibility. Access to information is important because except an information resource is made accessible to user, it cannot be used. Jimba (2000)[124] maintains that accessibility is about being able to use what is available when it is required and that accessibility is much more than availability. Accessibility of information materials is one of the basics for information utilization. Resources may be available and even acknowledged as germane to one's subject of interest, but the user may not be able to lay hands on them because of accessibility problems.

Ani and Esin (2003)[118] investigated the ICT accessibility in five federal universities in Nigeria, although it was found that lecturers in the survey have effective access to computers, access to networking and the Internet was apparently poor. The paper concluded that access to Information Technology facilities; computers, electronic networks, and the Internet was a recent development in the surveyed universities and recommended adequate provision of computers and the Internet for lecturers to support them in their teaching and research. A study by Ehikhamenor (2003)[121] investigating the ICT facilities in 10 universities in Nigeria revealed that 64.4% and 50.4% of the lecturers in the survey have computers and the internet in their offices respectively, while the prevalence of electronic networks was reportedly poor at these universities.

Emojorho and Adomi (2006)[122] investigated access to ICT in Delta state university, Nigeria. The findings of the study showed that 72.5% of the lecturers reportedly have ICT facilities including Internet access at their offices, 19.6% have computers at home. Low level of access to networking was also reported in the survey. A similar study by Nwokedi (2007)[129] at the University of Jos, Nigeria indicated that 95.52% of the lecturers surveyed in the medical

sciences have computers in their offices, 69.40% have computers at home, and 67.16% have internet access in office.

A recent study by Nwezeh (2010)[129] showed a high state of ICT environment in Obafemi Awolowo University, Nigeria. The findings of the survey indicated that 95.7% of the lecturers have computers in their offices, 56.5% have computers at home, 69.6% have internet access in their offices, and only 8.7% have Internet access at home. But Ani, Edem and Ottong (2010)[118] have reported very low ICT facilities at the University of Calabar, Calabar, Nigeria as only 3.08% of the respondents have Internet access in their offices. However, it can be concluded in the review that there is improving trend in utilizing ICT in Nigerian universities, (although with some fluctuations) which is in tandem with global trend.

Tiamiyu (2000)[133] classified access and use of ICTs and electronic resources into stages: pre-ICT era, very early stages, and advanced stages. The paper indicated that the late 1990s was the period that was characterized with very early stages of ICT usage in Nigeria. During this period, adoption of ICT by relevant organizations (universities) was observably low. Hence early studies on access and use of ICTs and electronic resources in the early 2000s characteristically revealed low level of access and use by lecturers in Nigerian universities (Ani & Esin, 2003)[118].

A study by Ani and Esin (2003)[118] revealed extensive use of computers but negligible use of networking by lecturers in Nigerian universities. It was reported that lack of access to ICT and insufficient skills were major obstacles against use of ICT. Ehikhamenor (2003)[121] surveyed the use and non-use of electronic resources on the Internet by academic scientists in ten universities in Nigeria. The findings of the study revealed that Nigerian scientists were yet to embrace or appreciate the use of Internet and electronic resources in conducting research. It was found that lecturers in the survey made very little use of the Internet resources in their teaching and research

activities, as they were still relying on the printed sources; access to electronic networks was reportedly minimal.

In a related study, Ehikhamenor (2003)[121] similarly reported a low level of access and use of electronic resources by academic scientists at Ten Nigerian Universities for teaching and research purposes. Jagboro (2003)[124]in a study to appraise the level of utilization of the Internet resources by lecturers in Obafemi Awolowo University, Ife, Nigeria, found that Internet resources were used scarcely by the respondents. He however concluded that Internet use in Nigerian universities will improve in future.

Eke (2006)[121] surveyed the extent of awareness and use of ICTs by lecturers in tertiary institutions in Imo State, Nigeria; in which one polytechnic, one college of education, and two universities, were used in the survey. The findings showed that while 50% of the respondents were using the computers and the Internet, it was found that access to ICTs was the major problem against use. Emojorho and Adomi (2006)[122] surveyed the use of information technology facilities by all categories of staff (lecturers, senior non-lecturers and junior non-lecturers) of Delta State University, Nigeria for academic and teaching and research activities. It was found that lecturers were major users of ICTs as 92.2% of them were using computers, 13.7% of the respondents used local area networks (LANs) and a vast majority used the Internet in their academic and teaching and research activities. Ani and Bassey (2003)[118] reported that teaching and research information was the basic information need by lecturers in a survey of three Nigerian universities, and that both the Internet (15.2%) and the university library (15.5%) were comparatively used by the lecturers in satisfying their information needs in teaching and research.

Azubogu and Madu (2007)[119]did a survey that explored the use of ICTs among the teaching staff of Imo State University, Owerri, Nigeria; with the results indicating high usage of ICT facilities. In a survey by Nwokedi (2007)[129] to assess the use of the Internet in teaching and research activities by lecturers in Medical Sciences in the University of Jos, Nigeria, it was revealed that majority of the respondents regularly used the Internet in their teaching and research. Conversely, a survey by Popoola (2008)[131] has shown a low level of access and use of ICT sources by social scientists in 13 Nigerian universities. It was found that, the use of the Internet with a mean score of 1.96 was comparatively low than obtained with printed resources – journals (4.98) and textbooks (3.94) by the respondents. However, another study of the pattern of access of the Internet resources on teaching and research in Obafemi Awolowo University, Nigeria by Nwezeh (2010)[143] revealed high level of accessibility and utilization ICTs particularly the Internet by the lecturers, as 73.9% of them made regular use of the Internet in their teaching activities.

Ani, Edem and Ottong (2010)[118] asserted that in spite of the apparent impact of ICT revolution in teaching and research in developed countries, that access to the Internet is not prevalent in Nigeria universities, In view of this, they conducted a study to investigate the extent of Internet access and use by lecturers in the University of Calabar, Calabar, Nigeria, as teaching and research tool. The findings of the study revealed extensive use of the Internet by the respondents, although official access to the Internet was reportedly low in the university. Most of the respondents reportedly lack access to the Internet in their offices and predominantly use commercial Internet cybercafé off campus to access e-resources for their research.

In a study that aimed to explore the impact of the Internet use on teaching and research by lecturers in Ladoke Akintola University of Technology in Nigeria, Ajala (2010)[116] found that

a vast majority of respondents were using the Internet regularly in teaching and research. According to Egberongbe (2011)[121] the emergence of ICT has enormously affected how information is accessed and used by lecturers in Nigerian universities. In her study, she surveyed the use of electronic resources by lecturers at the University of Lagos, Nigeria. It was found that 90.6% of the respondents accessed and used electronic journals, WWW (53.6%), e-books (28.6%) and online databases (17.86%).

The use of the Internet by undergraduate students in Nigerian universities was the focus of studies by Ani (2010)[118], Ojokoh and Asaolu (2005)[130], Osunade and Ojo (2006)[131]. Highlights of these studies indicated that Internet use is widespread among students in Nigerian universities, but that access is mostly through commercial cybercafé within and outside the universities. The findings of the studies enlarged the need to improve Internet connectivity in Nigerian universities towards a wider access by the academic community especially the lecturers.

Information and Communication Technology Policy and Strategy in Open and Distance Learning

Development, formulation and implementation of appropriate ICT policies and strategies in ODL are essential for successful accessibility and utilization of electronic resources by lecturers in universities. ICT policies in ODL are a number of initiative that attempt to understand and address the problem of digital divide and other factors that affect accessibility and utilization of e-resources, and thus, promote access and use of e-resources by lecturers for research purposes (Watts & Ibegbulam, 2005)[134]. A well articulated ICT policy in ODL is desirable to curb the menace of digital divide, and promote integration and adoption of ICTs as well as access and use of e-resources in ODL to support efficient research process. This is why Ingersoll and Culshaw (2004)[137] opined that ICT policies have helped universities to ensure

effective and equitably distribution of ICT facilities for research and therefore defines the scope of ICT services that are provided by the universities especially in the libraries in terms of electronic information services.

At the ODL, ICT policy will spell out guidelines for the provision of ICT infrastructural facilities and how to make them accessible to lecturers in their offices and laboratories. ICT policy will ensure not only equitable distribution of computers to academic staff in their offices and laboratories, but with the needed Internet access with appropriate bandwidth. ICT policy will deal with issues of the provision and maintenance of computer networks/Intranet in the university campus as well as regular training of lecturers on how to access and use these networks, the Internet or other ICT facilities that are available in the university toward enhanced and efficient research process.

Most significantly, formulation of ICT policy by the university management will help the university to have financial budget for the procurement, maintenance, training, and employment of personnel in ICTs. Hence, ICT policy allows proper allocation of scarce resources for ICT infrastructures in the university including different units/departments/faculties (Jennings, 2002)[138]. Ethical use of ICT is another issue that needs to be included in the formulation of ICT policy in the university. Most importantly, University ICT policy will support the university library's electronic collection development policy (especially in areas of budgetary allocation), ICT infrastructures and personnel in the library, in order to promote and sustain the provision of e-resources to lecturers for research purposes.

However, the review by Watts and Ibegbulam (2005)[134] revealed that only a few Nigeria universities are working towards meeting this goal especially in respect of the university libraries. The study showed that only a few libraries had developed ICT policies and strategies

geared toward the promotion of sustainable access to ICT resources in Nigeria. For example, Watts and Ibegbulam (2006)[134] found that there was no written ICT policy in the Medical Library, College of Medicine, University of Nigeria, or that of the university in general. The report indicated that; although no written strategies or policies have been produced yet, the organization is sensitive to the issue of providing ICTs and Internet access. Departments across the university have been tasked with developing their own strategies, and the intention is that these will inform a university-wide policy on ICT provision (Watts & Ibegbulam, 2005)[134].

Observably, and in view of crucial role of ICT policy to promote access to scientific and technical information for research as highlighted by Watts and Ibegbulam (2005)[134] most Nigeria universities have not embarked on formulation of their national ICT policies. Consequently, and in line with international norms; the Federal Executive of Nigeria (FEN) approved the National Information Technology Policy in March 2001, while the National Information Technology Development Agency (NITDA) was established in April, 2001 to implement the policy (Adeyeye & Iweha, 2005)[116].

Institutional ICT policy in Nigerian universities is linked to national ICT policy. This is why the FME in Nigeria in collaboration with NUC approved the establishment of National Virtual Library Project (NVLP) in 2002 to promote access to electronic information resources in Nigerian universities for teaching and research. According to Borishade (2002)[119], one of the major objectives of the NVLP is to improve the quality of teaching and research in institutions of higher learning in Nigeria through the provision of access to electronic resources.

Factors that facilitate Lecturers' ICT utilization in Open and Distance Learning

Carmona and Marin (2013)[119] stressed that ICT usage today in education system is reforming and supporting the organizational structures of universities to grow them as

knowledge hubs, need of ICT support has been proved very helpful in Distance education in several areas but largely it is classified in the areas of Academic Management and Administrative Functions, In Research Work and in Delivery and Support Services for Learners which is represented by figure 1.

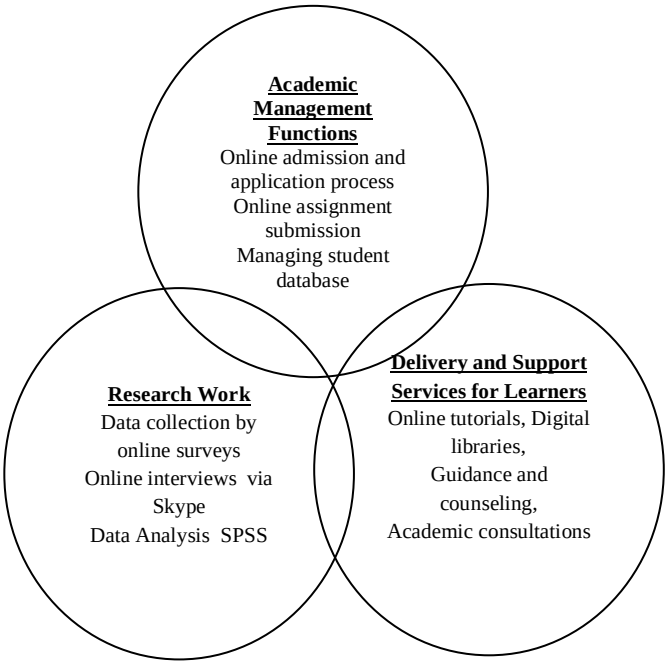

Figure 1: Areas of Distance Education where ICTs are needed

Carmona and Marin (2013)[119] stressed that arrays of audio-visual media and modern system are currently in use for effective dissemination of knowledge among the learners at a distance like Print media, Broadcast media, Audio and video CD/ DVD, mobile phones, educational software and the computer. The other related modern technologies in ODL are telephone tutoring, computer conferencing, teletext and videotext, multimedia and hypermedia Computer Assisted Instructions, e-books, online database, digital libraries, online discussion fora, wikis, MOOCs; talk-back TV, open source software which are applied independently combined with other technologies.

The Open University of Tanzania (TOUT) (2013)[133] stressed that ICT's have been proved very useful in almost every aspect of Distance Educational system. Evolution of ICTs in open and distance educational system is reforming the entire organizational and functional structures of universities and Institutions. Initiation of ICTs in education has changed the state of distance educational system in respect of; curriculum, role of teacher, organizational structure, management and learning environment of distance educational system. TOUT (2013)[133] opined that the amazing benefits of using ICT in distance education system are mentioned as follows;

ICT technologies have made it achievable to deliver lessons/ courses in a faster and easier manner in distance education by using computer-based or internet-based technologies including: computer, Internet, mobile telephones, television, online and video conferencing, social media and many others. Schedules/rosters, resources, assignments and video clips can also be uploaded for learners at the institute website.

Usage of ICTs encourages interaction and collaboration between teachers and learners, and among learners in distance education. Collaboration and interaction among students creates important experiences for learning. Communication and collaboration tools like telephones, cell phone, SMS, online forums, chat, blogs, social media platforms and e-mail can facilitate communication and discussion for meaningful learning experience among student. With the use of word processing programmes ICTs are helpful for teachers in preparing their own instructional and visual materials.

Sending online assignment, questionnaire and submitting responses online, participating in discussion fora, blogs are modern approaches of evaluations which are being applied successfully with the help of ICTs. Educational research**:** Research includes data collection,

interpretation and analysis and reporting as important areas. E-mail, computer programs like MS Word, MS Excel, and Statistical Package for Social Sciences (SPSS) are quite useful technologies.

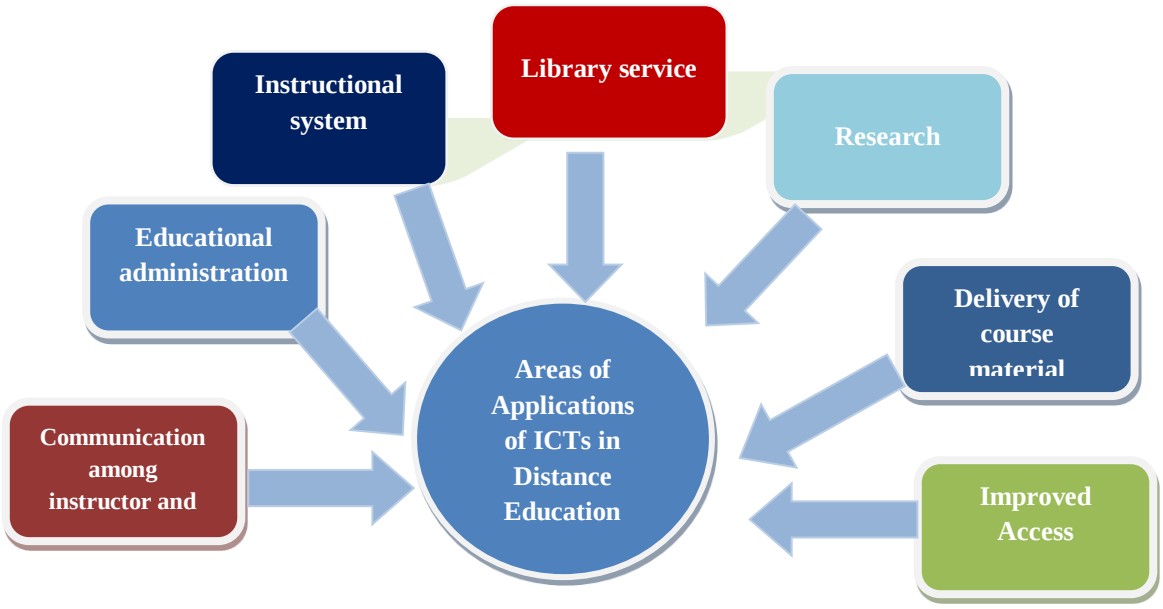

Figure 2: The Applications of ICTs in Distance Education

Influence of Accessibility of Information and Communication Technology on Instructional Delivery and Research

Information is a resource for academic research. It is a resource for national or societal development, which to a larger extent is dependent upon the quality of available research system in a given country or region. The universities are the bedrocks for research, and they require efficient and quality access to information to support instructional delivery and research activities of their academic staff. According to Dulle (2002)[121] Access to information is one of the most important pre-requisites for an efficient, productive and relevant research system. Researchers must obtain timely and relevant information from various sources for effective research.

Dulle (2005)[121] opined that the Internet is a worthwhile tool for scholarly research, and it is therefore expected to have a significant impact on research among academic staff in Nigeria universities. Their survey indicated that 64.2% of academics at the University of Ghana were in affirmation that Internet use has a positive effect on productivity. When asked to rank the usefulness of Internet in research, it was reported that 69.4% of the respondents said it was useful. Ojedokun and Owolabi (2003)[130] conducted a study to assess the effect of the use of the Internet in research by academic staff at the University of Nigeria. The results showed that the respondents perceived that the Internet is a very useful in research and positively impacted on productivity.

Fatoki (2004)[122] observed that with the appearance of the digital age, Nigerian academic staff is relying on electronic resources to support their research in the universities. According to Fatoki (2004)[122], the Internet was first connected in Nigeria in the 1990s and since then many organizations and educational institutions have been connecting to the global network just to improve their corporate or academic productivity. In a study by Ani and Biao (2005)[118] using academic scientists in four Nigerian universities as respondents, it was found that 30.4% of the respondents answered in affirmative that, increase in productivity is one of the effects of access and usage of modern ICT facilities and electronic resources on scientific research in Nigeria.

Popoola (2008)[131] in a survey of social scientists in 13 Nigerian universities similarly opined that access and use of electronic information sources by lecturers could lead to increase in productivity. In a survey of 1,061 researchers in Africa by Foster, Heppensta, Lazarz, and Broug (2008)[122] a low level of access and use of ICT resources by the respondents was reported, the paper concluded and postulated that increase in access and use of electronic resources would have a positive effect on productivity of Nigeria in international journals. A study by Nwezeh (2010)[129] to assess the impact and usefulness of the ICT facilities on research by academic staff

in Obafemi Awolowo University, Nigeria, indicated that almost all the respondents perceived that, the Internet is a useful tool for their research activities. A similar finding was obtained by Ajala (2010)[129] where most academics in Ladoke Akintola University of Technology in Nigeria perceived the Internet as impacting positively on their research work.

Tiamiyu (2000)[133] did a survey to assess the perceptions of personnel of Nigerian federal public agencies of the impact of information technology (IT) use on their work including research. It was found that only 0.8% of the respondents in the survey agreed that there is a positive impact of Information Technology use on their work. He attributed the low level of perception of the impact of IT use in Nigeria on productivity on low level of investment on IT which led to poor understanding of the potential of IT by the staff. Similar result was obtained by Jimba and Atinmo (2000)[138], who found in their study that there is significant association between access and use of electronic information resources and publication output of researchers in Nigeria.

Ehikhamenor (2003)[121] investigated the use of Internet resources in Nigeria with the aim of determining if it has any positive influence on the productivity of academic scientists in Ten Nigerian Universities. His review of literature had shown that the use of electronic journals has been positively associated with scientific productivity. But the findings of the study revealed that: very few of the scientists agreed that the use of the Internet had greatly facilitated their research work or that the Internet facilitated higher productivity (Ehikhamenor, 2003)[121].

In specific terms, 89.3% of the respondents strongly agreed that the use of ICT resources facilitates higher productivity. The study concluded that the extent to which access and use of the ICT facilities meet the research needs of scientists in Nigerian universities is significant, and its contribution to increase in productivity is therefore significant.

Influence of Information and Communication Technology on Education

ICT is an acronym of Information and Communication Technology. The word information according to World Health Organization (WHO) cited by Nwachukwu (2008)[129] is a message intended for communication. It refers to knowledge and ideas which are provided in order to increase awareness in people. (ICTs) are information handling tools that are used to produce, store, and distribute and exchange information. These tools are now able to work together, and combine to form networked world which reaches into every corner of the globe (UNDP Evaluation Office, 2001)[133].

ICT is an umbrella term that consists of any communication tools encompassing radio, television, cellular phones computer and networks hardware and software, satellite systems as well as various services and application associated with them such as Video conferencing and distance learning and also stressed that ICT is the key tools giving birth to the contemporary e-commerce , e-Government e-Medicine and e-education, teleconferencing, data conferencing, and video conferencing, and also consisted all types of technologies for manipulating and communicating information (Issa, Daramola, Aladesusi, & Udoh, 2017)[124]

The potentials of ICT to improve the quality of instruction, transform education, improve school management and improve access to education have been stretched by the researchers. World Bank (2003)[134] asserted that ICT has the potential for enhancing the tools and environment for learning; it allows materials to be presented in multiple media, motivates and engages students in the learning process, fosters inquiry and exploration and provides access to worldwide information resources, among others.

The quality of students' learning will be improved through their access to the needed content through ICT facilities especially, the internet. ICT can enhance learning and increase

information available to learners, thereby stimulating collaborative learning (World Bank, 2003)[134]. ICT can also empower the learners with information technology responsiveness and skills which are very vital for success in the contemporary knowledge (Kante, 2003)[139].Distance learning is improved through ICT and can provide flexible learning prospects with collaborative aspects and rapid communication among learners and between the learners and academic mentors (World Bank, 2003)[134]. Also, ICT can provide opportunities for individuals with disabilities to have access to qualitative education. They can be relevant as assistive technology adaptive technology and as a tool to support knowledge (Jurich & Thomas, 2002)[125].

ICT is can be described as any communication devices encircling radio, television, cellular phones, computer, social network and satellite system as well as stimulated terms like e-learning, e-teaching, virtual teaching and learning and e-training among others that are developed around the field of education (Makinde & Yusuf, 2017)[127] ICT significantly improve students problem solving skills, provide opportunities for students constructed learning, increase students' collaboration on projects, increase mastery of vocational and workforce skills. Increase the preparation of students for most careers and vocations and improve confidence and attitude of students (Cradler & Bridgforth, 2002)[120].

Olatokun (2007)[130] studied research collaborators of 10 lecturers in Nigeria University and reported that publication activities of lecturers were greatly enhanced by the use of e-mail, file/document exchange, and collection. ICT resources such as video content and digital movies making in laptop, computing and handheld technology has been used in the classrooms to support and enhance learning. Similarly new uses of technology such as podcast are constantly emerging (Marshall, 2002)[139]. Obielodan, Amosa and Alla (2017)[129] revealed that ICT is the act of processing, transmitting and retrieval of information via electronic devices; it is tools that are

used for producing, storing, processing, disseminating and exchanging information. It is used for solving and finding lasting solution to the problems and providing needed services in the various human endeavors.

Adeshina, Ogunlade and Fakomogbon (2017)[116] explained that ICT is a method of coding, decoding, storing, and transferring of ideas and information through electronic tools, these devices is classified as hardware and software. The hardware includes central processing unit (CPU), monitor, keyboards, printers, radio and telephones. While software comprises Microsoft word, excel, corel draw social science statistical package (SPSS), opera mini and Google chrome among others, are all use to innovate educational system, methods and management.

Marshall (2002)[127] opined various technologies deliver different kind of content and serve different purposes in the classroom. Word processing and e-mail promote communication skills, database and spreadsheet programme promotes organizational skills; and modeling software promotes the understanding of science and Mathematical concepts. Prensky (2005)[131] opined that even the cell phones can be used to learn. Lei and Zhao (2006)[126] observed that each technology is likely to play a different role in student learning.

ICT is a shorthand for the Computers, software, networks, satellite links and related systems that allows people to access, analyze create exchange and use data (Association of African Universities, 2000)[118]. The prevalence and rapid development of ICTs has transformed human society from the information technology age to the knowledge age (Galbreath, 2007)[122]. ICT refers to technological devices that are used to record, store, process, retrieve and transmit

information anywhere in the world, they reiterated that introduction of ICT into education system could lead to individualized learning in several environment (Ayelagbe & Onasanya, 2017)[118]

Furthermore, ICT resources are instructional delivery tools used to discover, explore, solve problems, interact, reflect reasons and learn concepts, in the classroom. This innovation permits alternative types of educational patterns for facilitating the teaching and learning process (Umoren, 2006)[134]. Another type of ICT resources is the virtual teaching which entails instructional delivery through teleconferencing, the video conferencing technique. Web based instruction uses internet and the World Wide Web (WWW) as the major component of learning materials and instructional resources for effective instructional delivery. Audio Media (instructional slides and tutorials) are technology and learning resources made and written into compact disks, graphics and texts. Through the power point, instructional delivery is impactful to slow and fast learners (Umoren, 2006)[134]. ICT helps to support and enhance learning in education institutions. This includes the use of ICT technology as a supplement to traditional classrooms, online learning or mixing the both modes (OECD, 2005).[130]

E-learning: it has been applied in different contexts, such as distributed learning, hybrid learning, and online-distance teaching (Maltz, 2005)[127]. In an e-learning environment, a variety of tools and technologies are employed, for example, internet mediated teaching, Web-based education, T.V and radio broadcast, virtual classrooms and distributed learning (Maltz, 2005)[127].

Online learning takes place via the web and may include text, graphics, animation, audio, video, discussion boards, and e-mail. Online learning is typically on demand and self-directed but may include synchronous chat, web based teleconferencing (audio graphics) or similar technology (Brown, 2008)[119].Distance Learning is a learning that takes place when the instructor and the learner are not in the same physical location. It can also take place if the instructor and

the learner are in the same location but not at the same time. Today, distance learning is carried out via a number of media ranging from postal mail to teleconferencing or the internet. Distance learning (learner focus) and distance education (instructor focus) are often used as interchangeable terms. (Information Technology Professional (ITP, 2008)[124]

Blended learning combines online with face-to-face learning. The term blended learning is used to describe a solution that combines several different delivery methods, such as collaboration software, web based courses, Electronic Performances Support System (EPSS) and knowledge management practices. Blended learning is also used to describe learning that mixes various event based activities including face-to-face classrooms, live E-learning, and self-paced instruction (OECD, 2005)[129]. M-learning or Mobile learning refers to the use of handheld devices such as PDAs, Mobile phones, laptops and other handheld information technology device that can be used in teaching and learning (Isisag, 2013)[124].

Influence of Lecturers' Demographic variables characteristics on the Utilization of Information and Communication Technology Facilities

Scholars have hypothesized that there is disparity in accessibility and utilization of ICTs and electronic resources by gender whether in academia or in the larger society. Kaminer (1997)[125] reported that a typical Internet user, as of 1995, is most likely a white male with high socio-economic status. This shows that the relative increase in Internet use by females may be of recent history. According to Costa and Meadows (2000)[120], male economists tended to use electronic resources more than the female ones. Dutta-Berman (2002)[121] in a study of demographic correlates on Internet use affirmed that, the males are most likely to use the Internet than the females.

Osunade and Ojo (2006)[131] affirmed this as they found that male students used the Internet at the University of Ibadan, Nigeria than their female counterparts for their academic

activities. Alao and Folorunsho (2008)[117] also reported the existence of gender difference in Internet use. The findings of their study of Internet use in Ilorin, Nigeria revealed that males used the Internet than females. This trend was confirmed by Nwezeh (2010)[129] that the Internet is mostly used by men, while female users are increasing more slowly.

But in contrast, other researchers have reported that females used the Internet more than males. A survey by Akporido (2005)[117] on Internet use in Delta State, Nigeria indicated that more females (56%) used the Internet than males (44%). Fourie and Botham (2006)[122] in her study on digital divide reported that male students scored lowest marks in ICT courses than females in the University of Pretoria, South Africa during their assignment grading, but her review indicated that gender differences do not have impact on the use of online resources. Deng (2010)[120] in a study of emerging patterns polish trends in use of electronic resources in Nigeria higher education environment found that females (55.7%) used electronic resources more than males (44.3%); further analysis revealed that there was no significant difference in the use of e-resources by gender.

Dulle (2010)[121] pointed out that gender difference has affected the rate of adoption of ICT and electronic resources in developing (African) countries. In view of this, Rhima (2011)[131] opined that technologies are not gender neutral and observed that; while there is acknowledgment of the potential of ICT as the tool for the promotion of gender equality and the empowerment of women academically, a gender divide has also been identified, manifested in the lower numbers of women accessing and using ICT compared with men. Gender is an essential portion for utilizing technological tools in teaching and learning process, and the author further stated that many research findings indicated gender differences presence especially

during the usage of technological tools in instructional delivery (Adedokun-Shittu, Muhammad, & Abdu, 2017)[116]

A study by Amkpa (2007)[117] revealed that there exists a significant difference in computer use between male and female students at the University of Maiduguri, Nigeria. The finding was similar in terms of attitude toward the use of computers, as it was found that females' attitude towards computers were comparatively negative. The paper recommended that female students should improve their attitudes toward the use of computers.

Rhima (2011)[131] viewed that if the existing gender disparity in the use of ICTs is not tackled, it will impede the productive capacity of women especially in teaching and research and publication when compared with men. She therefore suggested the need to address the ICT gender divide through appropriate ICT policy framework that will spell out gender issues in order to encourage the use of ICTs by the female gender in the society, particular in the educational and academic environments.

In Sub-Saharan Africa women are marginalized in education and in the use of ICT. Women have the smallest chance for education, and those who receive it are generally from the more privileged families. Of those few women who do go to the university, mathematics and computer science majors are at 20% of the total. Women currently constitute about 43% of the labor force, yet many women work in the informal labor markets as either non-paid employees or self-employed. However, many women's groups and organizations are fighting for equality in education and ICT access. An example is Uganda's WOUGNET (Women of Uganda Network) which was initiated by several women organizations to develop the use of ICTs as tools to share information and address issues collectively (Rhima, 2011).[131]

Deng (2010)[120] in a survey aimed to investigate the extent of use of electronic resources in an Nigeria university among academic staff and students, found that respondents less than 29

years were the major users of electronic resources (52.4%), followed by those within the age of 30-39 years (21.8%), 40-49 years (12.8%), 50-59 years (11.1%) and those above 60 years (2.0%). This revealed that the use of e-resources by the respondents decreases with age. His findings were in line with his view that the age of a user usually has a role to play in using electronic resources as younger generations tend to use computers more effectively (Deng, 2010)[134]. Kinengyere (2007)[125] explained that older generation of researchers use ICTs and e-resources less because most of them have a low level of IT literacy. The trend observed by Deng (2010)[120] was also observed by Nwagwu, Adekannbi and Bello (2009)[129] in a survey to explore Internet use by students of the University of Ibadan, Nigeria. They found that, majority of users of the Internet are those within the age range of 19-24 years (45.8%), 25-30 years (33.8%), and 31-36 years (7.5%).

King (2009)[125] in a study of information seeking behavior reported that older academic staff are more likely to access and use print than e-resources in their research; that is e-resources are less used among the older academic staff in the universities. Gamage and Halpin (2007)[122] in a survey of the use of ICTs found that most of the ICT users are the youths and adults who are below the age of 35 years and the most active group of ICT users are aged 12-25 years.

Amkpa (2007)[117]found that there is a significant difference in computer use with age among undergraduate students of the University of Maiduguri, Nigeria. A study by Alao and Folorunsho (2008)[117] showed that the Internet cybercafé in Ilorin were used mostly by people within the age of 21-30 years. Park (2010)[131] opined that the younger people learn about technology easily and found that younger people use the social network site (SNS) more than the older ones. From the literature, the trend in access and use of e-resources is reportedly decreasing with age of the academic staff.

In view of the perceived benefits of the ICTs/electronic resources across academic disciplines, scholars have had vested interest in investigating the extent of accessibility and utilization of these resources in different disciplines/fields of specialization in the universities around the world, especially within the past two decade. Ehikhamenor (2003)[121] similarly found that there were differences in the use of electronic resources across scientific disciplines in Nigerian universities. Typically, the findings of the survey revealed that chemists and mathematicians make greater use of electronic journals than others, and physicists and computer scientists were the highest users of web resources. However, Ehikhamenor (2003)[121] explained that the use of e-resources is dependent on whether the content of such resource meets the need of academic staff in a given discipline.

Shanahan (2009)[132] in her review observed that access to electronic resources vary across and within health professions; and further verified this with an empirical study which confirmed variation of accessibility and utilization of e-resources with area of specialization within the health profession. Popoola (2008)[131] in his review reported that CD-ROM databases are being used more by social scientists than the scientists and humanists in Nigerian universities. This was explained to be due to the fact that wide range of information in the social science is available in CD-ROM databases. Nwagwu, Adekannbi and Bello (2009)[129] observed a variation in Internet use by disciplines among the students of the University of Ibadan, Nigeria. The findings of the study indicated that science students are the dominant users of the Internet especially for academic purposes in the university. He ascribed this to inequitable distribution of Internet access in the university.

Theoretical Framework for the Study

The theoretical frameworks that are selected to guide the study are: Technology Acceptance Model (TAM), and Unified Theory of Acceptance and Use of Information Technology (UTAUT) – otherwise known as user acceptance of information technology theories/models.

The Technology Acceptance Model (TAM) was developed by Davis in 1989 to explain and understand factors affecting the acceptance and use of computer technology or ICT infrastructure in general in organizations/institutions (Davis, 1989[120], 1993[120], Johnson, 2005[124], Lee, Kozar & Larsen 2003[126], Ramayah, 2006)[131]. Basically, the Technology Acceptance Model (TAM) has been used by many researchers to explain and understand individual's acceptance and intention to use variety of ICT. The TAM postulates that behavioural intention determines the actual use of ICT. However, behavioural intention is jointly determined by two variables: perceived usefulness and perceived ease of use (Saade, Nebede & Tan, 2007)[132]. Thus, the TAM assumes that perceived usefulness and perceived ease of use influence attitude toward behavioral intention to use ICT. Davis (1989)[120] confirmed that the aim of the TAM is to provide better measures for predicting and explaining use of ICT in organization/institution).

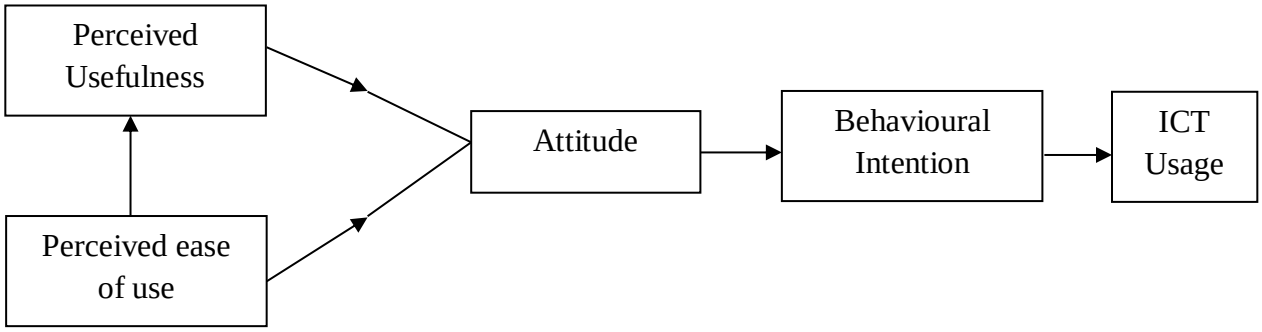

Figure 3: Technology Acceptance Model (TAM)

Source: Davis, Bagozzi and Warshaw (1989)

Basically, the TAM is a version of the TRA (Dishaw, Strong & Brandy, 2002[121] Ghobahloo, Zulkiflu & Aziz, 2010)[122]. According to Ghobahloo, Zulkiflu and Aziz (2010)[122], the TAM inferred that perceived usefulness and perceived ease of use are of main significance regarding computer acceptance behaviors. The perceived usefulness and perceived ease of use are said to influence behavioral intention which is affected by attitude towards the behavior as well-established in the TRA. Put, differently, attitude towards behavioral intention to use ICT is determined by perceived usefulness and perceived ease of use. Observably, the TAM is said to exclude the original variable subjective norm from the TRA. But, in general, these two theories (TRA, TAM) state that behaviour is determined by the intention to perform the behavior. Intention itself is determined by attitude towards the behavior (Dishaw, Strong & Brandy, 2002)[121]. Moreover, the TAM presupposes that the use of ICT in organization/institution (university) by employee/academic staff to be voluntary.

According to Davis (1993)[120], attitudes towards the behavior - use of ICT is a major factor that determines whether a potential user (academic staff) would actually use ICT (or access and use of electronic resources) or not. Hence, attitude towards ICT usage affects actual use of ICT, with perceived usefulness and perceived ease of use as the determinants of attitude (Koufaris, 2002)[126]. This is reliable with the proposition by Davis (1993)[120] that attitude toward using is in turn a function of two beliefs: perceived usefulness and perceived ease of use. Thus, perceived usefulness and perceived ease of use have helped in application of the TAM to explain and predict acceptance of the use of ICT by different people (academic staff) in university.

Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance (Davis, 1989)[120]. Perceived usefulness is a concept that explains the expected overall effect of use of ICT on job performance

or productivity (Davis, 1993)[120]. Davis (1989)[120] therefore posited that a system high in perceived usefulness, in turn, is one for which the user believes in the existence of a positive user-performance relationship. In other words, if a system (ICT) has a high degree of usefulness (productivity), it would be used by the potential user (academic staff).

Thus, in line with the work of Saade, Nebede and Mak (2009)[132], perceived usefulness is defined in the present study as the degree to which an academic staff believes that accessibility and utilization of ICT resources will enhance or increase his/her productivity. Consequently, from the concept of perceived usefulness, it is therefore postulated that academic staff would readily access and use variety of electronic information resources in his/her research, and teaching if he/she believes that, this would definitely increase his/her productivity. This leads to the hypotheses that, electronic information resources are research tools for productive academic staff in Nigeria universities. In other words, accessibility and utilization of ICT facilities would have a positive effect on productivity of academic staff in Nigeria universities.

Perceived ease of use is the degree to which a person believes that using a particular system would be free from effort (Davis, 1989)[120]. So perceived ease of use deals with the situation in which little mental/physical effort is required in ICT usage in organization/institution (university) by potential users (academic staff). Hence, in the present study, perceived ease of use is defined as the degree to which academic staff believes that accessibility and utilization of electronic ICT resources will be free from effort. However, researchers have observed that perceived usefulness has a more significant influence on use of ICT than perceived ease of use (Tibendera & Ogao, 2009)[133]. Specifically, Tibendera and Ogao (2009)[133] observed that usefulness was more significantly affected by usage than ease of use and that perceived usefulness had a stronger correlation with user acceptance of technology. Thus, to guide the

study, using TAM, it is proposed that academic staff that access and use electronic information resources frequently are expected to be more productive than those who do not.

Davis, Bagozzi and Warsaw (1992)[120] used the TAM to show that people's intentions to use computers are influenced mainly by their perceptions of how useful the computers are for improving their job performance. Application of the TAM by Koufaris (2002)[126] on online consumer behaviour has also confirmed that perceived usefulness was more an important predictor of intended system usage. Klopping and McKinney (2004)[125] affirmed that the TAM is one of the most effective tools to study user acceptance and use of ICT among other competitive theories/models. They used the TAM, to predict and explain the impact of the Internet on e-commerce. A review by Johnson (2005)[124] has also revealed extensive application of the TAM to study users' acceptance of microcomputers, World Wide Web, Software, and decision support system in different organizations/institutions across diverse cultures.

In their study, Saade, Nebede and Tan (2007)[132] used TAM to test students' behaviour in a multimedia learning environment, specifically, the use of Internet-based technologies by the students, the TAM was found to be a solid theoretical model that provides better understanding of user behavior on the system and a multimedia acceptance model (Saade, Nebede & Tan 2007)[132]. In another study, Saade, Nebebe and Mak, (2009)[132]applied the TAM to investigate cultural variation of the use of Web-based Learning System (WLS) between the Chinese and Canadian students, with the finding that the use of ICT differs across cultural background. Recently, Sheikhshoaei and Oloumi (2011)[133] applied TAM to establish its validity on librarians in engineering faculties of public universities in Iran. The findings confirmed that perceived usefulness have considerable influence on use of ICT by the librarians and therefore validated the model.

Although, the TAM has been reported as the most widely used and robust theoretical model in Information Science (IS) in the study of acceptance and use ICT, observably it has some limitations (Al-Shafi & Weerakkody, 2009[117], Koufaris, 2002[126]Lee, Kozar & Larsen, (2003)[140], Sheikhshoaei & Oloumi, 2011)[133]. According to Al-Shafi and Weerakkody (2009)[117], the basic strength of TAM is derived from its power and capability to predict the use of ICT in variety of organizations/institutions globally. Additionally, the TAM is said to provide factors which lead to ICT acceptance, provides room for extensions and elaborations better than other competing models while its weaknesses are its failure to determine barriers that hinder technology adoption and use (Tibenderana & Ogao, 2009)[133]. However, in spite of its numerous applications, validations and robustness, and high prediction capability on the use of ICTs, TAM has been found to exclude some important sources of variance and does not consider challenges such as time or money constraints as factors that would prevent an individual from using ICT. (Al-Shafi & Weerakkody, 2009)[117]. Hence, the Unified Theory of Acceptance and Use of Information Technology (UTAUT) were developed to address the limitations/weaknesses of the TAM (Al-Shafi & Weerakkody, 2009)[117].

The Unified Theory of Acceptance and Use of Information Technology (UTAUT)

In view of the observed weaknesses of individual theories/models in the study of information technology acceptance, Venkatesh, Morris, Davis, and Davis (2003)[134] reportedly examined eight prominent models, empirically compared them, and then formulated a new model or "unified model". The unified model is referred to as the Unified Theory of Acceptance and Use of Information Technology (UTAUT). The UTAUT integrates salient elements from eight theories/models: the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), the Motivational Model (MM), a model

combining the TAM and the TPB (C-TAM-TPB), the model of PC Utilization (MPCU), the Innovation Diffusion Theory (IDT), and the Social Cognitive Theory (SCT) (Ghobakloo, Zulkifli & Aziz, 2010[122], Venkatesh, 2003[134], Wu, Tao & Yang, 2007)[135].

According to the UTAUT, the four main determinants of behavioural intention and actual ICT usage are performance expectancy, effort expectancy, social influence, and facilitating condition. These variables are said to be moderated by age, gender, experience, and voluntariness of use (Al-Shafi & Weerakkody, 2009[117], Ghobakloo, Zulkifli & Aziz, 2010[122], Suhendra, Hemana & Sugiharto, 2009[133], Wu, Tao & Yang, 2007)[135]. The empirical testing and validation of the UTAUT proved that, the UTAUT model outperformed the eight individual theories/models (Ghobakloo, Zulkifli & Aziz, 2010[122], Venkatesh *et al*., 2003)[134]. This is confirmed by Wu, Tao and Yang, (2007)[135] that the explanation or predicting strength offers by the UTAUT model for technology acceptance behaviour is up to 70%, which is more effective than any of the known models from the past.

Performance expectancy is the degree to which an academic staff believes that access and use of information technology/electronic information resource will help him/her to enhance his research performance and the delivery of instruction. Performance expectancy now replaces perceived usefulness in the TAM as a major measure that motivates academic staff to access and use electronic resources in research and publication.

Effort expectancy is the degree of ease of access and use of ICT/electronic information resource. Social Influence is the degree to which academic staff perceives that his/her social/professional peers believe he/she should access and use ICT resource in research.

Facilitating condition is the degree to which an academic staff believes that, institutional ICT infrastructural facilities are available to support access and use of electronic information

resources. Put different, the degree in which an academic staff believes that his/her university has an enabling electronic information environment that will facilitate him/her to access and use electronic resources in teaching and research. So, the performance expectancy and facilitating conditions are the two UTAUT variables that are used to guide the present study if an academic staff believes that access and use of electronic resources in research and instructional delivery may have a positive effect on his productivity. From UTAUT, the extent of access and use of electronic resources depends on facilitating condition (electronic information environment).

The UTAUT has been a widely used model in information technology acceptance study. Wu, Tao and Yang (2007)[149] used the UTAUT to explore the behaviour of 3G mobile communication users in Taiwan. It was found that performance expectancy and facilitating conditions have had significance influence on behavioural intention of people to use 3G mobile communications in Taiwan. Tibenderana and Ogao (2009)[133] applied the UTAUT model to study the use of hybrid library services in Ugandan universities; the findings validated the model as an efficient and robust tool for technology acceptance studies. Dulle and Minishi-Majanja (2011)[121] used the UTAUT model to study the acceptance and usage of open access in Tanzanian universities; the results showed performance expectancy as a major factor affecting the researchers' behavioural intention to use the open access. A study by Al-Shafi and Weerakkody (2009)[117] focused on application of UTAUT model to investigate the adoption and diffusion of e-government services in Qatar. Hence, Ghobakloo, Zulkifli and Aziz (2010)[122] reported that the UTAUT model is robust across cultures through increasing understanding of cultural impacts of IT acceptance.

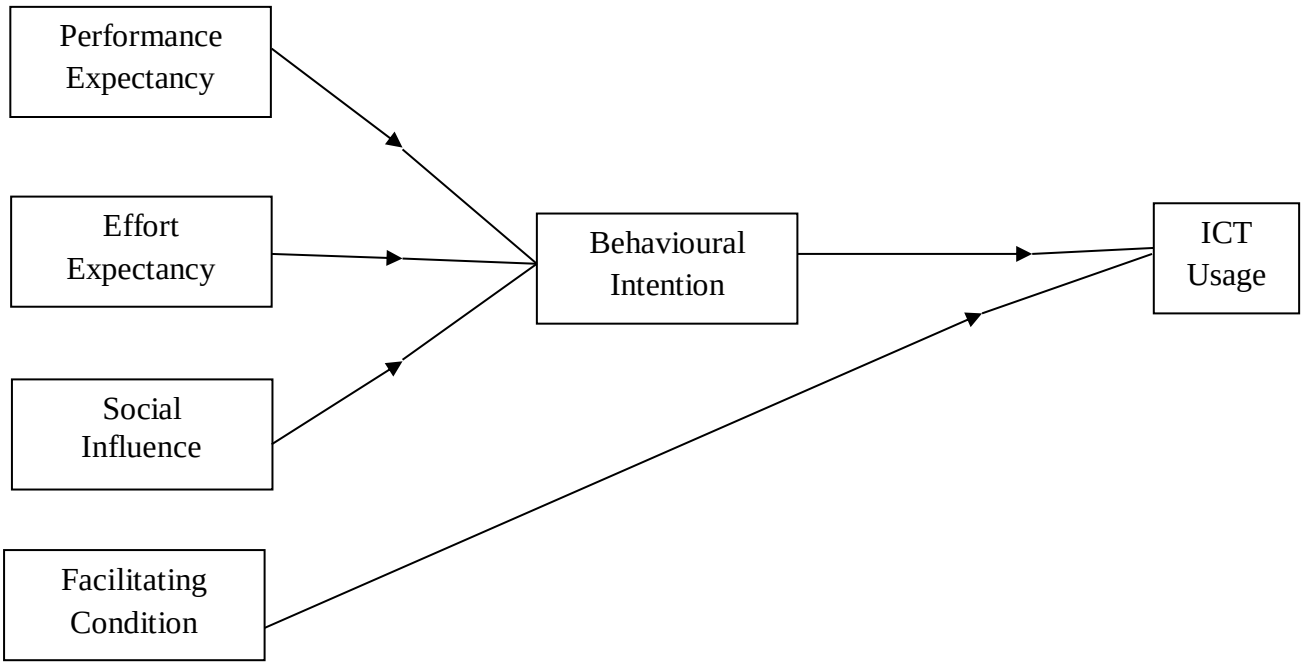

Figure 4: Unified Theory of Acceptance and Use of Information Technology (UTAUT)

Source: Venkatesh et al. (2003)

The Conceptual Model for the Study

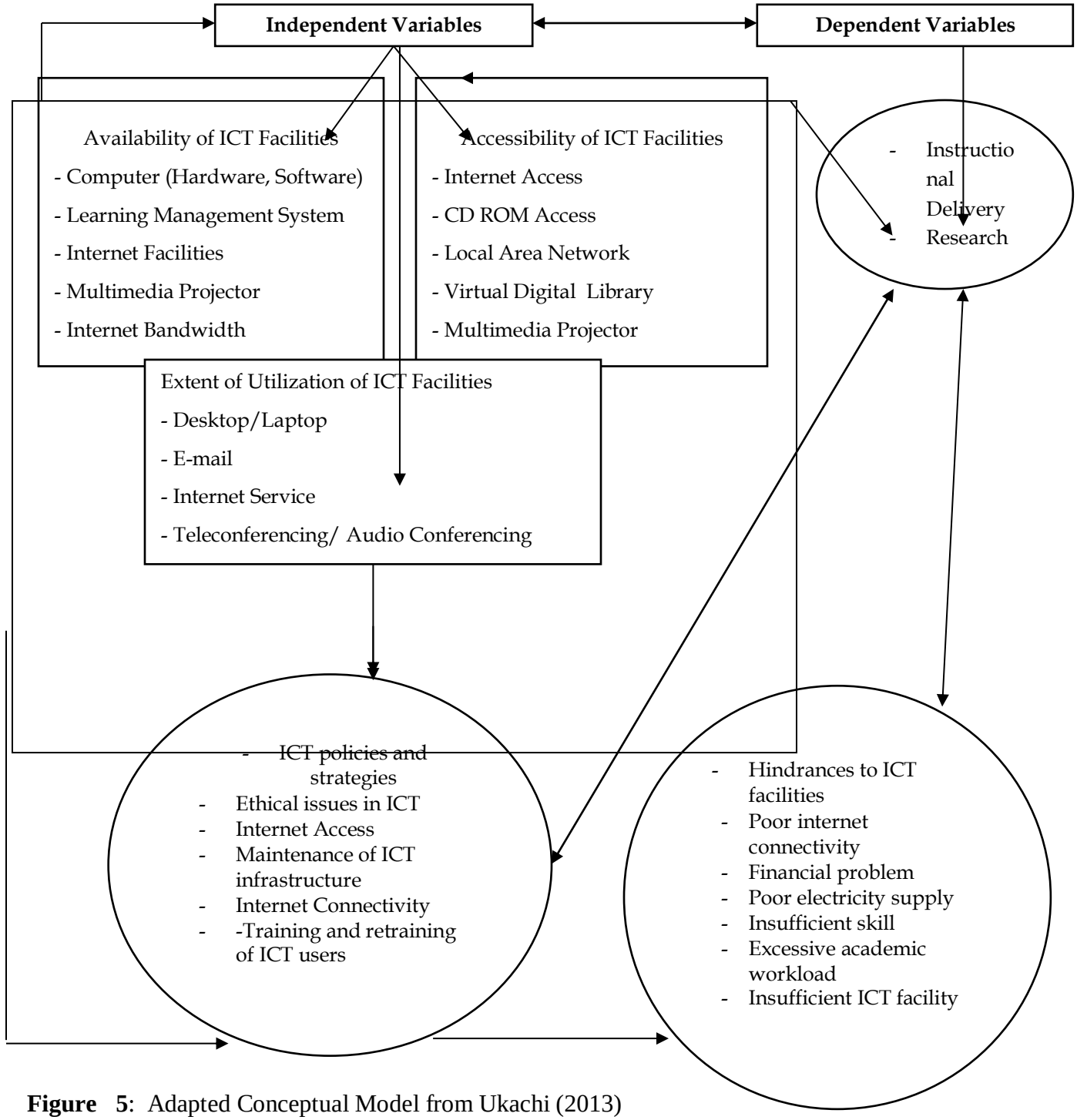

Figure 5: Adapted Conceptual Model from Ukachi (2013)

The Conceptual model presented above explains the process by which the study was carried out. The model projected the relationship and interaction between the independent variables of the study; Availability, Accessibility, Utilization, ICT policy and strategy and Dependent Variables; Instructional Delivery and Research. Simply put, it illustrates that the independent variables can Influence Dependent Variables if the hindrances towards ICT utilization are addressed.

Failure to address it may perhaps impede direct influence of independent variable on dependent variable. Conceptual and theoretical model used in the study have significant implication for the topic under study. The conceptual model revealed that the independent variables can influence dependent variable. Similarly, all four UTAUT variables concurred with this. For instance, performance expectancy stated that access and use of ICT facilities can enhance research performances and delivery of instruction. Effort expectancy stated that lecturer can easily access and use ICT facility for research and delivery of instruction. Facilitating condition stated that institutional ICT facilities are available to support access and use of ICT facilities for research and instructional delivery. The models concurred that independent variable can influence dependent variable if the hindrances toward ICT utilization are addressed.

Appraisal of the Reviewed Literature

The aim of this literature review is to highlight writings made by scholars in area related to this study. The literature materials reviewed so far have a lot of information to offer in respect to this study that focus on Information and Communication Technology Utilization for Open and Distance Learning in Universities in South-west, Nigeria. The various major areas of study examined were grouped into; the overview of the variables

under study, the theoretical and conceptual model for the study. The theoretical framework centered on TAM and UTAUT model, while the conceptual model was also constructed for the study by the researcher.

The review of literature revealed low availability, accessibility and utilization of ICT facilities in most of the universities surveyed due to some hindrances like fluctuating power supply, high cost of ICT facilities, insufficient skill, and excessive academic workload, among others. However, the review showed an appreciation and acceptance of ICT facilities as important information resources that enhance academic and research output through the provision of timely, up to date and easy access to information.

In the review of literature, the researcher discuss extensively on the availability, accessibility and the utilization of ICT facilities in conventional universities in South-west, Nigeria. None of the literature reviewed specifically dealt with the variables under study in ODL. As a result, the researcher intended to fill the gap created by investigating the ICT utilization for ODL in South-west, Nigeria.

CHAPTER THREE

METHODOLOGY

This chapter presents the methods that were employed in carrying out this study. It was presented under the following sub-topics: Research Design, Sample and Sampling Techniques, Research Instruments, Validation of Research Instruments, Procedure for Data Collection, and Data Analysis Techniques.

Research Design

This study adopted quantitative research design of survey type; because the researcher measured variables; assessed the impact of the variables (Independent Variables); (availability, accessibility, utilization, ICT policies and strategies, factors which determine ICT utilization) on the outcome (Dependent Variables) (teaching and research in ODL), and applied the result to a large number of people.

Sample and Sampling Technique

The population of the study consisted of all one thousand nine hundred and eighty four (1,984) lecturers in ODL in Nigeria. The target population was all one thousand and seventy five (1,075) lecturers in ODL in South-west. The sample population consisted of six hundred and ninety three (693) lecturers in five ODL institutions in South-west Nigeria. The four conventional dual-mode ODLs and one non-conventional single mode ODL were used for the study. Specifically, respondents from CDLs of University of Ibadan, Obafemi Awolowo University, DLI, University of Lagos and National Open University of Nigeria (NOUN) and ODL center LAUTECH, were selected for the study.

Purposive sampling technique was used to select sample from the selected ODL institutions. Researcher adopted purposive sampling technique because the interest of the

research was on ODL, and there is limited number of accredited ODL institutions in South-west Nigeria. The researcher used Israel Model of determining sample size in determining the total number of respondents selected in each selected ODL. The instrument was distributed to a sample of six hundred and ninety three (693) out of which six hundred and sixty two (662) was responded to and analyzed in the study.

Table 3:
List of Open and Distance Learning, Types, Target Population and Proportional Samples
at ±5% Precision Level, Confidence Level is 95% and P.5

ODLs	Types	Target Population	Proportional Sample Size
CDL, University of Ibadan, Ibadan	Dual mode	225	144
CDL,Obafemi Awolowo University, Ile-Ife	Dual Mode	275	163
National Open University of Nigeria (NOUN)	Single mode	250	154
ODL centre, LAUTECH	Dual mode	175	122
DLI, University of Lagos	Dual mode	150	110
Total		**1,075**	**693**

The target population of five (5) ODLs to be selected is 1075. The sample size is ± 5% precision level, confidence level is 95% and P.5 which is equivalent to six hundred and ninety three (693).

Research Instrument

The instrument for this study was a researcher-designed questionnaire, entitled; "Information and Communication Technology Utilization for Open and Distance Learning in Universities in South-west, Nigeria" (ICTUODLU).The questionnaire was structured in a simple language so as to enable the respondents to provide pertinent answers to the questions based on their knowledge.

The questionnaire contained two major sections, which were Sections I and II. Section I, comprised information on respondents' demographic characteristics, which include: Name of the University, Faculty and Department, Area of Specialization, Academic Qualifications, Age, Gender and Year of teaching.

Section II was sub-divided into seven (A-G). These subdivisions are:

A. Availability of ICT Facilities (15 items)
B. Accessibility of ICT Facilities (13 items)
C. Extent of Utilization of ICT Facilities (16 items)
D. ICT Policy and Strategy in ODL (12 items)
E. Factors that facilitate the ICT Utilization (7 items)
F. Influence of ICT Accessibility on Instruction Delivery and Research (7 items)
G. Hindrances to ICT Facility Utilization (15 items)

The response mode for the items was of the Likert Scale of Strongly Agree (SA), Agreed (A), Disagree (D) and Strongly Disagree (SD).

Validation of the Research Instrument

The face and content validity of the instruments were ascertained by the researcher's supervisor and other experts in the Department of Educational Technology for scrutiny and value reviews. The judgment and assessment of the experts have helped to determine the extent to which the items accurately cover the desired domain of the study.

In determining the reliability of the research instrument, the instrument was subjected to pilot testing using 20 lecturers from NOUN study centre, Ilorin which was outside the area of study, but shares the same characteristics with the study population. The instrument was analyzed using Split-half and Cronbach alpha reliability technique to obtain the Internal Consistency (IC) reliability of: 0.93, 0.80, 0.93, 0.97, 0.80, 0.80, and 0.91, respectively; from Section two (A-G). These figures were considered high enough to make the instrument reliable.

Procedure for Data Collection

A letter of permission was collected from the Head of Department of Educational Technology faculty of Education, University of Ilorin to carry out the study. A Research Assistant was employed and trained to facilitate in the survey (administration of the questionnaire) at the surveyed universities.

The researcher discussed the study with the Head of Department of the area of study and obtained permission to administer the questionnaire to lecturers in their departments. The Research assistant thereafter distributed the questionnaire to the lecturers directly. Some respondents (lecturers) filled their questionnaire immediately, requesting the Research assistant to come back for the remaining questionnaire. Thereafter, the

Research assistant routinely visited the individual respondents in their offices until the completed copies of the questionnaire were retrieved.

In social science research, human beings commonly referred to as participants or respondents are usually subjects of study. This raises fundamental ethical issues on how a researcher can go about the conduct of his/her research without causing any harm to the participants. The researcher should consider the right and privilege of the participants so that his/her research obligation will not be jeopardized. Research involving human participation should be performed with the consent of the participants and always be made to know that their involvement or participation in research is voluntary. Thus, the lecturers used as respondents in this study were informed that their participation in the study is voluntary.

Another ethical issue in relation to the participants (respondents) is the protection of his/her privacy in responding to the questionnaire, this is otherwise referred to as confidentiality in research. In this regard, each respondent was informed in the questionnaire that the data collected will be kept in confidence and will be used for the research purpose only. For the confidentiality of the respondents, the questionnaire should be coded by removal of identifying information about the respondents. In compliance with these requirements, the questionnaire for the study has no provision for the name of the respondents.

On the issue of objectivity and honesty in reporting the findings of the study, the researcher will ensure that only findings emanated from the study will be reported and no manipulations will be done to the collected data in order to achieve predetermined results.

Plagiarism is obviously a serious ethical issue that the researcher will give a serious attention to.

Data Analysis Technique

The data obtained through the instrument was analyzed and interpreted using Descriptive and Inferential Statistics. Frequency Counts, Percentages and Mean were used to answer Research Question one to six and eight. Regression analysis was used to answer Research Question seven; (age, gender, discipline, and academic qualification) of the respondents.

Hypotheses one to four were tested using ANOVA to find out significant difference in availability, accessibility, extent of utilization of ICT facilities and ICT policy and strategy base on the type of the universities under survey.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

This chapter presents the analysis and result obtained from the data based on research questions and research hypotheses stated in chapter one. The results will be discussed under the following sub headings; Demographic information of the respondents, answer to research questions, answer to research hypotheses and summary of major findings

Demographic Information of the Respondents

Table 4:

Distribution of Respondents Based on the Name of Universities

S/N	Name of the Universities	Frequency	Percentage %
1.	Centre For Distance Learning (CDL) University of Ibadan	144	21.8
2.	National Open University of Nigeria (NOUN)	154	23.3
3.	Centre for Distance Learning (CDL) OAU, Ife	144	21.8
4.	Distance Learning Institute (DLI) (UNILAG)	110	16.6
5.	Open and Distance Learning Centre, LAUTECH Ogbomosho	110	16.6
	Total	662	100

Table 6 indicated that the majority of respondents (154, 23.3%) were from National Open University (NOUN) followed by respondents from CDLs University of Ibadan and Obafemi Awolowo University Ife, (144, 21.8%) respectively and DLI and ODL Centre (LAUTECH) Ogbomosho have 110 respondents each representing 16.6%.

Table 5:

Distribution of Respondents by Departments

S/N	Departments	Frequency	Percent%
1.	Psychology	25	3.8
2.	Philosophy	27	4.1
3.	Economics	56	8.5
4.	Political Science	24	3.6
5.	Teacher Education	26	3.9
6.	English Language	21	3.2
7.	Social Work	36	5.4
8.	Administration	67	10.1
9.	Accounting	125	18.9
10.	Arts	20	3.0
11.	Nursing	51	7.7
12.	Management Accounting	58	8.8
13.	Computer Science	29	4.4
14.	Science Education	24	3.6
15.	Educational Foundation	32	4.8
16.	Law	20	3.0
17.	Entrepreneurship	21	3.2
	Total	662	100%

Table 7 reveals the departments of the respondents in the study. Respondents from Accounting had larger respondents with (125, 18.9%), Administration (67, 10.1%), Economics (56, 8.5%), Management Accounting (58, 8.8%), Educational foundation (32, 4.8%), Computer Science (29, 4.4%), Political Science (24, 3.6%), Teacher Education (26, 3.9%), English Language (21, 3.2%) Arts (20, 3.0%), Science Education (24, 3.6%), Law (20, 3.0%), Entrepreneurship (21, 3.2%)

Table 6:

Distribution of Respondents by Academic Qualification

S/N	Qualification	Frequency	Percent %
1.	Bachelors' Degree	120	18.1
2.	Masters' Degree	257	38.8
3.	Ph.D.	285	43.1
	Total	662	100.0

Analysis of the result of level of education of the respondents is presented in Table 8, shows that Majority (285,43.1%) of respondents indicated that they had Ph.D., those with Masters' Degree were (257, 38.8%), 120 respondents (18.1%) claimed to have Bachelors' Degree.

Table 7:

Distribution of Respondents by Age Range

S/N	Age Range	Frequency	Percent %
1.	Below 40 years	357	53.9
2.	40-49 years	280	42.3
3.	50-59 years	25	3.8
4.	Total	662	100.0

Table 9 shows that Majority of Respondents (357, 53. 9%) were in the age range of below 40 years and respondents (280, 42.3%) are within age range of 40-49 years, and 25 respondents (3.8%) fell within age range of 50-59 years.

Table 8:

Distribution of Respondents by Gender

S/N	Gender	Frequency	Percent %
1.	Male	378	57.1
2.	Female	284	42.9
	Total	662	100.0

Table 10 shows that about (378, 57.1%) of respondents indicated that they were male while about 284 respondents (42.9%) indicated that they were female. This shows the dominance of males as academic staff over females in the surveyed ODLs.

Table 9:
Distribution of Respondents by Years of Teaching in the Universities

Year of teaching	Frequency	Percent %
10 to 11 years	145	25.8
12 to 13 years	108	19.2
14 to 15 years	98	17.4
16 to 17 years	99	17.6
18yrs and above	113	20.1
No indication	99	17.6
Total	662	100

Table 11 shows that the respondents who fell within 10-11 years are (145, 25.8%), 12-13 years (108, 19.2%), 14-15 years (98, 17.4%), 16-17 years (99, 17.6%), 18 years and above (113, 20.1%) and No indication (99, 17.6%)

Answer to Research Questions

Research Question 1: *What ICT facilities are available in open and distance learning (ODL)?*

To find out the available ICT facilities in ODL, frequency count, percentage and Mean were used. The derived result are shown in Table 10

Table 10:

Availability of ICT Facilities in ODL

S/N	Items	A	%	NA	%	Mean	Rank
1.	Computing infrastructures	378	57.1	284	42.9	1.43	11
2.	Application Software	367	55.4	295	44.6	1.45	15
3.	Internet Services Providers	447	67.5	215	32.5	1.32	7
4.	Security Infrastructures	436	65.8	226	34.1	1.34	8
5.	Learning Management Systems (LMS)	374	56.5	288	43.5	1.44	12
6.	Network Infrastructures	478	72.2	184	27.8	1.28	5
7.	Information Support Systems	534	80.7	128	19.3	1.19	2
8.	Internet facilities	543	82.0	119	18.0	1.18	1
9.	Multimedia Projector	515	77.8	147	22.2	1.22	4
10	Desktop/Laptop	523	79.0	139	21.0	1.21	3
11	Photocopier machines	466	70.4	196	29.6	1.30	6
12	Internet Bandwidth	406	61.3	256	38.7	1.39	10
13	E-Learning platform	410	61.9	252	38.1	1.38	9
14	Web technology	371	56.0	291	44.0	1.44	13
15	Digital/Analogue Television and radio	368	55.6	294	44.4	1.44	14

Analysis of the results indicate that availability of internet facilities; (543, 82%), information support system (534, 80.7%), Desktop/Laptop (523,79%), Multimedia projector(515, 77.8%), Network infrastructures (478, 72.2%), photocopier machines (466, 70.4%), Internet service providers (447, 67.5%), security infrastructures (436 65.8%), Internet Bandwidth (406, 61.3%), e-learning platform (410, 61.9%), computing infrastructures (378,57.1%), Application Software (367,55.4%), LMS (374,56.5%), Web

technology (371, 56%), Digital/ Analogue T.V. (368,55.6%). Base on this result it could be inferred that; ICT facilities are available in ODLs centers.

Research question 2: *What ICT facilities are accessible to lecturers in ODL?*

To find out the accessibility of ICT facilities in ODLs, frequency count, percentage and Mean were used. The derived result are shown in Table 11

Table 11:
Accessibility of ICT Facilities in ODL

S/N	Items	A	%	NA	%	Mean	Rank
1.	Internet access in Library's centers	449	67.8	213	32.2	1.32	4
2.	Internet access at the center	460	69.5	202	30.5	1.31	3
3.	Internet access in Personal office	496	74.9	166	25.1	1.25	1
4.	CD-ROM access in Library' centers	466	70.4	196	29.6	1.30	2
5.	Access to center network/internet	440	66.5	222	33.5	1.34	6
6.	Access to center network in personal office	356	53.8	306	46.2	1.46	9
7.	Access to Local Area Network (LAN) at the center	269	40.6	393	59.4	1.59	11
8.	Access to Local Area Network (LAN) in personal office	208	31.4	454	68.6	1.69	13
9.	Access to virtual/digital library in the center's library	259	39.1	403	60.9	1.61	12
10.	Access to virtual/digital library in the center	323	48.8	339	51.2	1.51	10
11	Access to functional mobile phone in the office	424	64.0	238	36.0	1.36	7
12	Access to multimedia projector at the center	422	63.7	240	36.3	1.36	8
13	Access to computer/ Laptop at the center	446	67.4	216	32.6	1.33	5

The views of the respondents to this question are depicted in Table11. Table11 shows that, majority of the respondents are of views that internet access in personal office (496, 74.9%), CD-ROM access in the library (466, 70.4%), internet access at the center (460, 69.5%), internet access in library' centers (449, 67.8%), access to computer/ laptop (446, 67.4%), multimedia projector (422, 63.7%), Mobile phone (424, 64%), are accessible. But in contrary, some respondents indicated that Local Area Network (LAN) (393, 59.4%),

digital library (403, 60.9%) are not accessible. Base of this result, it could be inferred that majority of ICT facilities are accessible to lecturers.

Research Question 3: *What is the extent of lecturer's utilization of ICT facilities in ODL?*

To ascertain the extent of lecturer's utilization of ICT facilities in ODL, frequency count, percentage and mean were used. The derived result were shown in Table 12

Table 12:

Utilization of ICT Facilities in ODL

S/N	Items	HU (%)	MU (%)	NU(%)	Mean	Rank
1.	Desktop/Laptop computer	467 (70.5)	177 (26.7)	18(2.7)	1.32	1
2.	Personal E-mail account	435 (65.7)	227 (34.3)	0 (0.0)	1.34	3
3.	Internet service	424 (64.0)	225 (34.0)	13(2.0)	1.38	4
4.	Printer	424 (64.0)	223 (33.7)	15(2.3)	1.38	5
5.	Digital projector/interactive whiteboard	413 (62.6)	221 (33.4)	28(4.2)	1.42	7
6.	Software application	428 (64.7)	218 (32.9)	16(2.4)	1.38	6
7.	Internet	467 (70.5)	171 (25.8)	24(3.6)	1.33	2
8.	CD-ROM	420 (63.4)	192 (29.0)	50(7 .6)	1.44	8
9.	E-Journals	364 (55.0)	176 (26.6)	122 (18.4)	1.63	10
10.	E-Book	376 (56.8)	169 (25.5)	117 (17.7)	1.61	9
11	Video recorder	346 (52.3)	197 (29.8)	119 (18.0)	1.66	12
12	Cell phones/ Fax	278 (42.0)	267 (40.3)	117 (17.7)	1.76	14
13	Interactive Radio	251 (37.9)	248 (37.5)	163 (24.0)	1.87	16
14	Digital/Analogue T.V	321 (48.5)	169 (25.5)	172 (26.0)	1.77	15
15	Teleconferencing/Audio Conferencing	358 (54.1)	179 (27.0)	125 (18.9)	1.65	11
16	Multimedia projector	308(46.5	262(39.6	92(13.9)	1.67	13

The result in table12 shows that Desktop/laptop receives (467, 70.5%); Internet (424, 70.5%), personnel e-mail account (435, 65.7%), printer (424, 64%), software application (428, 64.7%), interactive white board (413, 62.6%), CD-ROM (420, 63.6%), E-journal (364, 55%), E-books (376, 56.8%) video recorder (346, 52.3%) are highly utilized by the respondents, The under-utilized ICT facilities are; Fax machines (278, 42%), Interactive

radio (251, 37.9%), Digital/Analog T.V. (321, 48.5) as indicated by the respondents and the corresponding percentages. It could be inferred that majority of ICT facilities are highly utilized in ODL.

Research Question 4: *What are the institutional ICT policies and strategies that are geared towards effective utilization of ICT facilities*?

To establish the institutional ICT policies and strategies that are geared towards effective utilization of ICT facilities, frequency counts, percentage and mean were used. The derived results were shown in Table 13.

Table 13:

ICT Policies and Strategies in ODL

S/N	Items	SA (%)	A (%)	D (%)	SD (%)	Mean	Rank
1.	Provision of official computers to all academic staff in the center	243 (36.7)	198 (29.9)	137 (20.7)	84(12.7)	2.09	7
2.	Provision of capacity building on the use of computer/internet by academic staff	272 (41.1)	181 (27.3)	118 (17.8)	91(13.7)	2.04	4
3.	Provision of free access to internet by academic staff in their offices	274 (41.4)	164 (24.8)	87 (13.1)	137 (20.7)	2.13	8
4.	Provision of internet access in the center's library	285 (43.1)	149 (22.5)	133 (20.1)	95 (14.4)	2.06	5
5.	Regular subscription of ICT resources (electronic journal, online databases) in the center's Library	280 (42.3)	134 (20.2)	130 (19.6)	118 (17.8)	2.13	9
6.	Creation of awareness on access to internet/electronic resources in the centers	364 (55.0)	186 (28.1)	78 (11.8)	34 (5.1)	1.67	1
7.	User education on access and use of ICT resources in the centers	300 (45.3)	201 (30.4)	89 (13.4)	72 (10.9)	2.08	6
8.	Regular alert to academic staff on availability of relevant ICT resources in the centers	326 (49.2)	143 (21.6)	111 (16.8)	82 (12.4)	1.92	2
9.	Regular maintenance of ICT infrastructures in the centers	244 (36.9)	167 (25.2)	143 (21.6)	108 (16.3)	2.17	10
10.	Relevant policies to guide use of ICTs resources in the centers	199 (30.1)	192 (29.0)	179 (27.0)	92 (13.9)	2.25	11
11	Provision of internet connectivity and internet bandwidths	211 (31.9)	110 (16.6)	242 (36.6)	99 (15.0)	2.35	12
12	Training and retraining of academic staff on their competency in utilization of ICT resources	311 (47.0)	100 (15.1)	222 (33.5)	29 (4.4)	1.95	3

The study sought to establish institutional ICT policies/strategies that are put in place to promote availability, accessibility and utilization of ICT facilities for instructional delivery and research. The result in Table 13 shows that the respondents agreed with all the items

raised as indicated by the above table and the corresponding percentages. It implies that majority of academic staff agreed that institutional ICT policies/strategies were highly formulated and articulated in ODLs to enhance availability, accessibility and the utilization of ICT facilities .

Research Question 5: *What are the major factors that facilitate ICT utilization in ODL?*

To find out major factors that facilitate ICT facilities in ODL, the frequency counts, percentage and means were used. The derived result were shown in Table 14

Table 14:

Factors that Facilitate Lecturers' ICT Utilization in ODL

S/N	Items	G (%)	M (%)	R (%)	P(%)	Mean	Rank
1.	Communication among instructor and learner	252 (38.1)	202 30.5	162 (24.5)	46 (6.9)	2.00	4
2.	Enhancement for research	300 (45.3)	209 (31.6)	109 (16.5)	44 (6.6)	1.84	2
3.	Educational administration	221 (33.4)	237 (35.8)	164 (24.8)	40 (6.0)	2.03	5
4.	Instructional system	187 (28.2)	300 (45.3)	114 (17.2)	61 (9.2)	2.07	6
5.	Delivery of course material	137 (20.7)	341 (51.5)	104 (15.7)	80 (12.1)	2.19	7
6.	Online tutorials and counseling	165 (24.9)	418 (63.1)	69 (10.4)	10 (1.5)	1.89	3
7.	Library service	227 (34.3)	395 (59.7)	34 (5.1)	6 (0.9)	1.73	1

Some factors according to Table 14 were greatly facilitate lecturers' ICT utilization in ODL; like enhancement for research as indicated by (300, 45.3%) respondents; Communication among instructor and learners which was affirmed by (252, 38.1%), some factors according to the table were moderately facilitate lecturer' ICT utilization; like Online tutorial; indicated by (418, 63.1%), library services (395, 59.7%) Delivery of course materials (341, 51.5%) instructional system (300, 45.3%), educational administration (237, 35.8%) It could be inferred that there are major factors that facilitate lecturers' ICT utilization in ODL

Research Question 6: *What is the influence of ICT accessibility on instructional delivery and research in ODL?*

To ascertain the influence of ICT accessibility on instructional delivery and research in ODL, frequency count, percentage and mean were used. The derived result were shown in Table 15

Table 15:

Influence of ICT Accessibility on Instructional Delivery and Research

S/N	Items	SA (%)	A (%)	D (%)	SD (%)	Mean	Rank
1.	Access and use of ICT resources increases my research productivity	333 (50.3)	260 (39.3)	67 (10.1)	2(0.3)	1.60	2
2.	Access and use of ICT resources improve the quality of my research	237 (35.8)	288 (43.5)	131 (19.8)	6(0.9)	1.86	6
3.	Access and use of ICT resources improve effectiveness and efficiency in teaching	291 (44.0)	226 (34.1)	143 (21.6)	2(0.3)	1.78	3
4.	Access use of ICT enhances my academic productivity	248 (37.5)	292 (44.1)	108 (16.3)	14 (2.1)	1.83	5
5.	Access to ICT resources is a requisite for relevant research system	268 (40.5)	264 (39.9)	111 (16.8)	19 (2.9)	1.82	4
6.	Internet is a worthwhile tool for scholarly research	233 (35.2)	287 (43.4)	136 (20.5)	6(0.9)	1.87	7
7.	ICT resources facilitate higher productivity	347 (52.4)	287 (36.0)	74 (11.2)	3 (0.5)	1.60	1

Table 15 reveals the influence of ICT accessibility on instructional delivery and research. The result in table 15 shows that Majority of respondents overwhelmingly agreed that ICT accessibility has positively influenced instructional delivery and research in ODL, as indicated by the number of respondents and the corresponding percentages. Base of this result, It could be inferred that ICT accessibility has positive influence on the instructional delivery and research activities in ODL.

Research Question 7: *What is the influence of the demographic variables (age, gender, academic qualification and discipline) on ICT resources utilization?*

To find out the influence of the demographic variables (age, gender, academic qualification and discipline on ICT resources utilization, Regression analysis and Regression coefficients were used. The derived result were shown in Table16 and 17

Table16:
Summary of Regression Analysis of the Combined Prediction of Age, Gender, Academic qualification and Discipline on ICT Resources Utilization

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.326	0.107	0.101	5.820

	Sum of	Df	Mean Square	F	Sig	Remark
Regression	2654.501	4	663.625			
Residual	22250.842	657	33.867	19.595	0.000	Sig.
Total	24905.343	661				

Table 16 shows that the demographic variables (age, gender, educational qualification and discipline) have influenced ICT resources utilizations among lecturers. That is ICT resources utilization have correlation with the independent variables. The table also shows a coefficient of multiple correlations (R) of 0.326 and a multiple R square of 0.107. This means that 10.1% (Adj. $R^2 = 0.101$) of the variance on the ICT resources utilizations is accounted for by the independent variables, when taken together. The significance of the composite contribution was tested at $p<0.05$ using the F- ratio at the degree of freedom (df- 4/657). The table also showed that the analysis of variance for the regression yielded a F-ratio of 19.595, therefore, there was a significant joint influence of demographic variables (age, gender, academic qualification and discipline) on

ICT resources utilizations among academic staff of universities. The above result is significant at 0.05 level.

Table 17:

Relative Contribution of the Independent Variables to the Dependent Variables (Test of Significance of the Regression Coefficients)

Variable	Unstandardized		Standardized			
Model	(B)	Std. Error	Beta	T	P.	Remark
Constant(Utilization of ICT facilities	20.230	1.127	-	17.951	.000	-
Age	0.040	.402	.004	.099	.921	Not Sig.
Gender	1.269	.458	.102	2.771	.006	Sig.
Academic Qualification	1.569	.307	.185	4.968	.000	Sig.
Discipline	.243	.036	.248	6.675	.000	Sig.

Table 17 reveals that relative contribution of the four independent variables on the dependent variable, expressed as beta weights. There is a relative effect of discipline on Utilization of ICT facilities ($\beta = .248$, $p < .05$), relative significant joint existed. There is a relative effect of Academic Qualification on Utilization of ICT facilities ($\beta = .185$, $p < .05$), relative significant joint existed. There is a relative effect of gender on Utilization of ICT facilities ($\beta = .102$, $p < .05$), relative significant joint existed. There is no relative effect of age on utilization of ICT facilities ($\beta = .004$, $p > .05$), no relative significant joint existed. Base on this result, it implies that there was a relative influence of the demographic variables (gender, academic qualification and discipline) on ICT resources Utilization.

Research Question 8: *What are the factors hindering the effective utilization of ICT facilities in ODL*?

To find out the major factors that hinder the availability, accessibility and utilization of ICT facilities, the frequency count, percentage and mean were used. The derived result were shown in Table 18

Table 18:

The Factors Hindering the Effective Utilization of ICT Facilities in ODL

S/N	Items	SA (%)	A (%)	D (%)	SD (%)	Mean	Rank
1.	Poor internet connectivity	255 (38.5)	247 (37.3)	144 (21.8)	16 (2.4)	1.88	10
2.	Financial problem	268 (40.5)	203 (30.7)	183 (27.6)	8(1.2)	1.90	11
3.	Poor electricity supply	302 (45.6)	234 (35.3)	116 (17.5)	10 (1.5)	1.75	1
4.	Insufficient skill	251 (37.9)	260 (39.3)	135 (20.4)	16 (2.4)	1.87	8
5.	Poor training program	237 (35.8)	235 (35.5)	158 (23.9)	32 (4.8)	1.98	15
6	Excessive academic workload	271 (40.9)	248 (37.5)	137 (20.7)	6(0.9)	1.82	5
7.	Insufficient funding	301 (45.5)	227 (34.3)	119 (18.0)	15 (2.3)	1.77	3
8.	Poor ICT policy/strategies	300 (45.3)	189 (28.5)	150 (22.7)	23 (3.5)	1.84	6
9.	Poor economic situation	310 (46.8)	223 (33.7)	111 16.8)	18 (2.7)	1.75	2
10.	Organization, Social and cultural problems	256 (38.7)	303 (45.8)	100 (15.1)	3 (0.5)	1.77	4
11	There is no long term staff development to support the integration of technology into instruction	183 (27.6)	312 (47.1)	164 (24.8)	3(0.5)	1.98	14
12	The hardware available was grossly insufficient to accommodate ICT supported teaching	208 (31.4)	335 (50.6)	107 (16.2)	12 (1.8)	1.88	9
13	The software available was grossly inadequate to accommodate ICT supported teaching	194 (29.3)	387 (58.5)	62 (9.4)	19 (2.9)	1.86	7
14	The hardware available had already out dated to accommodate ICT supported teaching	199 (30.1)	343 (51.8)	95 (14.4)	25 (3.8)	1.92	12
15	No Initiation of program (such as seminar and workshop) to encourage ICT supported teaching	198 (29.9)	321 (48.5)	118 (17.8)	25 (3.8)	1.95	13
16	The software available had already out dated	163 (24.6)	297 (44.9)	170 (25.7)	32 (4.8)	2.11	16

Table 18 reveals the major factors that hinder ICT availability, accessibility and utilization of ICT facilities. The result indicates that majority of respondents agreed that there were many hindrances to ICT facilities; availability, accessibility and utilization as indicated by

respondents; poor internet connectivity (502, 75.8%), financial problem (471, 71.2%), poor electricity (636, 80.9%), poor training program (526, 71.3%), excessive academic workload, (519, 78.4%), insufficient funding (528, 79.8%), poor ICT policy/strategies (489, 73.8%), poor economic system (533, 80.5%), organization, social and cultural problem (559, 84.5%), there is no long term staff development (495, 74.7%), hardware was grossly insufficient (54, 8.2%), software was grossly insufficient (581, 89.8%), Hardware has already obsolete and out dated (542, 81.9%), no initiation of any programme such as seminar (519, 78.4%), Software available was already out dated (460, 69.5%).Base on this result, It could be inferred that majority of academic staff agreed that there were major factors that hinder ICT availability, accessibility and utilization.

Hypotheses Testing

Based on research questions 1-8 research hypotheses 1-4 were developed. The results related to hypotheses one to four formulated for the study in chapter one are as shown in subsequent tables. All hypotheses were tested at 0.05 level of significance.

Hypothesis One

Ho_1: *There is no significant difference in the availability of ICT facilities based on University type.*

To test for the availability of ICT facilities based on university type, ANOVA was used. The result derived from the analysis are shown in table 19

Table 19:

ANOVA on Availability of ICT Facilities Based on University Type

University Type	N	Mean	Std D	Source	Sum of square	Df	Mean square	F	Sig	Remark
CDL University of Ibadan	144	19.06	2.178							
NOUN	154	20.45	2.876							
(CDL)OAUIFE	144	20.11	2.712	Between groups	186.019	4	46.505	5.994	0.000	Significant
DLI UNILAG	110	20.41	2.488							p <0.05
ODL Centre, LAUTECH Ogbomosho	110	20.26	3.616							
				Within groups	5096.960	657	7.758			
Total	662				5282.979	661				

The result of the ANOVA shows there was a significant difference in the availability of ICT facilities based on University type. The F (df 4,657) = 5.994, P=0.00 < 0.05), indicated a statistically significant difference(less than 0.05). Therefore, it can be concluded that there was a significant difference in the availability of ICT facilities based on University type the above result is significant at 0.05 level, therefore, the null hypotheses is rejected.

Hypothesis Two

Ho_2: *There is no significant difference in the lecturers' access to ICT facilities based on university type.*

To test for lecturers' access to ICT facilities, based on university type, ANOVA was used. The result derived from the analysis are shown in table 20

Table 20:

ANOVA on Access to ICT Facilities Based on University Type

University type	N	Mean	Standard deviation	Source	Sum of square	Df	Mean square	F	Sig	Remark
CDL, University of Ibadan	144	18.43	3.635							
NOUN	154	17.44	2.672							
CDL, OAU Ife	144	19.85	4.432	BTW GROUP	968.722	4	242.180	20.063	0.000	Significant
DLI, UNILAG	110	19.68	3.599	WITHIN		657				P<0.05
ODL Centre, LAUTECH Ogbomosho	110	16.64	2.583	GROUP						
Total	662	18.43	3.669		8899.257	661				

The result of the ANOVA shows there was a significant difference in the accessibility of ICT facilities based on university type. The F (df 4,657) = 20.063, P=0.00 < 0.05), indicated a statistically significant difference (less than 0.05). Therefore, it can be concluded that there was a significant difference in the accessibility of ICT facilities based on University type the above result is significant at 0.05 level, therefore, the null hypothesis is rejected.

Hypothesis Three

H_{03}: *There is no significant difference in the extent of lecturer's utilization of ICT facilities based on university type*

To test for the extent of lecturers' utilization of ICT facilities based on university type, ANOVA was used. The results derived from the analysis are shown in table 21

Table 21:

ANOVA on Extent of Lecturers' Utilization of ICT Facilities Based on University Type

University type	N	Mean	Standard deviation	Source	Sum of square	Df	Mean square	F	Sig	Remark
CDL University of Ibadan	144	21.08	2.978							Significant
NOUN	154	26.49	7.125		2833.690	4	708.422			
				BTW Group				21.087	0.000	P<0.05
CDL, OAU, Ife	144	24.60	5.951							
DLI, UNILAG	110	26.73	6.696							
ODL Centre LAUTECH, Ogbomosho	110	24.58	5.311	Within Group						
					22071.655	657	33.595			
Total	662	24.62	6.138		2495.343	661				

The result of the ANOVA shows that there was a significant difference in the utilization of ICT facilities based on university type. F (df 4,657) = 21.087, P=0.00 < 0.05), indicated a statistically significant difference (less than 0.05). Therefore, it can be concluded that there was a significant difference in the utilization of ICT facilities based on university type the above result is significant at 0.05 level, therefore, the null hypotheses is rejected

Hypothesis Four

Ho_4: There is no significant difference in the ICT policies and strategies framework based on university type.

To test for the ICT policies and strategies based on university type, ANOVA was used. The result derived from the analysis is shown in table 22

Table 22:

ANOVA on the ICT Policies and Strategies Framework Based on University Type

University type	N	Mean	S.D	Source	Sum of square	Df	Mean square	F	Sig.	Remark
CDL University of Ibadan	144	23.93	3.971							Significant
(NOUN)	154	25.02	6.048							
CDL OAU Ife	144	25.76	8.573	BTW Group	590.271	4	147.569	3.192	0.013	P<0.05
DLI UNILAG	110	26.05	7.326							
ODL LAUTECH Ogbomosho	110	23.55	7.516							
				Within Group	30369.065	657	46.224			
Total	662		6.844		30959.341	661				

The result of the ANOVA shows that there was a significant difference in the formulation of ICT policies and strategies based on university type. F (df 4,657) = 3.192, P=0.013 < 0.05), indicated a statistically significant difference (less than 0.05). Therefore, it can be concluded that there was a significant difference in the formulation of ICT policies and strategies based on university type. The above result is significant at 0.05 level, therefore, the null hypothesis is rejected.

Summary of major Findings:

The findings of this study based on the research questions and the hypotheses tested are summarized as follows:

1. ICT facilities were available in ODL centers
2. Majority of ICT facilities were accessible to lecturers.
3. Majority of ICT facilities were highly utilized by lecturers

4. Lecturers agreed that ICT policies and strategies were highly formulated by university management in ODL.
5. Lecturers were unanimously agreed that there were major factors that facilitate ICT utilization in ODL.
6. Lecturers agreed that ICT accessibility positively influenced instructional delivery and research in ODL.
7. There was relative influence of demographic variables; (gender, academic qualification and discipline) on the ICT utilization in ODL, except age.
8. Lecturers agreed that there were major factors that hinder the effective utilization of ICT in ODL.
9. There was a significant difference in the availability of ICT facilities based on university type.
10. There was a significant difference in the lecturers' access to ICT facilities based on university type.
11. There was a significant difference in the extent of lecturers' utilization of ICT facilities based on the university type.
12. There was a significant difference on the formulation of ICT policies and strategies based on the university type.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the discussion of the findings, conclusions drawn from the findings and recommendations, limitation of the study and suggestions for further study. The research findings are sequentially discussed and interpreted in line with purpose of research, research questions and the hypotheses.

Discussions of Research Findings

Findings on Availability of ICT Facilities in ODL

The finding of availability of ICT facilities was examined using research question 1 shows that ICT facilities were available in ODL; such ICT facilities include; Computing infrastructures, Application Software, Internet Service Providers, Security Infrastructures, Learning Management Systems (LMS), Network infrastructures, Information Support Systems, Internet Facility , Multimedia Projector, Notebooks, Photocopier machine, Internet bandwidth, E-learning platform, Web technology, Digital/Analogue T.V. and radio.

This finding corroborates with the result of Murali (2000)[128] who stated that the following ICT facilities were available in ODL; Network infrastructures, Computing infrastructures, System and application software, Internet service provider, Bandwidth and Security infrastructures. Also the results is in tandem with the finding of Rao (2009)[131] who highlighted the availability of ICT facilities in ODL, such as; Network infrastructures, Application software, Computing infrastructures, System and application software, Internet Service Provider, Bandwidth and Security infrastructures. The availability of ICT in ODL was as

a result of NUC routine inspections of ICT facilities in ODL centers to ensure that the system is in tandem with world best practices in ODL worldwide according to respondents' comment. Some respondents are of view that accreditation of ODL by NUC is subjected to availability of ICT facilities.

By implication, since the ICT facilities were available in ODL, instructional delivery and research will go on smoothly without any hindrances. Nigeria ODL system will be in line with what is going on in ODL institutions globally. In order words, availability of ICT facilities is imperative for effectiveness and efficiency in access and use of ICT in ODL.

Findings on Accessibility of ICT Facilities in ODL

Based on the frequency count, percentage and mean value of the result on accessibility of ICT facilities as presented in Table 13, the result revealed that; Majority of ICT facilities were accessible to lecturers for example internet access in the centers' library, CD-ROM access, Network access, access to functional mobile phone, access to multimedia projectors, access to computer and laptop among others.

This finding agreed with that of Ani and Esin (2003)[118] who studied the ICT accessibility in five federal universities in Nigeria, it was found that lecturers have relative access to computer, access to networking. In the same vein, Emojorho and Adomi (2006)[122] surveyed access to ICT in Delta state university, Nigeria. The findings of the study showed that 72.5% of the lecturers reportedly have ICT facilities including internet access at their offices. Similarly, a recent study by Nwezeh (2010)[129] showed a high state of ICT facilities in Obafemi Awolowo University Ile Ife. The findings of the survey indicated that 95.7% of the lecturers have computers in their offices.

It is also emphasized in the table that some ICTs were inaccessible for instance Local Area Network (LAN) at centre, access to virtual/digital library. It could be deduced based on this findings that majority of ICT facilities were accessible to lecturers while some facilities were Inaccessible. The inaccessibility of the ICT facilities might be as a result of unavailability. Therefore looking at the significance of the ICT facilities in ODL, the management should make concerted effort to ensure that the facilities are accessible to lecturers. Hence, accessibility of ICT in ODL is facilitated by a good ICT environment which is characterized by availability of ICT facilities. Access to ICT particularly the internet will help the lecturer to effectively conduct the research work and academic assignment.

Findings on the Extent of lecturers Utilization of ICT Facilities in ODL

The extent of lecturer utilization of ICT facilities in ODL was examined by research question 3 and presented in table 14 showed that majority of ICT facilities were highly utilized for example; Desktop/ Laptop computer, E-mail account, internet service, printer, digital projector, software application, and internet, CD-ROM, E-journal, E-book and video recorder.

These findings corroborate the findings of Ani and Esin (2003)[118] who revealed extensive use of ICT facilities by lecturers in Nigeria universities. In the same vein, Azubogu and Madu (2007)[119] did a survey that explored the use of ICTs among the teaching staff of Imo State University, Nigeria; the result indicated high usage of ICT facilities. Likewise the findings of Ajala (2010)[116] revealed that vast majority of respondents were using the internet regularly in teaching and research. Moreover Egberongbe (2010)[121] finding was in tandem with this finding. She surveyed the use of ICT resources by lecturers at the University of Lagos, Nigeria. It was found that 90.6% of the respondents accessed and use e-journal.

The result also identified some underutilized ICT facilities like fax machine, Digital/Analogue Television Set. This result agreed with the finding of Ehikhamenor (2003)[121] who asserted that some ICT facilities were underutilized by university lecturers. The implication of this result as regard the high utilization of ICT facilities by the lecturers might be the provision made by the management to procure relevant ICT facilities and training and retraining programme enjoyed by the lecturers.

The management of ODL will keep this trend by ensuring that relevant ICT facilities were procured for their optimal utilization, effectiveness and efficiency. ODL cannot be guaranteed without the effective utilization of ICT facilities. On some underutilized ICT facilities in ODL, the management should make an effort to procure these facilities to enhance optimal utilization.

Findings on the Institutional ICT Policies and Strategies in ODL

The institutional ICT policies and strategies were examined by research question 4 and presented in table15 revealed that majority of lecturers agreed that ICT policies were highly articulated and formulated in ODL. This finding is in conformity with the result of Ingersoll and Culshaw (2004)[123] who found that ICT policies were highly leveraged upon, and these have helped the universities to ensure effective and equitable distribution of ICT facilities for research activities. Also, this result is in conformity with Riahinia and Zandian (2008)[131] who advocated the imperative of formulating of relevant ICT policy towards promotion of effective access and use of ICT facilities. It could be inferred base of these findings that ODL in South-west, Nigeria, is ready for ODL system of education because a well formulated ICT policies in ODL will tackle inequality on the utilization of ICT facilities.

Findings on the Major Factors that FacilitateLecturers' ICT Utilization in ODL

The major factors that facilitate ICT utilization in ODL was examined by research question five, and presented in table 16 revealed that some lecturers agreed that some factors greatly facilitate ICT utilization in ODL such as communication among instructor and learners, enhancement for research activities, while other lecturers agreed that some factors moderately facilitate ICT utilization such as Online tutorial and counseling, Delivery of course materials and educational administration. These results corroborate with TOUT (2015)[133] who asserted that ICTs facilitate research, instructional system, and educational administration among others. It could be inferred that there are major factors that facilitate ICT utilization in ODL.

Findings on the Influence of ICT Accessibility on Instructional Delivery and Research in ODL

The influence of ICT accessibility on instructional delivery and research in ODL was examined by research question six, and presented in table 17 showed that the lecturers agreed that ICT accessibility positively influenced instructional delivery and research in ODL.

This finding was in conformity with the finding of Dulle (2005)[121] whose results established that ICT facilities are worthwhile tools for scholarly research. Dulle (2005)[121] posited that Obafemi Awolowo University Lecturers perceived that, access to internet is a useful tool for their research activities. A similar finding was obtained by Ajala (2010)[116] where most academics in Ladoke Akintola university of Technology in Nigeria perceived the internet as impacting positively on their research work. Moreover, Ehikhamenor (2003)[121] agreed with the finding of the result by revealing that access and use of electronic journals has been positively associated with scientific productivity. The result of the present study consistently agrees with the provisions of TAM and UTAUT that perceived usefulness or performance expectancy of ICT

will lead to their access and use with expected positive perceive effect on instructional delivery and research.

It can therefore be established that ICT accessibility positively influenced instructional delivery and research in ODL. ICT accessibility could not be ruled out for effective instructional delivery and research activities in ODL. Access to ICT facilities particularly the internet will help academic staff in ODL institutions towards effective integration into global research community.

Findings on the Influence of the Demographic Variables on ICT Facilities Utilization

The influence of demographic variables on the utilization of ICT facility was examine by research question seven and presented in table 18 showed that there were relative effects of the demographic variables on ICT utilization in ODLs, except age that has no relative effect on ICT utilization. The finding of this study corroborates the finding of Dulta-Berman (2002)[121] in a study of demographic correlates on internet use confirmed that, the males are most likely to use the internet than females. Likewise Dulle (2010)[121] pointed out that gender difference has affected the rate of adoption of ICT in developing countries. In a similar vein Rhima (2011)[131] viewed that if the existing gender imbalance in the use of ICTs is not tackled, it will impede the productive capacity of women.

On the relative effect of the discipline on ICT use, this finding is in line with the finding of Ehikhamenor (2003)[121] who found that there was difference in the use of ICT facilities across discipline in Nigeria universities. On the relative effect of Academic Qualification on ICT utilization, this finding agreed with the finding of UNDP (2011)[133] who stated that demographic factors that are often cited as having an influence on ICT use are gender, income, academic qualification and age. Likewise Olatokun (2009)[130] emphasized that academic qualification had

the strongest influence on the ICT as most of the people that use ICT are mainly educated people.

On the relative effect of age on ICT utilization, this findings is at variance with the result of Gamaje and Halpin (2007)[122] in a survey of the use of ICTs found that most of the ICT users are the youths and adults who are below the age of 35 years and the most active group of ICT users are aged 12-25yrs.

The findings of this study established that there was an influence of the demographic variables on the utilization of ICT, except Age. Therefore demographic variables should be considered as a major predictor in the utilization of ICT facilities, and these effects need to be bridged.

Findings on the Factors Hindering the Effective Utilization of ICT Facilities

The major factors that hinder the effective utilization of ICT facilities was examined by research question eight and presented in table 20 showed that the lecturers agreed that there were many factors hindering the utilization of ICT; like poor internet connectivity, financial problem, poor electricity supply, insufficient skill, poor training programme among others.

This finding is in conformity with the finding of Yusuf (2006)[135] who opined that several cities and rural areas in Nigeria are yet to have or having fluctuation in the supply of electricity. In the same vein, Igwe (2005)[123] Nwagwu and Ananike (2006)[129] asserted that there is shortage and high cost of equipments software and hardware compared to situations in industrialized nations. In the same vein Ololube (2006)[130] enumerate the challenges of ODL such as : poor funding, poor power supply, lack of skills by lecturers in designing course wares, poverty and poor ICT access, internet connectivity, Low teledensity and technophobia among others. Moreover, Ifinedo and Ololube (2007)[130] stated the challenges of ODL in Nigeria, such as; lack

of electricity to power ICTs materials, poor telecommunication facilities, and poor postal system. Above all, lack of access to the needed infrastructures due to insufficient funds.

The result established that there were factors hindering the effective utilization of ICT facilities, effort should be made to ensure that these problems are addressed by relevant authority to forestall total breakdown of ODL system in Nigeria.

Findings on the Availability of ICT Facilities based on University Type

The availability of ICT facilities based on university type was examined by hypothesis 1 and presented in table 21 revealed that there was a significant difference in the availability of ICT facility based on university type. The results of ANOVA established a significant difference among the universities surveyed.

The findings of the study is in line with Tahir (2010)[133] whose finding established significant difference between university of Calabar and university of Ibadan in term of availability and accessibility of ICT facilities. This implies that the latter invested much more resources on adoption of ICT facilities than other. In the same vein, Harry (2014)[123] corroborates that there was significant difference in the mean ratings of lecturers in federal, state and private universities on the extent of availability of ICT resources. Also, Obadara (2012)[129] revealed that there was significant difference in availability of ICT resources between private and public universities.

The result revealed that NOUN, and DLI are comparatively better than other ODLs in term of availability of ICT facilities looking at their mean value. It implied that NOUN and DLI invested more on ICT resources than other ODLs.

Findings on the Accessibility of ICT Facilities based on University Type

The accessibility of ICT facilities based on the university type was examined by research hypothesis two and presented in table 22 shows that the result of the ANOVA established a significant difference among the ODL surveyed.

The finding of the study is in agreement with Tahir, Mahmood and Shafique (2010)[133] whose finding established a significant difference in ICT accessibility between University of Ibadan and University of Calabar. In the same vein, a comparative study conducted by Lawal and Olumuyiwa (2017)[126] revealed that there was a significant difference between public and private universities in the access to and utilization of ICT resources.

This study revealed that CDL, Ife and DLI, UNILAG are comparatively better than others in term of accessibility of ICT facilities.

Findings on the Extent of ICT Utilization based on University Type

The extent of ICT utilization based on university type was examined by research hypothesis three and presented in table 23 shows that the result of ANOVA established a significant difference in the extent of ICT utilization among ODL surveyed. This result is in line with Obadara (2012)[129] findings which revealed that there was significant difference on ICT utilization between private and public universities. Moreover, A comparative study conducted by Lawal and Olumuyiwa (2017)[126] revealed that there was a significant difference between public and private universities in the access to and utilization of ICT resources.

The result established that DLI, UNILAG and NOUN take a lead in the utilization of ICT facilities considering their mean value. This implied that; they invested much more resources on adoption of ICT facilities than other ODLs.

Findings on the ICT Policies and Strategies Framework based on University Type

The ICT policies and strategies framework based on university was examined by research hypothesis four and presented in table 24. It shows that the result of ANOVA established a significant difference in ICT policies and strategies based on university type.

The result established that DLI, UNILAG, CDL, Ife, and NOUN articulated more ICT policies than other ODLs. The implication of these results established a gap on the ICT availability, accessibility, utilization and formulation of ICT policies among surveyed ODL in South-west.

Implication of the Findings

Based on the findings of the study, the following implications can be drawn:

The findings have implication on the instructional delivery and research in ODL. It is an indication that with availability of ICT facility in ODL, the lecturer will be enriched with robust information which will be useful for teaching and research system. Availability of ICT facilities will enhance interaction between lecturers and students. It is basis for distributing information and facilitating communication between lecturers and students as in video-conferencing, audio-conferencing and e-mail. The availability and accessibility of ICT will be useful for lecturers to present resources, assess and monitor knowledge, to enhance administrative work, as learning content in relationship to students' information.

Accessibility and utilization of ICT in ODL will enhance academic productivity among the lecturers; it will improve effectiveness and efficiency in teaching. Accessibility and utilization of ICT facility will facilitate information; enhance a quality academic work as well as a tool for successful instructional delivery. Accessibility and utilization of ICT will afford lecturers and students to have equitable access to ICT facilities in ODL.

Formulation of relevant ICT policy and strategies will enhance effective accessibility and utilization of ICT facility. A well articulated ICT policy is desirable to curb menace of digital divide, and promote integration and adoption of ICT as well as access and use of ICT facility.

The result of the study also showed that there are a relative effect of demographic variables on the utilization of ICT facilities; the implication of this on the study is that the effect can cause a serious inequality among lecturers if remain unaddressed. The study also revealed that there are major hindrances on the availability, accessibility and the utilization of ICT. The

implication of these hindrances on ICTs is that it can jeopardize effective and smooth running of ODL system in the country if remained unaddressed.

Moreover, the study established that there are significant differences in availability, accessibility, utilization and ICT policy and strategy among ODLs in South-west, Nigeria. The implication of this variation is that while some lecturers in ODL institutions are adequately equipped with relevant ICT facilities, others may experience inefficiency on the availability, accessibility and utilization of ICT. This may eventually affect their quality of instruction delivery and research.

Conclusions

This study explored the ICT utilization for ODL in universities in South-west Nigeria. The result obtained from data gathered and analyzed in this study indicates that ICT facilities were available in ODL. It also revealed that majority of ICT facilities were accessible.

The findings of this study also established that majority of ICT facilities were highly utilized. The result also indicated that institutional ICT policies and strategy were highly articulated and formulated by the management. The result also indicated that there are some factors that facilitate ICT utilization in ODL.

Moreover, the result also affirmed that ICT accessibility positively influenced instructional delivery and research in ODL. The result also established that there was a relative influence of the demographic variables on the utilization of ICT. The result also indicated that there were major factors that hinder the availability, accessibility and utilization of ICT facility in ODL.

Furthermore, the study affirmed that there was significant difference in the availability of ICT facility based on University type. The study also revealed that there was significant difference in the accessibility of ICT facility based on University type. The study also revealed that there was significant difference in the extent of utilization of ICT facilities based on university type. The study also revealed that there was significant difference in ICT policies and strategies framework base on University type.

Limitations of the Study

The study has the following limitations:

1. The study was designed to focus on ICT utilization in ODL in universities in South-west, Nigeria. The respondents were restricted to all accredited ODL institutions in South-west, Nigeria. The findings may not be generalized to other ODL institutions in Nigeria.
2. The study was limited to lecturers as the respondents, excluding the students' involvement in the study.
3. The instrument failed to include some variables which could have made entire study to be more robust, but to avoid over extension of the instrument.
4. The study was restricted to ODL lecturers only, excluding the conventional lecturers.
5. The sample of the study was so small due to the characteristic of the study.

But despite these limitations, the findings of this study were to be significant, valid and useful, most especially in the area of instructional delivery and research in ODL.

Recommendations

Based on the findings and conclusions of this study, the following recommendations were made:

1. The university managements at the surveyed ODLs should endeavor to procure some modern ICT facilities to enhance effectiveness and efficiency.
2. The management should make some ICT facilities accessible to lecturers like virtual/digital libraries and LAN in line with global trend in order to promote accessibility and utilization of ICT resources by lecturers.
3. The underutilized ICT facilities should be given priority. It is also recommended that equitable training on information literacy should be provided to lecturers to enhance their utilization of ICT.
4. The management should continue to embark on drastic formulation of relevant institutional ICT policies and strategies in line with acceptable world best practices of ODL globally. This will not only enhance sustainability, but enhance effectiveness and efficiency in ODL centers.
5. The management should endeavor to adhere to some factors which are very sacrosanct to the development of ODL like; delivery of course materials, online tutorial and counseling services, instructional system and library services.
6. University management at the surveyed ODLs should massively increase their investment on ICT facilities to sustain this trend. University management should partner with other stakeholders towards the provision of enabling ICT environments for lecturers to support the instructional delivery and research in ODL.
7. The university management should bridge gaps across all the demographic variables, in term of equitable access; this will encourage and promote access and use of e-resources by all categories of lecturers in surveyed ODL. Hence, equitable access to ICT facilities should be provided to all lecturers. For example if the facility is provided to all lecturers

irrespective of age, gender, qualifications and discipline, it will encourage and promote the accessibility and utilization of ICT.

8. The ODL management should endeavor to address these problems of poor internet connectivity, financial problem, poor electricity supply, insufficient skill, excessive academic workload. The management should provide enough software and hardware, organize seminar for lecturers, to enhance effectiveness and efficiency in ODL.
9. The N.U.C should ensure that it bridges the gaps of availability, accessibility, utilization and ICT policies and strategies among ODLs. The N.U.C will address the variation by recommending to the federal government among other things; adequate funding, resuscitation of ODL system in the country and provision of adequate hardware and software to enhance equitable access to ICT facilities among lecturers.

Suggestion for Further Studies

For further research in this area, the following were suggested

1. The study should be extended to other geo-political zones in accredited ODLs in Nigeria;
2. Further studies can also focus on students as sample in ODL institutions in Nigeria, to ascertain their view on the subject matter.
3. Some other variables; such as lecturers and students self-efficacy on the utilization of ICT facilities, the degree of availability and accessibility could be looked into.
4. Future study can look at if there is significant difference between student and lecturer perception on availability, accessibility and utilization of ICT facility in ODL.

5. The study can be revisited at least three year interval to ascertain the level of ICT facilities available in ODLs.
6. Experimental studies can be conducted on student utilization of ICT facility in ODL

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APPENDICES

APPENDIX I
FACULTY OF EDUCATION

DEPARTMENT OF EDUCATIONAL TECHNOLOGY

UNIVERSITY OF ILORIN, NIGERIA

Questionnaire on the Information and Communication Technology Utilization for Open and Distance Learning in Universities in South-west Nigeria

Dear Sir/Madam,

I am a doctoral student in the Department of Educational Technology, Faculty of Education, University of Ilorin, Nigeria. This work is part of the requirements for the award of the Doctor of Philosophy of the university. The title of my work is Information and Communication Technology Utilization for Open and Distance Learning in Universities in South-west Nigeria. Hence, I am pleased to request you to voluntarily complete this questionnaire as appropriate and be assured that all responses would be treated in confidence and use only for the purpose of the research.

Thanking you for your cooperation

AbdulAzeez, M. A.

SECTION: 1

Respondents' Demographic Characteristics

1. Name of your University----------

   Name of your Faculty ----------

   Name of your Department----------

   Area of Specialization----------

2. Academic Qualification: (Highest Level of Education) (a) Bachelors Degree ( ) (b) Masters Degree ( ) (c) Ph.D. ( ) (d) others (please specify) ----------
3. Age: (Tick) ( ) one only) (a) below 40 ( ) (b) 40-49 ( ) (c) 50-59 ( ) (d) 60 and above ( )
4. Gender: (a) Male ( ) (b) Female ( )
5. How long have you been teaching in the university? ----------

   1-5 ( ) 5-10 ( ) (b) 10-15 ( ) (c) 15-20 ( ) (d) 20 and above ( )

SECTION 11 (A)

Availability of ICT Facilities (AICTF)

Please tick as appropriate which of these ICT Facilities are available by you in your center to support teaching and research **activities?**

S/N	ICT Infrastructure	Available	Not Available
1.	Computing Infrastructures		
2.	Application Software		
3.	Internet Service Providers		
4.	Security Infrastructures		
5.	Learning Management Systems (LMS)		
6.	Network Infrastructures		
7.	Information Support Systems		
8.	Internet facilities		
9.	Multimedia Projector		
10.	Desktop/ laptop		
11.	Photocopier machines		
12.	Internet Bandwidth		
13.	e-Learning platform		
14.	Web technology		
15.	Digital/Analogue Television and radio		

SECTION B

Accessibility of ICT Facilities (AICTF)

Please tick as applicable which of these ICT Facilities are accessible to you in your center to support teaching and research activities?

S/N	Items	Accessible	Not Accessible
1	Internet access in centers' Library		
2	Internet access at the center		
3	Internet access in personal office		
4	CD-ROM access in centers' Library		
5	Access to center network/internet		
6	Access to center network in personal office		
7	Access to Local Area Network (LAN) at the center		
8	Access to Local Area Network (LAN) in personal office		
9	Access to virtual/digital library in the center's library		
10	Access to virtual/digital library in personal office		
11	Access to functional mobile phone in the office		
12	Access to multimedia projector in the center		
13	Access to computer and Laptop at the center		

SECTION C

Utilization of ICT Facilities (UICTF)

How would you rate the utilization of ICT Facilities in teaching and research at your center?

		Rating of the Utilization of ICT		
S/N	**ICT Infrastructures**	**Highly Utilized**	**Moderately Utilized**	**Not Utilized**
1.	Desktop/laptop computer			
2.	Personal E-mail account			
3.	Internet service			
4.	Printer			
5.	Digital projector/interactive whiteboard			
6.	Software application			
7.	Internet			
8.	CD-ROM			
9.	E-Journal			
10.	E-Book			
11.	Video recorder			
12.	Cell phones and Fax			
13.	Interactive Radio			
14.	Digital/Analogue T.V			
15.	Teleconferencing/Audio Conferencing			
16.	Multimedia projector			

SECTION D

ICT Policies and Strategies in the University (ICTPSU)

Please tick (✓) the following ICT policies and strategies geared toward effective utilization of ICT facilities as applicable to you in your center

Please rate the extent at which you agree with each statement below:

Strongly agree - (4) Agree - (3)

Disagree - (2) Strongly Disagree - (1)

S/N	ICT Policies and Strategies	4	3	2	1
1	Provision of official computers to all academic staff at the center				
2	Provision of capacity building on the use of computer/internet by academic staff				
3	Provision of free access to internet by academic staff in their offices				
4	Provision of internet access in the center's library				
5	Regular subscription of ICT resources (electronic journal, online databases etc) in the center's library				
6	Creation of awareness on access to internet/electronic resources in the center				
7	User education on access and use of ICT resources in the center				
8	Regular alert to academic staff on availability of relevant ICT resources in the center				
9	Regular maintenance of ICT infrastructures in the center				
10	Relevant policies to guide use of ICTs resources in the center				
11	Provision of internet connectivity and internet bandwidths				
12	Training and retraining of academic staff on their competency in utilization of ICT resources				

SECTION E

Factors that Facilitate the ICT Utilization (FFICTU)

How would you rate the factors that facilitate the utilization of Information and Communication Technology facilities in teaching and research?

S/N	ICT Resources Usage	Greatly	Moderately	Rarely	Poorly
1	Communication among instructor and learner				
2	Enhancement for research				
3	Educational administration				
4	Instructional system				
5	Delivery of course material				
6	Online tutorials and counseling				
7	Library service				

SECTION F

Influence of ICT Accessibility on Instructional Delivery and Research (IICTIDR)

Please tick these items on ICT Accessibility (✓) as applicable to you

Strongly agree - (4) Agree - (3)

Disagree - (2) Strongly Disagree - (1)

s/n	ICT Accessibility	4	3	2	1
1	Access and use of ICT resources increase my research productivity				
2	Access and use of ICT resources improve the quality of my research				
3	Access and use of ICT resources promote effectiveness and efficiency in my teaching				
4	Access and use of ICT enhances my academic productivity				
5	Access to ICT resources is a requisite for relevant research system				
6	Internet is a worthwhile tool for scholarly research				
7	ICT resources facilitate higher productivity				

SECTION G

Hindrances to ICT Facilities Utilization (HICTFU)

What do you think are the hindrances to the effective utilization of ICT facilities? Please rate the extent to which you agree with each statement below:

Strongly agree - (4) Agree - (3)

Disagree - (2) Strongly Disagree - (1)

S/N	Hindrances to ICT Utilization	4	3	2	1
1	Poor internet connectivity				
2	Financial problem				
3	Insufficient skill				
4	Poor training programme				
5	Excessive academic workload				
6	Insufficient ICT facilities and funding				
7	Poor ICT policies and strategies				
8	Poor economic situation				
9	Organizational, Social and Cultural Problems				
10	There is no long term staff development to support the integration of technology into instruction				
11	The hardware available was grossly insufficient to accommodate ICT supported teaching				
12	The software available was grossly inadequate to accommodate ICT supported teaching				
13	The hardware available had already outdated to accommodate ICT supported teaching				
14	No initiatiation of any program (such as seminar and workshop) to encourage ICT supported teaching				
15	The software available had already outdated to accommodate ICT supported teaching.				

APPENDIX II

Israel Model Sample Size
Sample size ±5%, ±7% and ±10% precision levels where confidence level is 95% and P =. 5

	Sample Size (n) for Precision Level		
Size of population	±5%	±7%	±10%
100	81	67	51
125	96	78	56
150	110	86	61
175	122	94	64
200	134	101	67
225	144	107	70
250	154	112	72
275	163	117	74
300	172	121	76
325	180	125	77
350	187	129	78
375	194	132	80
400	201	135	81
425	207	138	82
450	212	140	82

Israel and Glenn D. (2003)

APPENDIX III

DISSEMINATION, TIMELINE AND BUDGETS FOR THE STUDY

DISSEMINATION OF FINDINGS

The findings of this study will be disseminated to the following:

- The sampled open and distance learning management
- Both Federal and State government of the state used for the study
- Journal articles will be published
- Will be disseminated in seminars and conferences

TIMELINE

Proposed timeline to guide this study:

- Commenced the programme in 2014/2015
- Presented research proposal seminar on 26th May, 2016
- Presented small panel defense on 16th August, 2016
- Presented post-field defense on 31st August, 2017
- Proposed to present oral defense in May, 2018

APPENDIX1V

Budget

Budget Items **COST #**

- Postgraduate form……. 25,000
- First year school fees……116,800
- Accommodation for three years…….. 300,000
- Hp laptop……100000
- Modem……7,000
- Second year school fees……108,850
- Seminar proposal……55,000
- Pilot study……7,000
- Seminar defense……. 45,000
- Printing of scripts and rating scales……40,000
- Research assistants (2)……. 65,000
- Fieldwork transportation…….. 105,000
- Preliminary defense……..25,000
- Oral defense……..285,000
- Dissertation Production and Instrument Production……115,000
- Third year school fees……...120,350
- Fourth year school fees……124,000
- Dissemination of findings (3 conferences and 3 publications…… 310,000
- Dissertation Grammar Vetting…….. 30,000
- TOTAL…… 1,980,350
- (One million, Nine hundred and eighty thousand, Thr Naira only)
- Sponsorship: Brother

APPENDIX: V
Research Plan and Time line

Student starts in Nov. 2014	01/11/201	01/12/201	01/02/015	01/03/201 5	01/05/201	01/06/201	01/08/201	01/10/201	01/11/201	01/12/201	01/01/201	01/02/201	01/04/201	26/05/201	01/06/201	01/07/201	16/08/201	01/09/201	01/10201	01/11/201	01/12/201	01/01201	01/02/201	01/03/201	01/04/201	01./05/20	01/06/201	01/07/201	01/08/201 -
M O N T H																													
T A S K																													
Survey of literature																													
Approval of Topic																													
Write Proposal																													
Proposal defense																													
Correction of proposal																													
Construction of instrument																													
Validation of instrument																													
Proposal defense (small panel																													
Correction of Proposal (Small Panel)																													
Protocol defense																													
Correction of protocol																													
Gather Data																													
Thesis Writing																													
Write Introduction																													
Write Methodology																													
Results and Discussion																													
Conclusion																													
Acknowledgements, Appendices, etc.																													
Preliminary defense																													
Correction of preliminary																													
Proof Reading																													
Printing and Binding																													