

**KNOWLEDGE, ACCESSIBILITY AND USE OF INFORMATION  
COMMUNICATION TECHNOLOGY (ICT) AMONG STUDENTS  
AND TEACHERS IN THE DEPARTMENT OF NURSING  
SCIENCES UNIVERSITY OF NIGERIA, ENUGU CAMPUS**

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**M.Sc. DISSERTATION**

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UNIVERSITY OF NIGERIA ENUGU CAMPUS**

**OCTOBER, 2015.**

**TITLE PAGE**

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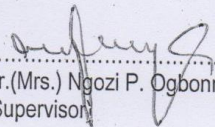
**DEPARTMENT OF NURSING SCIENCES  
FACULTY OF HEALTH SCIENCES AND TECHNOLOGY  
UNIVERSITY OF NIGERIA  
ENUGU CAMPUS**

**OCTOBER, 2015.**

### APPROVAL

This dissertation has been approved for the award of Master of Science Degree in Nursing in the  
Department of Nursing Sciences, Faculty of Health Sciences and Technology,  
University of Nigeria, Enugu Campus.

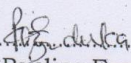
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### **CERTIFICATION**

This is to certify that this dissertation is the original work of Okolije Eucharía Okwudili with Registration Number PG/M.Sc/07/47180 except as specified in acknowledgement and references and that neither, the dissertation nor the original work contained therein has been submitted to the University or any other institution for the award of Degree.

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## **DEDICATION**

This work is dedicated to my son, Precious Munachimyi Okolije and all undergraduate students in Nigerian Universities who are destined to succeed in all spheres of life.

## ACKNOWLEDGEMENTS

My ultimate gratitude goes to the Almighty God who is my Source of all I have.

I remain indebted to my indefatigable supervisor Dr. (Mrs.) Ngozi P. Ogbonnaya for her motivation, encouragement and assistance given to me at all stages of the dissertation. Her motherly advice and conscientious corrections ensured the standard of this work. Be blessed by God today, tomorrow and at all times.

I give special thanks to the Head of department Dr. A.C. Nwaneri and all the lecturers for their untiring efforts to move this programme forward. To my lecturers Dr. Nwonu E.I., who gave much of herself as the reader at the proposal level of the work, Dr. (Mrs.) A. Chinwuba, Dr (Mrs.) Anarado, A.N., Dr. (Mrs), I.O. Ehimere, Dr. (Mrs) Madubuko, Prof. C.B. Okafor, Prof P. Ezenduka, and Mrs. P.N. Ihenacho whose contributions brought me thus far.

I will not fail to appreciate all the teachers and students in the Department of Nursing Sciences, Faculty of Health Sciences & Technology University of Nigeria Enugu Campus during the 2013-2014 academic session; who provided the data that made this study a success.

My candid gratitude equally goes to Prof. C.E. Ezedum, who in spite of his busy schedule, found it worthwhile to administer questionnaire for the pilot study and to Prof. Chukwunonso Okafo for painstakingly contributing to the standard of this work.

My special gratitude goes to Mr. Femi who devoted his precious time to analyze the data, and Mrs. Ngozi Dede, Amaka, and Bro. Emma who were the typesetters of the work.

I will not forget the labour of love of my husband, Pastor Don Okolije for his financial support. To my Precious son I say thanks for helping in typesetting and editing the work.

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## ABSTRACT

People over time, have devised various techniques for communicating their thoughts, needs and desires to others in every aspect of life. The emergence of ICT has affected all aspects of human life, including education at all levels. ICT knowledge, accessibility and use are linked with higher efficiency and higher productivity. Undergraduate nursing students and their teachers occupy a central position in both educational and health care systems of any country. This study was carried out to investigate the knowledge, accessibility and use of ICT among students and teachers in the Department of Nursing Sciences, University of Nigeria, Enugu Campus. A descriptive cross sectional survey design was used. All the 454 undergraduate students in the Department of Nursing and 23 teachers comprised the subjects for the study. A researcher-developed questionnaire was the instrument for data collection. Data were subjected to descriptive statistics and analyzed using student's t-test and Chi square. Probability value less than 0.05 was considered statistically significant. Majority of the students 346 (80.5%) and majority of the teachers 20 (90.9%) had knowledge of ICT. Respondents had access to the following ICT: computer; students 314 (73.0%), teachers 20 (90.9%), Internet; students 343 (79.8%), teachers 22 (100%) and e-mail; students 248 (57.7%) and teachers 17 (77.3%). The Internet activities mostly performed by the students were: browsing 386 (89.8%), chatting with friends 274 (63.7%) and e-mailing 262 (60.9%). The Internet activities mostly performed by teachers were: browsing 22 (100%), e-mailing 20 (90.9%) and downloading articles 18 (81.8%). Google is the most common search engine used by students 393 (91.4%) and teachers 20 (90.9%). High cost of ICT 281 (62.2%) and irregular power supply 258 (57.1%) were major factors that affect accessibility to and use of ICT negatively. There was no significant difference ( $p > 0.05$ ) in the access to ICT types among teachers and students. There was no significant difference ( $p > 0.05$ ) in the constraints associated with ICT use among students and teachers. There was significant difference ( $p < 0.05$ ) in the use of ICT between students and teachers. Findings of this study revealed that there is still need to provide ICT materials and training at subsidized rate in order to encourage use in university education.

## CHAPTER ONE

### INTRODUCTION

#### **Background to the Study**

People over time have devised various techniques for communicating their thoughts, needs and desires to others. In early civilized times, people achieved adequate communication through speech and written messages. Communication in teaching and learning situation were mainly done using a teacher-centered education system in the past few years (Adeyinka, Adedeji, Majekodunmi, Adika & Adeyinka, 2011) when the conventional way of teaching was the order of the day. The teacher was seen as the sole source of knowledge and the students were ómere receipientsô of his/her information. Chalk and talk methods were used in delivering lectures to students and pupils in schools.

The emergence of information communication technology (ICT) has affected all aspects of life (Nadira, Kamal & Banu, 2010). ICT has become an indispensable part of our contemporary world. No wonder the use of such terms as e-nursing, e-commerce, e-banking, e-medicine, e-government, e-learning and e-education just to mention but a few, to show how such aspects of life revolve round technology. ICT materials are adapted to carry out some routine activities in almost every aspect of life.

ICT includes any equipment or interconnect system of equipment that is used in the automatic acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data or information resources (National Information Technology Policy, 2010). This policy equally sees ICT as computers, ancillary equipment, software and firmware (Hardware) and similar procedures, services (including support services) and related resources. To the Federal

Ministry of Education (2010) ICT means all equipment, tools (inclusive of traditional technologies of radio, video and television to the newer technologies of computers, hardware, firmware, etc) as well as the methods, practices, processes, procedures, concepts and principles that come into play in the conduct of the information communication activities.

Globally, the emergence of ICT has stimulated rapid development in all sectors of the economy, especially in the socio-cultural and political spheres of life (Akanbi, 2005, in Olatokun, 2009). Ajayi (2003) noted that ICT is redefining the way almost everything is done and is a ready tool for all strata of the society. Danner (2013) stated that ICT has transformed the world into a large global connected community and play an increasingly important role in people's lives. Previous studies like those of (Idowu, Cornford & Bastin, 2008) and (kambi, 2005) have highlighted advantages and disadvantages that nations, institutions and industrial sectors would face if they did not position themselves to harness and implement ICTs as tools for leveraging their activities in the emerging global economy.

In educational sector, ICT has been continuously linked to higher efficiency, higher productivity, and higher educational outcomes, including quality of cognitive, creative and innovative outcomes (Adeosun, 2010). ICT is often perceived as a catalyst for change, change in learning approaches and in access to information (Watson, 2005) and can help by providing alternative possibilities for education (Casal, 2007, in Danner 2013). For both social and economic reasons students will need computer and communication technology skills to live successfully in a knowledge-based society (Danner, 2013).

The knowledge, access and use of ICT are becoming integral part of education in many parts of the globe (Ololube, 2006). To Danner (2013) education is the first and best key area for ICT application. Use of different ICT has become inevitable for students in learning. By using modern ICT, students and teachers can retrieve required information within a short time. Use of ICT has the potential to become cost-effective as it offers greater flexibility regarding time and location of teaching and learning, (UNESCO 2003). ICT also provides greater flexibility to adapt teaching and learning to meet the learners' cognitive and learning styles. ICT offers the learners the opportunity to work at their own pace. Betts (2011) affirmed that ICT can enhance the quality of learning where its use is tailored to lesson objectives and the needs of the learners. The use of ICT in teaching is a relevant and functional way of providing education to learners that will assist in imbuing in them the required capacity for the world of work. Very few jobs today do not require the use of skills in technology, collaboration, teamwork and information, all these can be acquired through teaching and learning with technology. ICT fundamentally changes the way we live, learn and work.

On the other hand, there are documented hindrances to using ICT in spite of its numerous benefits to both teachers and students. The factors hindering both teachers' and students' readiness and confidence in using ICT include teachers' lack of expertise with ICT, lack of confidence in using ICT by both teachers and students. Other factors include; insufficient knowledge of appropriate software and insufficient knowledge and skills on how to use ICT equipment, lack of knowledge of how to evaluate the use and the role played by ICT in teaching and learning is also another factor hindering use of ICT by both teachers and students (UNESCO, 2012).

Ofodu, 2007 in (Ajayi, Ekundayo & Haastrup, 2009) enumerated ICT tools used by both teachers and students to include; computers specifically; internet, telephone, digital

camera, and overhead projector. Other ICT materials include; compact disc-read only memory (CD-ROM), teleconferencing, audio-cassette tapes and video tapes, interactive television, electronic board, optical fibres, electronic notice board, slides, radio among others..

Teachers and students turn to ICT for various reasons such as removing distance from education and making knowledge more accessible to all. Development of a lifelong learning culture and the capacity to empower learners by providing them with multiple pathways that offer choices and channels to meet their education and training needs (UNESCO, 2003) is another reason why people use ICT. ICT is cost-effective as it offers greater flexibility regarding time and location of training delivery. ICT also provides greater flexibility to adapt teaching and learning to meet learners' cognitive and learning styles.

Teachers and nursing students have the obligation to know, access and use various instructional aids including modern ICT tools during their course of teaching and learning. This is because ICT is redefining the way almost everything is done and is a ready tool for all strata of society including education. ICT is changing the way people teach and learn, thereby offering new alternatives to the traditional classroom methods of teaching and learning. Teachers and students who are unaware of existing ICT may lose an important opportunity to make use of the positive features (cheap, safe, effective and accessible) of ICT as well as teach and learn accordingly. Teachers and students may not be able to harness all the benefits of ICT in Nigeria. Ofodu (2007) noted that Nigeria is a nation with constant power outage and poor infrastructural material supply in every stratum; her institutions of learning are not exempted as well. There may be lack of general information, access or misinformation about ICT used by both teachers and students during teaching and learning.

The knowledge, access and use of ICT during teaching and learning of nursing sciences are unknown. Studies carried out in Nigeria on ICT use were among the Reproductive Health Workers (Wole & Olufunke, 2009), ICT use in Nigerian Secondary Schools (Ajayi, Ekundayo & Haastrup, 2009). Adetimirin (2012), ICT literacy among undergraduates in Nigerian universities and Wole & Olufunke, (2009), provided information on Information on ICT use among Reproductive Health Care Workers (RHWs). The present study was conceived based on the fact that to the researcher's best knowledge there has not been any study done on ICT knowledge, access and use among teachers and students in the Department of Nursing Sciences, University of Nigeria Enugu Campus (UNEC).

### **Statement of problem**

The National Policy on ICT in Education and Framework launched in 2010 presents a holistic and broad vision for ICT integration in the education sector in Nigeria. This policy moves beyond a basic technology literacy approach. Rather, the policy focuses on leveraging technology to transform the roles of the teacher and the learner in the classroom.

In developed countries, the use of ICT by teachers and students in education has been widely studied and documented especially the positive influence of ICT in education (Kay, 2006; Mur-ray, Nuttall & Mitchell, 2008). Studies have also been conducted on the use of ICT by teachers and students in teaching and learning in developed countries where the use of ICT has advanced, and where there are resources and materials to maintain them (Adeyinka, Adedeji, Majekodunmi, Adika & Adeyinka, 2011).

Very few studies have been carried out in Nigeria on the use of ICT in education (Ololube, 2006). These studies were limited to attitude and competence in the use of

computers by academic and non-academic staff in Nigerian higher institutions. Unfortunately there were limited documented studies on knowledge, accessibility and use of ICT in education generally in Nigeria, and none was found in relation to nurse educators' and student nurses' knowledge, accessibility and use of ICT in Nursing Education.

However, the researcher observed that some undergraduate nursing students find it difficult to use ICT resources on their own to carry out basic learning activities such as sending e-mails, presentation of seminars and on-line registration of their courses. Equally, the researcher observed that both undergraduate and postgraduate research works are supervised mostly via use of paper and pencil materials as against how the researcher's friend who studies in Southern Africa is being supervised on-line.

**Purpose of the study**

The purpose of this study is to investigate students' and teachers' knowledge, accessibility and use of ICT in the Department of Nursing Sciences, University of Nigeria, Enugu Campus.

**Objectives of the Study**

The specific objectives of this study were to:

1. Ascertain students' and teachers' knowledge of ICT in Department of Nursing UNEC.
2. Determine accessibility to ICT among nursing students and teachers of Department of Nursing UNEC.
3. Investigate students' and teachers' use of ICT Department of Nursing UNEC.
4. To determine the constraining factors to use of ICT as perceived by students and teachers.

**Hypotheses**

1. There is no significant difference in the knowledge of ICT between students and teachers.
2. There is no significant difference in the use of different ICT types among students at different level of study.
3. There is no significant difference in the use of preferred ICT types among male and female students.
4. There is no significant difference in the accessibility to ICT use between the students and the teachers.

5. There is no significant difference in the constraints associated with ICT use between the students and the teachers.
6. There is no significant difference in the use of ICT between the students and the teachers.

### **Significance of the Study**

The findings will reveal whether both teachers and students actually understand what ICT means, whether they have access to ICT and also to what use they put ICT tools. This will help in academic decisions and review of teaching and learning process where necessary. Teachers will utilize the information from the study to plan teaching-learning activities to include softwares, hardwares and programmes to make teaching and learning easier, faster and learner centered. The findings will as well provide data for student's and teacher's individual decision making.

To the authorities; especially Departmental and the University administrators, the findings will serve as a guide to design appropriate in-service training programmes to update teacher's skills in ICT as well as integrating ICT into curriculum for students; to enhance their knowledge and use of ICT in relation to teaching and learning. To the stakeholders, it will give them insight on the activities of the Department in terms of ICT in the Department and plan programmes according to determined needs.

The findings of the present study is hoped to provide base line knowledge in this area and also fill the gap in the literature.

### **Scope of the Study**

The study is delimited to determining the knowledge, access and use of ICT. It is also delimited to undergraduate students and teaching staff of the Department of Nursing Sciences, University Nigeria Enugu Campus.

### **Operational Definition of Terms**

1. **Information Communication Technology (ICT):** Refers to hardwares, softwares and programmes that affect academic and non-academic activities of both students and teachers.
2. **ICT knowledge:** This refers to the undergraduate students and teachers ability to identify correctly the types and benefits of ICT. ICT knowledge also means ability to possess formal information about ICT.
3. **ICT Accessibility:** Accessibility to ICT in this study refers to students' and teachers' ability to possess or hire ICT materials and willingness and capacity to take advantage of the available ICT services.  
  
ICT accessibility is measured by items 14 -21 in the accessibility subscale of Information Communication Technology questionnaire (AICTQ).
4. **ICT use:** Refers to performing academic and non-academic activities using ICT. ICT use is measured by items 22 ñ 32 in the use subscale of Information Communication Technology questionnaire (UICTQ).

## **CHAPTER TWO**

### **LITERATURE REVIEW**

In this chapter, the reviewed relevant literatures are presented under the following headings:

- a. Conceptual review
- b. Review of related theory
- c. Empirical review
- d. Summary of reviewed literature

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

ICT can be described as a complex varied set of goods, applications and services used for producing, distributing, processing, transforming information, telecoms, television and radio broadcasting, hardware and software, computer services and electronic media, (Ozorji, 2010). ICT represents a cluster of associated technologies defined by their functional usage in information access and communication, of which one embodiment is the Internet. Bandele (2006) sees ICT as a revolution that involves the use of computers, internet and other tele-communication technology in every aspect of human endeavour. The author posited that ICT is simply about sharing and having access to data with ease. ICT is often associated with high-tech devices, such as computers and software, but ICT also encompasses more 'conventional' technologies such as radio, television and telephone technology, (UNESCO; 2013). ICT and computers are not the same thing.

Computers are the hardware that is often part of an ICT system. ICT is regarded as the super highway through which information is transmitted and shared by people all over the world. Jimoh (2007) in Ozoji 2010) defines ICT as the handling and processing of information (texts, images, graphs, instruction etc) for use, by means of electronic and communication devices such as computers, cameras, telephone. Ofodu (2007) also

refers to ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use. From these definitions, ICT could therefore be defined as processing and sharing of information using all kinds of electronic device, an umbrella that includes all technologies for the manipulation and communication of information.

### **Types of ICT**

There are varieties of technologies that can be used in education. Each of these technologies has its own redeeming qualities and limitations and different situations call for different technologies according to UNESCO, 2003:

**Internet/Web-Based Training:** Internet/Web-Based Training provides an environment where students and teachers access and study course materials online. It may involve the use of live e-learning tools such as application, sharing, internet, telephone, online whiteboards, discussion boards, and chat and messaging programmes that allow real-time interaction between instructors and learners. It can also be used to transmit text, graphics, images, animation, or video. The required tools for online learning include a personal computer and an Internet connection.

There are several ways a user can connect to the Internet: standard analog modem, Digital Subscriber Line (DSL), Cable Modem, Integrated Service Digital Network (ISDN), Local Area Network (LAN), Cellular, and Wireless broadband (fixed wireless and satellite). All the above connections, except for a standard analog modem connect are considered broadband connections. All these methods allow connections to an Internet Service Provider (ISP) that provides a gate way to the rest of the Internet. An analog modem and ISDN require a dial up connection where a user must dial in to connect to the ISP, whereas the other Internet access method denoted as always on connections, require no dialing.

**CD – ROM and DVD:** CD-ROM (Compact Disc Read Only Memory) store on any computer equipment with a CD-ROM drive (Hampton and Bartram, 2002 in UNESCO 2003). DVD (Digital Video Disk or Digital Versatile Disk) are similar to CD-ROMs and can be used the same way as CD-ROMs but contain more information. Most CD-ROMs have 650 or 700 mega bytes storage space whereas most DVDs have room for 4.7 gigabytes, which equals approximately seven times more storage space than a CD-ROM. DVDs are not widely used yet, mainly because of different standards for writing to DVDs.

CD-ROMs have a large capacity and can support the storage of information in a variety of formats including text, animation, video, audio, and graphics. Thus, learning materials can be presented in different ways. This allows the material to cater to multiple styles of teaching, (UNESCO, 2003).

CD-ROM or DVD is very durable and quality does not degrade after repeated use. However, scratching the surface or other abuse on the medium may prohibit it from being read by the CD-ROM drive. A major limitation with CD-ROM and DVD is that a computer with CD-ROM drive (in the case of DVD, a DVD-drive) is required to access the information. This equipment may not be available to learners in developing countries.

**Teleconferencing:** Teleconferencing refers to interactive electronic communication among people located at two or more different places. There are four types of teleconferencing based on the nature and extent of interactivity and the sophistication of the technology: audio conferencing, audio-graphic conferencing, videoconferencing and Web-based conferencing.

**Audio conferencing:** Audio conferencing involves the live (real-time) exchange of voice messages over a telephone network. When low-bandwidth text and still images

such as graphs, diagrams or pictures can also be exchanged along with voice messages, then this type of conferencing is called audio graphic. Non-moving visuals are added using a computer keyboard or by drawing and writing on a graphics tablet or whiteboard.

Audio conferencing allows two-way, real-time communication between instructors and learners through audio. Older audio conferencing technology uses the telephone system infrastructure, where the key component is an electronic device called an audio conferencing bridge. Using Internet telephony where digitized voice packets are sent between individuals over the internet. Individuals can use computer programmes such as instant messenger, micro soft net- meeting or MSN messenger to converse with individuals. Older audio conferencing technology simply includes local or long-distance telephone costs and the cost of the bridge itself.

Internet audio conferencing incurs the cost of internet access and the internet telephony equipment and or programmes. The main advantage of audio conferencing is that it allows for direct, two-way interaction between participants. Discussions occur in real-time where learners can ask questions and instructors can respond immediately. Audio conferencing technology also has low set-up and operating cost. The main disadvantage of audio conferencing technology is the absence of visual interaction between the instructors and the students.

**Video Conferencing:** Video conferencing allows participating individuals in different locations to see and hear each other in real-time through video-conferencing equipment. Older video conferencing technology uses leased telephone lines at high hourly rates and the installation cost of the type of system is expensive. It is also a more rigid

environment that requires special room set-up, advanced scheduling, and a professional operator (Dixon; 2000, in UNESCO 2003).

Recent video conferencing technology, however, uses the internet as the transmission infrastructure, thus decreasing the installation and usage costs. It also has the same advantage as the internet; flexibility, convenience, and ubiquitousness. The main advantage of video conferencing is that it allows real-time, two-way interaction between individuals in different places. Participating parties may be in remote areas and may be separated by large distances. All individuals involved in the educational system from the teachers, students, curriculum developers, and specialists, to the policy makers can participate in a video conference. It can be used for presentations, teaching sessions, discussions, course delivery (in combination with other media) and student support (Perration et al, 2002, in UNESCO, 2003). During course delivery and lectures instructors can gauge a student's progress and responsiveness immediately. Instructors can answer questions and provide feedback immediately.

The main drawback for video conferencing is the relatively high cost. Due to the high set-up cost video conferencing sites may not be readily available, especially in remote sites and developing countries.

**Audio-cassette tapes:** Audio tapes can be played by any standard cassette player. Through audio, the tapes can convey information that may be easier to illustrate with sound than simply through text or diagrams. It can accompany other means of instruction such as print based material and classroom teacher and provide detailed information step-by-step (UNESCO 2003).

Tapes are recordable and thus can be reproduced easily and cheaply. Tapes provide a permanent and flexible storage of information. The tapes can be stopped to allow for

classroom interaction and discussion and they can be replayed in instances where it might be beneficial to repeat parts of the lessons. Audiotapes provide only one-way communication where an external instructor cannot interact directly with students and they cannot gauge the progress of the students. Tapes lose their effectiveness if the information is presented as one long lecturer.

**Video Tapes:** Video tapes can be produced and edited by using a portable video camera and a home video editing suite. Video tapes can be viewed by using a TV and VCR combination.

Video tapes appeal to both audio and visual senses. Real-life situations can be presented and described using video as opposed to using text or audio. The learner has the flexibility to replay, pause, and rewind video tapes and can repeat lessons as often as they wish. Video tapes can support the teaching of practical skills delivered through open and distant learning. Caution must be exercised when developing video tapes so as not to include too much information as that could degrade the learning experience.

**Interactive Television:** In this context, interactive television refers to instruction occurring over broadcast television. It allows learners to receive live television instruction remotely; away from the actual instructor. The instructors are located at a broadcast studio and the learners view the instructors on a television monitor. The interaction is provided by one or more additional components. The actual broadcast can be achieved using geo-stationary satellite, microwave, and cable or fibre optics.

The main advantage of interactive television is that instruction can be transmitted to several different sites, and thus potentially reach a large number of learners using existing broadcasting infrastructure.

The main drawback of an interactive television system is its high cost, both at the main broadcasting site and the learner sites. This cost, however, can be offset if the instruction can reach a large enough number of people.

### **Types of ICT application in use in education**

**Computer applications:** Computer Applications also called computer programmes or software that instructs the hardware to perform certain tasks. The most commonly used software programmes are word processors, databases, spreadsheet and presentation graphic programmes.

1. **Word Processing:** The ability to save and manipulate words is probably the most used computer application. The word processing programme has numerous options to permit the user to specify the typeface, spacing and page layout. Documents can be automatically checked for spelling and grammar. Documents can also be individualized by merging them with name and address lists and can include pictures, tables and charts and graphical designs.
2. **Databases:** Database programmes are also used to manage detailed information. Within a database file are individual records that represent the person, product, or area information. The record contains fields that are characteristics of the record. Database programme has the ability to quickly search extremely large numbers of records and fields for commonalities and then help the user generate detailed and complete report.
3. **Spreadsheets:** Electronic spreadsheets are programmes that manipulate words and numbers. The data are arranged in cells formatted into columns and rows. The programme can perform many complicated manipulation on the data using formulas and directions that are entered or built into the software.

Spreadsheets are used extensively for managing budgets: database programs scheduling, invoicing and research.

4. **Communications:** Communication devices require software to guide the computer in connecting to a remote device and knowing what data to send or receive. Communication programmes use one more standard protocol depending on the form of communication such as file transfer, in order to communicate effectively with the distant site. An important type of communications software is electronic mail (e-mail). E-mail has become a standard method of communication world-wide.
5. **Presentation Graphics Programmes:** Presentation Graphics Programmes are software programmes used to create charts, graphs, tables, pictures, videos, audio and other non-text files. Users of this programme can create so-called slide shows for use in teaching and research presentations.

### **Different application of ICT in adult education.**

**Technology as Curriculum:** Technology as Curriculum involves developing ICT literacy skill. Two types of ICT literacy skills are - generic ICT literacy skill such as key boarding, word processing, using data bases, using spreadsheet, desktop publishing and using the internet for research communication (Kasworm & Londoner, 2000 in UNESCO, 2003). In this network economy every graduate needs to possess these essential generic ICT literacy skills.

The second ICT skill set is the occupationally specific ICT literacy skills such as those used in operating equipment with digital system controls.

**Technology as Delivery Mechanism:** The focus here is on packaging course content for digital delivery. Common approaches in current use include: computer- assisted

instruction (CAI), Computer-Based Instruction (CBI) and web-based or online instruction. Open and Distance Learning programmes make extensive use of technology as their delivery mechanism.

**Technology as a Complement to Instruction:** The emphasis here is on providing opportunities to practice skills taught and extending learning by working with specific software applications (Kasworn and Londoner, 2000 in UNESCO 2003). Simulators are often used to address safety concerns during the initial phase of training to offset cost in renting equipment for training. In its simplest form, technology can be used for drill practice to complement instruction.

**Technology as an Instructional Tool:** Human learning is a very complex process. In spite of research in education, our understanding of how humans learn is still limited (UNESCO, 2003). For some reasons educators strive to use little that is known about human learning whenever they engage in an act of teaching and learning. The learning process can be divided into two broad categories: learning conditions that are internal to the learner. This area is most difficult to affect though it is the place where the potential to improve learning outcomes is the highest and conditions of living external to the learner. This involves the five senses: Taste -1%, Touch -1.5, Smell - 3.5%, Hearing - 11%, Seeing - 83% (UNESCO,2003).

The amount of information that people retain is also an important aspect of learning. UNESCO, (2003), provides some interesting insights regarding the amount of retention through the various senses overtime:

| After 3 hours (%)         | After 3 days (%) |    |
|---------------------------|------------------|----|
| Material heard only       | 70               | 10 |
| Material seen only        | 72               | 20 |
| Material both heard/seen. | 85               | 65 |

### **Application of ICT to teaching and learning process**

The field of education has been affected by ICT, which has undoubtedly affected teaching, learning and research. ICT has the potential to accelerate, enrich, and deepen teaching and learning skills. ICT equally motivates and engages students to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthen teaching. In a rapidly changing world, basic education is essential for an individual to be able to access and apply information.

Conventional teaching has emphasized content. In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Within the conventional method of teaching; courses are written around textbooks. Teachers teach through lectures and presentations are interspersed with tutorials and learning activities designed to consolidate and rehearse the content.

Conversely, the contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and are more concerned with how the information will be used rather than with what the information is. Contemporary ICT use in teaching and learning is able to provide strong support for all these requirements. The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects

and development of intervention, change strategies, which would include teaching partnerships with ICT as a tool.

Syed (2012) stated three conditions which are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology. However, research studies show that most teachers do not make use of the potential of ICT to contribute to the quality of learning environments, although they value this potential quite significantly.

Benefits of ICT will be gained when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. The use of ICT enhances learning environments but also prepares next generation for future lives and careers. Other benefits of ICT use in teaching and learning include: changed pool of teachers will come with changed responsibilities and skills, teaching will become more facilitative than didactic. Integration of ICT into teaching and learning processes contributes to increase in the interaction and reception of information. Individual and collaborative learning are enhanced in the ICT models. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICT for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools.

Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of

knowledge transmission. In this domain learning is viewed as the construction of meaning rather than the memorization of facts. Learning approaches using contemporary ICT provides many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice. As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become. Teachers generate meaningful and engaging learning experiences for their students, strategically using ICT to enhance learning. Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which they will need in their future lives

### **Benefits of using ICT in education**

ICT provides students with tools they need to discover and own knowledge. ICT give students the hooks and templates they need to fasten information to the long-term memory. There are benefits of using ICT in education as revealed by (Blog, 2010):

**Motivating benefits:** ICT can act as a motivating tool for many students. Young people are very captivated with technology. Educators must capitalize on this interest, excitement, and enthusiasm about the Internet for the purpose of enhancing learning. For already enthusiastic learners, ICT allows the teacher to provide students with additional learning activities not readily available in the classroom.

**Fast Communication:** ICT promotes fast communication across geographical barriers. Students can join collaborative projects that involve students from different states, countries or continents. This type of learning experience was not possible before the

ICT. This is a unique learning experience very essential for each student as the world is becoming one big community.

**Cooperative Learning:** ICT facilitates cooperative learning, encourages dialogue, and creates a more engaging classroom. For example, an internet programme in one class may allow other students to get involved in class discussions through e-mails in a way not possible within the four walls of the classroom.

**Locating Research materials:** Apart from communication, research is what takes many people to the Internet. There are many more resources on the Internet than the school library can provide.

**Acquiring Varied Writing Skills:** If students are required to publish their work on the Internet, they have to develop hypertext skills. These skills help students gain experience in non-sequential writings. Moreover, and since the Internet is open to all with access, students publishing their work on the Internet are forced to be mindful of their language and to write to non-expert audience.

### **Disadvantages of using ICT in education**

The use of the ICT for education is not without problems. Therefore, one should expect the problems to be encountered in using the ICT in teaching in education to be evolving as well. There are some disadvantages of using ICT in education according to **(Blog, 2010)**:

**Plagiarism:** Apart from Web sites that claim to help students write term papers, there are numerous cases of students downloading information from the Net and turning them in for grades.

**Students' privacy may be compromised:** Criminals, marketers, and other persons can easily get information from students when they are online. These could pose danger to students' lives or may even lead to litigation against the school.

**Low Income Groups:** According to the US Department of Education, over 50% of public schools with a high minority enrollment had a lower rate of Internet access than public schools with a low minority enrollment in 1997. The same was true of instructional rooms in those schools. In addition, students from low-income families may not have computers at home or may have computers at home with no access to the Internet. Consequently, students in low-income communities may be disadvantaged. To reduce the effect that social or economic status may have, we should give Internet assignments that students can easily complete while in school. If necessary, schools may need to keep computer labs open for longer and/or odd hours. The use of computers at public libraries should also be encouraged.

**Long preparation Time:** It takes a lot of preparation time to effectively use the internet for education. In addition to designing Internet based lesson plans, one may have to surf the Internet to download lesson plans and adapt them to support the curriculum objectives or visit sites to select those appropriate for classes. Preparing lesson notes in order to help students become responsible users of the Internet may take a long time to achieve.

### **Problems militating against effective use of ICT in education**

There are certain factors which hinder nursing training institutions in Nigeria in providing quality ICTs knowledge and skills for nursing education as well as their use by both teachers and students. Some of these include lack of technically experienced lecturers, limited ICTs facilities and infrastructure, inadequate course content for ICTs trainings, lack of clear directions in the Nigeria National policy for Information Technology (NNDIT) on nursing education, lack of leadership by professional organizations, and problem of electricity. These factors are:

**Inconsistent Electric Power Supply:** Idowu, & Bastin, 2008) state that Nigeria as a country that finds it difficult to provide uninterrupted power supply (UPS) to its citizens will definitely have problems with deployment of good ICT services. He observed also that a lot of damages have been caused to both research institutes and computer laboratory equipments as computer components such as hard disks and mother board can be destroyed by interrupted and unreliable power supply. ICT equipment was made to function with other infrastructure such as electricity. Most internet facilities in Nigeria suffer frequent downturn due to power interruption and equipment damages due to incessant power interruption.

**Limited Technology Infrastructure:** (Especially internet access, bandwidth, hardware and software provision). The attitudes of various managements in and outside institutions towards the development of ICT related facilities such as the internet and procurement of computers is rather slow in some instances, and in others there are no aids or support by the government at all (Albirini, 2006) in Kwache 2007).

**High Cost of ICT Tools:** The price of computer hardware and software; which are major ICT tools in Nigeria is very high compared with the income of an average Nigerian. The high cost of these materials prohibits for most people, and even government establishment to buy.

**Lack of qualified ICT Personnel:** Kwache (2007) notes that most institutions lack computer literate teachers and ICT experts that would support and manage the internet connectivity and or for application of computing in the teaching learning process.

**Non-Inclusion of ICT Programmes in Teacher's education:** Non-Inclusion of ICT Programmes in Teacher's Training curricula and or at the basic levels of education.

There seems to be no clear and definite policy and or curriculum for all levels of the Nigerian education system.

**Lack of Maintenance Culture:** Lack of maintenance culture is another factor that is able to pose hindrances to effective ICT use in Nigeria higher institutions. Idowu et al (2008) notes that government agencies in Nigeria have no financial plans for maintenance of ICT equipments and allowances for depreciation in value for such ICT materials.

**Lack of time to experiment ICT:** Lack of time is a factor that may hinder ICT use in education as noted in (Mojgan, Kamariah, Wong, Bahaman & Foo,2009). The authors revealed that barrier to time to experiment manifest in two ways: (a) released time and (b) scheduled time. Lack of released time due to regularly scheduled classes for teachers may prevent teachers from using ICT in their classes as well as prepare materials for use with their classes. Lack of time scheduled on the time table to use ICT with students may pose a barrier to using ICT in classes.

## **Nursing Education in Nigeria**

### **The goals of nursing education**

The goal of nursing education over the years according to (Searle, 2000) has been to contribute to the health of individuals and the entire society. Initially, nursing had concentrated on the care and comfort of all the ill and injured but as a result of advances in health sciences, the emphasis is now placed on promotive, preventive and rehabilitative care. Therefore, nursing education aims at preparing competent polyvalent nurse practitioners who will use problem solving skills in providing safe, acceptable, effective and affordable health services to meet the health needs of individuals, families and communities at all levels of care (N&MCN, 2001).

To achieve the aim of nursing education, there should be a systematic direction of guidance of students through ICT. This is to ensure that adequate nursing knowledge is imparted to the students both theoretically and practically using modern technology to achieve proper skill and problem solving skill acquisition which will lead to efficient nursing care (Quinn, 2001).

### **Forms of Nursing Education in Nigeria**

N&MCN, standard of Nursing Education, 2010), broadly classified her education into two:

1. Non university based programmes such as,
  - a) Basic General Nursing Certificate programme. This is done in hospital based schools of nursing and it lasts for three (3) years. At the successful completion of this programme one is registered as a general nurse (RN).
  - b) Advanced Post Certificate Diploma. This is done in post basic schools of nursing e.g. school of midwifery and it lasts for eighteen (18) months. These are certificate courses.
2. University based programmes
  - a) Baccalaureate programme ñ Generic programme, consisting of candidates coming through direct entry and those coming through Universal Tertiary Matriculation Examination (UTME) in pursuit of Bachelor of Nursing Science (BNSC) done for 4 and 5 years respectively.
  - b) Higher degree programmes - Masters Degree in Nursing Sciences (M.Sc. Nursing), with specialization in Administration and management, Community Health Nursing, Nursing Education, Maternal and Child health, Medical-Surgical Nursing and Mental Health Nursing.

- c) Doctorate Degree in Nursing Sciences (PhD. Nursing). with specialization in Administration and management, Community Health Nursing, Nursing Education, Maternal and Child health, Medical- Surgical Nursing and Mental Health Nursing.

### **Non university based Nursing programmes**

The hospital-based diploma school of nursing was the first type of nursing school, the oldest method of nursing education (Kelly, 1985). Prior to the opening of the first hospital schools in the late 1800s, there was no formal preparation for nursing. Florence Nightingale later established the first school of nursing at St. Thomas's hospital England in 1860, the idea spread quickly to the United States (Kelly 1985; Berman et al 2008). Hospitals of course, welcomed the idea of training schools because, in the early years, such schools represented an almost free supply of nurse power.

With some outstanding exceptions, the education offered was largely of the apprenticeship type, there was some theory and formal classroom work, but for the most part students learned by doing, providing the majority of the nursing care for the hospital patients in the process. This is no longer true (N&MCN, 2001). Today in order to meet standards set in each state for operation of a nursing school and to prepare students to pass the licensing examinations, hospital based schools must offer their students a truly educational programme not just an apprenticeship. Hospitals conducting such schools employ full-time nurse tutors, offer students a balanced mixture of coursework (in nursing and related subjects in the physical and social sciences) and supervised practice and look to their graduate nursing staff, not their students to provide the nursing service needed by patients.

The educational programme has been generally three years in length. Students in this programme, complete extensive course work, clinical training, and work directly with patients under the supervision of registered nurses. The courses in hospital based programmes emphasize practical skills used to diagnose and treat medical patients; conditions. Such course cover specific areas like Pediatric Nursing, Nursing Theories, Nursing Ethics, Psychiatric Nursing, Surgical Nursing, Emergency Nursing and other related courses (N&MCN, 2001, Kelly, 1985 & Berman, Synder, Kozier & Erb, 2008).

Hospital based nursing programme argued Kelly (1985) could be said to be an alternative to university based education with the advantages being more hands-on clinical training and a shorter time period to graduating. The goal of the programme stated N&MCN (2001) has been to contribute to the health of individuals and the entire society. Hospital based programme initially had concentrated on the care and comfort of the ill and injured but as a result of advances in health services the emphasis is now placed on promotive, preventive and rehabilitative care. Nursing education in Nigeria takes cognizance of the National Policy on Education in the development of sound educational principles which are essential to the preparation of these nurses to function as members of interdisciplinary and intersectorial teams. This programme forms the basis for the practice of nursing. The Nursing and Midwifery Council which is a body that guides and regulates all nursing programmes in Nigeria mapped out for the programme a suitable curriculum which aims at preparing competent polyvalent nurse practitioners who will use problem solving skills in providing safe, acceptable, effective and affordable health services to meet the health need of individuals, families and the community at all levels of care.

Candidates for admission into the programme must possess the Senior Secondary School Certificate or West African Examination Certificate or its equivalent with five credits to include English Language, Mathematics, Physics, Chemistry and Biology at not more than 2 sittings (N&MCN, 2001). The program is a six semester programme of study. The courses in the first year of the programme is designed 001 level with a prefix of (General Nursing). The courses in the second and third year are designated 002 and 003 levels with the same prefix respectively. During the training, emphasis is on integrating theory with related practical demonstration and clinical experience. All tutors are expected to work with students in the community/hospital and act as preceptors. Preference is given to interactional teaching method. Upon successful completion of the requirement of the General Nursing Education Programme, the graduated is awarded a General Nursing Certificate. The graduated is also required to seek registration as a "Registered Nurse" with the Nursing and Midwifery Council of Nigeria and be licensed to practice as a "General Nurse" in community and hospital settings in Nigeria. This license for practice is renewable every 3 years in accordance with the rules and regulations of the Council (N&MCN, 2001).

### **Baccalaureate Nursing Programme:**

The first baccalaureate programme also called BSN in nursing was established in 1909 under the control of the University of Minnesota, through the efforts of Dr. Richard Olding Beard. Since then, these programs have become an increasingly important part of nursing education (Kelly, 1985).

An individual who enrolls in a baccalaureate degree programme in nursing obtains both a university education culminating in a bachelor's degree and preparation for licensure and practice as a registered professional nurse.

The programme considered by the ANA as minimum preparation for professional nursing is usually four academic years in length, (ANA, 2001). In Nigeria this programme is a five year programme in which students must usually take up to 60 units of general education requirement while also fulfilling 100 ñ 106 units of education in the nursing field, a full time programme. The programme includes courses in a general education and the liberal arts, the sciences germane and related to nursing, and in nursing. In some programmes, the student is not admitted to the nursing major (nursing courses) until the conclusion of the first two years of university study. In other programs, nursing content is integrated throughout the five years (ANA, 2001).

As in the other nursing programmes, the baccalaureate programme has both theoretical content and clinical experience. The baccalaureate student, who studies courses in the physical and social sciences, will have greater depth and breath, because students majoring in nursing take the college's courses in the sciences and humanities with students majoring in pure physical and social science courses. Nursing major meet the same admission requirements of five credits which includes English Language, Mathematics, Physics, Chemistry and Biology, with the required JAMB cut off or equivalent which is RN Certificate and are held to the same academic standard as all other students. The nursing program is an integral part of the college or university as a whole (N&MCN, 2001).

The baccalaureate programme in nursing, which is offered by a college or university, provides students with an opportunity to acquire knowledge of the theory and practice of nursing; competency in selecting, synthesizing, and applying relevant information from various disciplines; ability to assess client needs and provide nursing interventions; ability to provide care for groups of clients; ability to work with others; ability to evaluate current practices and try new approaches; competency in

collaborating with members of other health disciplines and with consumers; and understanding of the research process and its contribution to nursing practice; knowledge of the broad function of the nursing profession is expected to perform in society; a foundation for graduate study in Nursing (NLN Council of Baccalaureate and Higher Degree Program 1976 cited in Hayes, 2006 ).

Nurses are prepared as generalist at the baccalaureate level to provide within healthcare system a comprehensive service of assessing, promoting and maintaining the health of individuals and groups. These nurses are prepared to be accountable for their own nursing practice, accept responsibility for the provision of nursing care through others; accept the advocacy role in relation to clients; and develop methods of working collaboratively with other health professionals. They will practice in a variety of health settings ñ hospital, home and community- and emphasize comprehensive health care, including prevention, health promotion and rehabilitation services, counseling and education and care in acute and long term illness (ANA, 2001).

Baccalaureate nursing programmes are conceptually organized to be consistent with the stated philosophy and objectives of the parent institution and the unit in nursing (ANA, 2001). These programmes provide the general and professional education essential for understating and respecting people, various cultures and environments; for acquiring and utilizing nursing theory upon which nursing practice is based; and for promoting self-understanding, personal fulfillment; and motivation for continued learning. The structure of the baccalaureate degree programme in nursing follows the same pattern as that of baccalaureate education in general. It is characterized by a liberal education at the lower division level, on which is built the upper division major. In baccalaureate nursing education, the lower division consists of fundamental courses drawn primarily from the scientific and humanistic discipline inherent in liberal learning. The major in

nursing is built upon this lower division general education base and is concentrated at the upper division level. Upper division studies include courses that complement the nursing component or increase the depth of general education.

The roles of a baccalaureate nurse are sometimes described as those of a practitioner engaged in direct patient care, teacher, leader, collaborator, and student (an inquiring person). On completion of the programme, most BSN graduates select hospitals as their place of employment, but then often turn to public health nursing (NLN, 2000; Kelly, 1985).

## **Review of related theory**

The Planning model for the integration of e-learning is the theory underpinning this study. This theory was developed by the Conference Board of Canada in 2001. The Planning model is used to integrate e-learning in workforce development. It is used in ICT mediated learning where careful planning are required to avoid pitfalls, such as: allowing decisions to be driven by technology, overlooking existing educational and ICT systems, unclear statements of objectives to be achieved and underestimating the front-end and ongoing funding requirements( Farrell, 2001).

### **Planning model for integrating ICT**

The Planning Model for Integration of ICT is a model necessary for successful implementation of ICT - mediated learning where careful planning is required in workforce development, (Farrell, 2001). It was originally developed by the Conference Board of Canada in 2001 (UNESCO, 2003). The Planning model for Integration of ICT has four distinct phases: Planning, Building, Improving and Integrating.

**Planning phase:** The planning phase involves the assessment of the needs of the organization, teacher and learners in relation to the capacity of the learning technologies. The planning phase includes the following steps:

1. Developing a team: Bring all key stakeholders together to ensure buy-in and sound decision-making.
2. Assessing organizational needs: Assess previous e-learning experiences, and assess support for e-learning and determine benefits.
3. Defining learners' needs and expectations: Establish benchmarks regarding computer literacy, language skills, access to information and communication technologies, and learning needs.
4. Understanding how e-learning is different: Analyze the differences

between e-learning and other traditional delivery approaches such as classroom-based instructor-led training.

5. Defining the work processes to be involved in e-learning: Determine the work processes, programme, or courses within which e-learning will be integrated and how technology will be used.
6. Assessing and leveraging existing ICTs: Assess existing infrastructure, equipment, courseware, e-learning experience, and trainers and employee ICT literacy.
7. Defining the budget: Assess all costs and determine where the money will come from.
8. Getting a seat at the information technology system table: Build rapport and working relationship with IT colleagues.
9. Defining model of e-learning: Determine if you are going to buy services, content, and technology externally, or develop them internally, or apply some combination of these two options.

**Building phase:** The purpose of the Building phase is to develop an e-learning model complete with external vendors and suppliers and outcome measures to assess programme success as described in the following steps:

1. Assess the vendor market and products: Develop criteria for assessing vendors of e-learning products.
2. Research e-learning options by content, technology, and service: Assess proposal of content providers, technology providers, and service providers. Examine programme requirements to determine if content should be developed internally or externally.
3. Develop measures: Identify key success factors and develop an evaluation plan

4. Involve employees in content development: Engage employees in the content development. They can be provided with a template that they can populate with their knowledge.
5. Repurpose content with caution: Assess existing instructional materials that can be used and packaged so they can fully benefit from the interactive possibilities of e-learning delivery.
6. Leverage equipment supplier training: Develop partnership with equipment supplier to gain access to existing e-learning packages.
7. Partner with other organizations: Develop partnership with other institutions/organizations to gain access to existing e-learning packages.
8. Don't bite off more than you can chew: Begin with a small-scale project that can demonstrate the success of e-learning.

**Integration phase:** This phase is designed to promote e-learning to administrators, instructors, and learners, providing professional development as required and collecting data as the process evolves.

1. Integrate, do not implement: Implementation is a top-down approach.  
Integration is a more collaborative approach that can assist in building a successful e-learning community.
2. Develop e-literacy: Develop an e-literacy programme to assist learners in becoming familiar with ICTs.
3. Provide adequate ICTs: Ensure the availability and accessibility of ICTs in sufficient quantities.
4. Train the trainers: The integration of e-learning requires a unique skill set.  
Provide adequate training to instructors.
5. Track, link and measure: Use all data collected to monitor the success of

e-learning.

6. Provide time to learn: Time is a barrier to e-learning. It is imperative to provide adequate time to all (teachers and students).
7. Develop mechanisms for content management and upgrading: Establish a system for managing and updating content.
8. Communicate: Communicate the importance of e-learning to all stakeholders (teachers, students and the entire organization).
9. Build communities: Build e-learning communities on the basis of specific knowledge or content areas to solve problems, learn together, and construct and share knowledge.

**Improvement phase:** This phase of the e-learning integration process focuses on improvement by researching new technologies, approaches, strategies, and techniques.

Improvement involves the following steps:

1. Check and evaluate: Analyse all data collected to identify strengths, weaknesses, successes, and failures.
2. Determine improvements: Identify areas of e-learning needing improvement.
3. Assess and integrate new technologies: Keep abreast of technological development in e-learning and integrate technologies that facilitate and enhance learning.
4. Scale up or out: Successful organizations or institutions can at this point develop external partnerships to sell their training programmes in order to recover their e-learning investments.

### **Application of the Planning model for integrating ICT to the study**

Three distinct phases of planning model for integrating ICT: planning, integration and improvement may explain the decision making process that informs the use of ICT among students and teachers.

**Planning phase:** An organization, teacher or student who intends to use ICT in teaching or learning assesses the needs of the organization, teacher or learner (student) in relation to the capacity of the learning technologies. Assessment of previous e-learning experience and benefits of ICT should also be made. Description of how ICT will be used as well as determination of the cost of ICT materials should also be made.

**Integration phase:** The aim of this phase is to promote ICT integration among instructors (teachers) and learners (students) by providing professional development and collecting data as the process evolves. Integration means collaborative approach that can assist in building successful ICT community. E-learning programmes such Computer appreciation, Microsoft word and Microsoft access to assist learners in becoming familiar with ICT can be developed. Provision of adequate ICT to ensure availability and accessibility of ICT materials in sufficient quantities is equally involved in this stage. Adequate time to learn with ICT in line with content consideration should also be provided.

**Improvement phase:** A teacher or student who uses ICT is in a position to identify the strengths and weaknesses of those ICT and also in a position to integrate technologies that facilitate and enhance learning.

## E-Learning Planning Process

### Phase1: Planning

- Develop team
- Assess organizational needs
- Define learner's needs and expectations
- Understand how e-learning is different
- Define work processes to be involved
- Assess and leverage existing ICTs

### Phase 2: Building

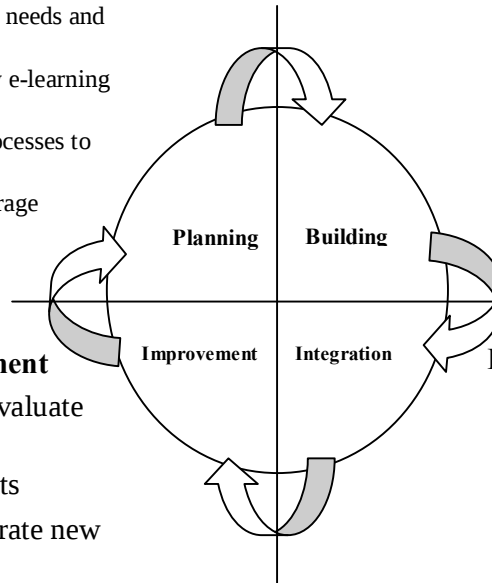
- Assess vendors and products
- Research options by content, technology and service
- Develop measures
- Involve employees in content development
- Repurpose content with caution
- Leverage equipment supplier training
- Partner with other organizations
- Don't bite off more than you can

### Phase 4: Improvement

- Ç Check and evaluate
- Ç Determine improvements
- Ç Assess/integrate new technologies

### Phase 3: Integration

- Ç Integrate, don't implement
- Ç Develop e-literacy
- Ç Provide adequate ICTs
- Ç Train the trainers
- Ç Track, link and measure
- Ç Provide time to learn
- Ç Develop mechanisms for content management and updating



**Figure 1: Planning Model for Integrating ICT in Education (Adopted from “The Conference Board of Canada, 2001).**

## **Empirical review**

Knowledge level assessment, accessibility and use of ICT among teachers and students are interesting areas that require research work. In developed countries, research on knowledge level, access and use of ICT among teachers and students are quite available.

Khan, Bhatti & Khan, (2011) in a descriptive study in Bahawalpur used 200 students which was the sample for the study to measure students' use of ICT. Questionnaire was the instrument they used for data collection while SPSS software was the statistical measure used. The study revealed that 23(19.5%) were male and 132 (80.5%) respondents were female. The study also revealed that internet use varies according to the different information needs of the users: a vast number of respondents use Google search engine:126 (76.8%), 43 (26.2%) respondents were found Yahoo users, while 5 (3.0%) respondents use MSN, 3 (1.8%) respondents use Alta Vista, 2 (1.2%) respondents Hot Boot, 3 (1.8%) respondents Lycos and 2 (1.2%) respondents use Netscape .80 (48.8%) access ICT at their departmental computer lab, 52 (31.7%) respondents use at their class room,15 (9.1%) respondents use library, 5 respondents (3.0%) avail it at their university hostel, 6 (3.7%) respondents access at net café while 4 (2.4%) respondents use it at their friends' homes.

Naglea, Heather & Clarke, (2004) in their study: 'Assessing Informatics in Canadian Schools of Nursing,' had a target population of all Canadian Schools of Nursing with undergraduate education programme. Their sample size was 81. Findings from the study include the following: Information and Communication Technology (ICT) Access: They observed that universal access to the Internet, e-mail, library, software programmes and computers ~100% for faculty; less to

students (~20% less). Universal access to research data-bases is available to faculty in ~75% of the schools; less so for students. Availability of ICT in classrooms is inadequate. Faculty has more classrooms is inadequate. Faculty has more access to ICT than students. A desirable level of access is available in less than 1/3 of schools. There is greatest access to the library (68% faculty; 43% students) and least to clinical information systems (22% faculty; 14% students). Students' greatest access to clinical applications is in acute care settings and least in home care. Human Resources: Technical human resources (e.g. computer lab technicians) are more adequate to integration of Nursing Informatics (NI) into undergraduate education program than human resources relevant to teaching. Less than 1/3 of the schools perceived that faculty and new students have adequate NI competencies and computer skills. Approximately 1/4 of the schools are likely to have clinical preceptors/staff with adequate competencies. Approximately 5% schools are likely to have adequate graduate students to assist with teaching NI and using ICT. Educational applications of ICT: WEB-CT or other distant ICT applications are used in approximately 3/4 of the schools. There is variability in use of educational ICT, primarily due to limited school resources.

A Study on the Use of ICT in Mathematics Teaching by Chong, Sharaf & Jacob, (2005) in Malaysia among teachers in the State ministry of Education . Survey method was used. Sample size was 111. One hundred and eleven questionnaires were returned. Their findings were: The five most popular application packages used by mathematics teachers were word Processing packages (71.1%), spreadsheets (51.2%), search engines (44.1%), presentation Software (36.9%) and drill and practice software (24.3%). Courseware (49.5%) and presentation tools (40.5%) were used widely for teaching mathematics. 68.5% of the

respondents used the browser to gather information. More than half of the respondents (56.8%) did not receive any professional training in ICT. A large proportion (64.9%) did not have any training on how to Integrate ICT into mathematics teaching. 33.3% of the respondents requested to have training on how to integrate ICT into teaching. 71.7% of the respondents said that they use ICT infrequently or had not used ICT at all in the class. Some major barriers *hindering* the implementation of ICT in mathematics teaching were found to be the lack of time in school schedules for projects involving ICT, the lack of adequate technical support for ICT projects, inadequate teacher training opportunities for ICT projects, the lack of knowledge about ways to integrate ICT to enhance the Curriculum and to integrate and use different ICT tools in a single lesson.

Erah and Dairo (2008) carried out a descriptive study on use of Learning Management System (LMS) which is a special ICT Programme among Pharmacy students in Nigeria ñ Benin. The study was carried out to elicit information on access to computer and internet, problems in applying ICT materials and perception of e-learning among Pharmacy students in Pharmacy Education in the University of Benin. Questionnaire was used to elicit information on ICT use from 165 (sample size) Pharmacy students who were recruited for the study. Out of this number (84%) had access to internet, only 16.1% owned computers and majority (82.1%) use cybercafés for internet access. Frequent electric power failure, inadequate computer materials and skilled personnel, and slow internet speed were identified by 64.8 (82.5%) of the students as problems in using computer materials in the University. While willingness to pay was not considered a problem, 80.4% of the students were only willing to

pay not more than US\$ 7.96 per semester for internet access. Over 92% of them felt that ICT will make teaching and learning more exciting and effective when combined with the traditional teaching approach. The researchers recommended that ICT use may improve teaching and learning of Pharmacy.

Aguele (2007) in his descriptive study on information and communication technology challenges for teaching and learning in Nigeria among university teachers. Sample consists of 240 university teachers. A questionnaire was used to elicit information on ICT challenges for teaching and learning. He noted that teaching staff of public universities in Nigeria were favourably disposed to the use of the computer. They however, showed lack of enthusiasm towards integrating ICT into the teaching and learning process. According to him quite a large number of university teachers are familiar with the use of e-mail and internet facilities for personal and research purposes. Universities lack adequate facilities to implement the integration of ICT procedures into teaching and learning process. Teaching staff and students of universities are not adequately prepared for the use of ICT tools in teaching and learning process. Universities lack adequate fund to effectively finance ICT services. Universities are not able to purchase sufficient bandwidth for their ICT installations due to prohibitive costs. Few institutions have their VSATs while some others still depend on wireless link to local ISPs. Universities do not have enough digital centres to cater for the needs of staff and students. Though large number of teaching staff uses internet services, they are yet to have internet access in their personal offices he concluded.

Adetimirin (2012), in her work on ICT literacy among undergraduates in Nigerian universities reveals that computer, telephone and the Internet were the three ICT mostly used by the undergraduates, although more on an occasional basis. The undergraduates in the state universities xx and Imo State University(BSU and IMSU) were found to have poor ICT literacy skills in the use of the three ICT with over 25%, while those with average ICT literacy skills were in the federal universities (ABU and UNIMAID). Three major factors affecting the ICT literacy of the undergraduates were identified as irregular power supply, inadequate ICT and limited duration of the use of the ICT.

Wole et al (2009) provided information on ICT use among Reproductive Health Care Workers (RHWs) in Nigeria. *The study adopted a descriptive survey design. Stratified sampling technique was used to select a sample of 360 RHWs of the University College Hospital, Ibadan. A questionnaire obtained the data.* Their major findings include: ICT facilities, such as computers, scanners RHW groups. Multimedia projector: Results revealed that the usage level of this technology by the pharmacists was highest, with 100%, followed by the medical doctors, the nurses and nurse/midwives, with 95.4%, 71.7%, and 66.2% levels, respectively. Internet Service Provider (ISP): Nurses and pharmacists scored the highest percentage, with 100 percent usage level, followed by the medical doctors with 98.1% and the nurse/midwives with 96.2%.

Electronic Mail Facilities/Services: The use of e-mail facilities/services was highest among the medical doctors (95.4%). The level of use was also high among the nurses (89.3%), nurse/midwives (86.5%), and pharmacists (75.0%).

World Wide Web (WWW) Access: Response to the question on the use of the WWW was lower, compared with the other questions, with just 260, or 76%, of

the respondents answering the question. Of this number, medical doctors had the highest proportion (59.9%), followed by nurses/midwives (20.4%), nurses (14.2%), and pharmacists (5.5%). Video Conferencing: Results also revealed that 208 (63.4%) of the respondents indicated using videoconferencing..Medical doctors were in the majority at 49.7%, followed by nurses (27.3%), nurse/midwives (20.2%), and pharmacists (3.8%).

Sex Differentials in Usage Level of ICTs: The average usage level of all the facilities and services was higher among male respondents than their female counterparts, although the disparity varied among technologies. For example, more than 99% of the male respondents in the UCH indicated using the computer linked with ISP compared to their female counterpart at 97.4%. However, the usage level of multimedia projector among the male gender was 95.1%, compared with 77.2% among the female gender. The usage levels of the WWW, e-mail, and video conferencing technologies followed a similar trend, with e-mail showing the greatest disparity of all measured technologies. Common Places the RHWs Access ICT. The common places of access to ICT by the RHWs showed that 74.6% of the RHWs claimed to use ICT in cybercafés. Two-hundred and eleven (61.7%) respondents claimed that they use ICTs in their offices, while 52.6% used it in their homes. One hundred and six (31%) used it in schools (both secondary and tertiary), while the remaining 9.1% chose the category óother,ô specifically churches, hotels and friends's homes. Activities for which RHWs use ICTs: majority (90%) of the RHWs always use ICTs for communication.

Archibong & David (2009) investigated ICT in University Education: Usage and challenges among Academic staff. The population was 230 academic staff in

Cross River University of Technology (CRUTECH) using accidental method. A questionnaire was designed to collect data from a sample size of 80 academic staff in Cross River University of Technology. Staff were approached in their offices and those willing to respond to the research instrument were allowed to do so. Findings from their study showed that 42(52.5%) of the respondents had personal computers (laptop / desktop) while 38(47.5%) did not have. In terms of access to internet; 73(91.25%) had access to internet through public cyber café, 4(5%) had access at home while 3(3.75%) indicated they had access to it at school. The findings equally revealed that ICT is of much help to the academic staff in the areas of upgrading of knowledge 72(90%); research 70(87.5%); publication 62(77.5%) and sending of e-mails 60(75%).

Their finding equally indicated that the academic staff indicated that ICT is of little / no help to them in the areas of organization of student data 53 (65%); giving of assignment to students 56(70%); and preparing of course outline/content 51(63.75%). *The obstacles to academic staff ICT usage according to these authors include* weak infrastructure 65(81.25%); financial constraints 47(58.75%); and lack of access to ICT facilities 37(46.25%); lack of operational knowledge and skill 58(72.5%); no training opportunity 53(66.25%); insufficient time for practice 52(65%) and inability to keep abreast with present technological changes/demands 49(61.25%) .

Adeyinka, Adedeji, Majekodunmi, Adika & Adeyinka, (2011) studied: An Assessment of Secondary School Teachers Use of ICT: Implication for Further Development of ICT Use in Nigeria Secondary Schools. This study employed a descriptive survey method. Their sample consists of 700 teachers of Nigeria

Secondary Schools. Questionnaire was used. Their findings include: On the issue of access to ICT in the respondents various schools, the result generally showed that aside of other identified ICT; it's only the Internet and e-mail facilities that respondents did not have access to. The study also showed that ICT technical support and Internet facility are lacking in all the respondents schools, while other facilities like hardware, software, computer consumables and other ICT equipment like digital camera and data projector were adequate and available. Their findings also showed that teacher's expertise and lack of knowledge to evaluate the use and role of ICT in teaching are the two prominent factors hindering teacher's readiness and confidence in using ICT

In a study by Ajayi, Ekundayo and Haastrup (2009) on the application of information and communication technology in Nigerian secondary schools among teachers and principals of the secondary schools in Ondo and Ekiti States. The sample consists of 320 teachers and 40 principles randomly selected from the secondary schools in Ondo and Ekiti States. The result showed that ICT facilities like computers, radio (tape recorders), television sets, video disc players, bulletin boards were available in schools while some materials like projectors, electronic notice boards, internets, film strips are scanty available in schools. The perceived benefits of ICT use according to these researchers include enhancing quality of work of both teachers and students (89.2%); helping teachers to reach out to colleagues in other parts of the country (88.1%); enhancing efficiency of workers (88.1%) and making teaching-learning more interesting (86.1%). Other perceived benefits include making teachers to be up to date in their various disciplines (85%); and enhancing their management of financial records (85%); reducing bureaucracy in administration (82.2%); making easy and faster the decision

making in the education sector (81.4%) and helping in distance learning programmes (71.1%). Their findings showed that the major challenge facing the adoption of ICT in Nigerian schools is irregular power supply (98.1%). Another challenge facing the adoption of ICT is lack of computer literate teachers (89.4%). Other major challenges are lack of fund in schools (84.7%); inadequate facilities to support the application of ICT (82.2%) and the fear of exposing too much information on the school to the public (82.2%).

### **Summary of the Reviewed Literature**

For several years the educational institutions of many African nations have witnessed poor knowledge, access and use of ICT. Nigeria has set a wide array of ambitious goals of several global and national frame works that seek to promote the fundamental rights of her citizens to quality education. A significant challenge for Nigeria is that, despite all her efforts, Nigeria is one of the only two countries that were at the risk of not meeting the target of EFA because of the quality of teaching and learning in our schools.

It has been discovered that ICT promotes learner- centered learning and provides effective and efficient framework for the world of work, study and play. Various ICT types, benefits, activities, and constraints were highlighted.

Planning model for the integration of e-learning developed by the Conference Board of Canada was used to explain the theoretical review while various empirical reviews were used to explain practical works done by other researchers as regards; knowledge, access and use of ICT. Constraints encountered by the students and teachers in accessing and using ICT were discussed in line with the literature review.

## **CHAPTER THREE**

### **RESEARCH METHOD**

This chapter discussed the research methods used for the study under: research design, area of study, population of the study, subject for the study, instrument for data collection, validity of instrument, reliability of instrument, ethical consideration, procedure for data collection and method of data analysis.

#### **Research Design**

Descriptive cross-sectional survey design was used for this study. Cross-sectional design was adopted because there was no manipulation of any condition; rather the subjects were investigated in a more or less natural environment (Polit & Beck, 2010). The design was successfully used in similar studies among students and teachers in Bahawalpur (Khan et al, 2011) and in Nigeria (Adetimirin, 2012).

#### **Area of Study**

The study was carried out in Nursing Sciences Department of the Faculty of Health Sciences and Technology (FHS&T), University of Nigeria Enugu Campus. The Department of Nursing Sciences runs both undergraduate and postgraduate nursing programmes. The postgraduate programme comprises the master's and doctoral programmes. The University of Nigeria of Nigeria Nsukka has two Campuses: Nsukka and Enugu. Both campuses are located at Enugu State. Enugu State is in the South-East geopolitical zone of Nigeria. University of Nigeria was established in 1963 while the Department of Nursing Sciences was established 20 years later, in 1983. Within Enugu Campus is the Faculty of Health Sciences and Technology. Department of Nursing Sciences is one of the

Departments in the Faculty of Health Sciences and Technology. There is only one functional ICT centre owned by the university which located at her Lagos Area. The ICT centre has its own stand-by generating-plants This centre only serves the ICT needs of the staff: academic and non-academic ones. There are several functional commercial cybercafé located at all areas of the university. These commercial cybercafé are open for use to all staff and students who can afford the cost.

### **Population of the Study**

The population of this study included all the undergraduate students and all teachers (lecturers) in the Department of Nursing Sciences, UNEC. According to the Departmental Office (Record, 2014), the undergraduate Nursing students comprised of: 97 from 200 level, 122 from 300 level, 131 from 400 level, 104 from 500 level and teachers 23 (see Appendix 1). Thus, a total population of four hundred and seventy seven (477): undergraduate Nursing students (454) and their teachers (23) constituted the population of the study.

**Table 1: List of Classes with their population**

| <b>Item</b>  | <b>Subject of study</b> |
|--------------|-------------------------|
| 200<br>97    | level                   |
| 300 level    | 122                     |
| 400 level    | 131                     |
| 500 level    | 104                     |
| Teachers     | 23                      |
| <b>Total</b> | <b>477</b>              |

**Source: Department of Nursing Office Record, 2013/ 2014 session**

**Criteria for selection**

- Willingness to participate in the study.
- Availability at the time of data collection.
- Students must be in 200, 300, 400 and 500 levels in the Nursing Sciences Department.
- Teachers must be academic staff of the Nursing Sciences Department, irrespective of cadre, gender and age.

**Instrument for Data Collection**

Data were collected using a questionnaire developed by the researcher titled: Students' and Teachers' Information Communication Technology Knowledge, Access and Use Scale (SAT-ICT-KAUS). The instrument consists of two sections A and B. Section A contains 7 items on the respondents' socio-demographic characteristics. Section B consists of closed ended questions. There are 4 subscales namely: knowledge about ICT (7 items), access / availability to ICT (8 items), use of ICT (11 items) and factors affecting access and use of ICT (1 item). The questions were designed to generate data to address the research objectives, research questions and hypothesis.

**Validity of instrument**

The face and content validity of the researcher-developed questionnaire were carried out by giving the instrument to the project supervisor and two other lecturers; one in Nursing Education and the other a lecturer in Computer Sciences respectively. They were asked to examine the purpose, research objectives as well as the hypothesis of the study in line with the specific items in the instrument. They made necessary modifications in the instrument which were

effected. The final draft was submitted to the research supervisor who approved it after due corrections were made.

### **Reliability of the instrument**

The instrument was subjected to pre-test. The test was administered to 43 students and 2 teachers in Madonna University, Elele Campus, Rivers State. These students and teachers were similar to the group under study. Cronbach's Alpha was used to analyse the data. An alpha of 0.797 and an inter-item (standardized) coefficient of 0.806 were obtained for the students while alpha of 0.893 and an inter-item (standardized) coefficient of 0.886 were obtained for the teachers. The result being greater than 0.7 indicates that the research Instrument is very strong (see appendix 1). The instrument is therefore considered reliable and fit for collecting data for the study.

### **Ethical Consideration**

The study was conducted after approval was obtained from the Research Ethical Committee of the University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu, (see Appendix 2). Both administrative permission and the letter of introduction were obtained from the Head of Department of Nursing Sciences (see Appendix 3) to collect data from students and teachers.. In addition the nature and purpose of the research were explained to the teachers and respective class representatives. Informed consent of the respondents was also obtained (See Appendix 4).

### **Procedure for data Collection**

Five research assistants who were; a lecturer and four class representatives from 200, 300, 400 and 500 levels respectively from the Department of Nursing

Sciences, University of Nigeria Enugu Campus were recruited for data collection. The research assistants were trained on aims, purposes and objectives of the study, use of informed consent form and how to conduct a research. Prior to data collection, initial visits were made to each class by the researcher with an introductory letter from the Head of Department of Nursing Sciences. These visits provided a forum for introduction of rapport between the researcher and the students as well as the teachers.

With the help of the five research assistants, the researcher then administered the consent form to students and teachers who met the inclusion criteria. All students and teachers who participated were given an explanation on the study. The students who signed the consent forms to participate in the study had copies of the questionnaire on SAT-ICT-KAUS administered to them in their class rooms during break periods whereas the teacher had theirs either in their offices or homes. The filling and collection were done on the spot. The researcher visited each class during lecture days twice a week. The completed questionnaires were retrieved after the students and lecturers daily filled them. Data collection lasted for a period of three weeks.

### **Method of data analysis**

Data generated for the study were collated, tallied, organized and analyzed descriptively using means, standard deviations frequencies and percentages, and results presented in tables. Data were equally analyzed inferentially using students-t-test and chi square. Probability value less than 0.05 was considered statistically significant. All analyses were done using Statistical Package for Social Sciences (SPSS) version 17.

## **CHAPTER FOUR**

### **PRESENTATION OF RESULTS**

The results of the data analysis are presented in this chapter. The results are presented in the tables according to objectives and hypothesis that guided the study.

#### **Return rate:**

Out of the 477 copies of questionnaire administered, 462 were returned. Out of the 462 returned, 10 were not completed appropriately and were removed, remaining 452 which were properly completed and fit for analysis. This gives a 94.76% return rate. The results of data analysis were presented in the Tables below according to objectives and hypotheses set for the study.

#### **Socio-demographic Characteristics of the Respondents**

Descriptive statistics involving frequencies and their percentages were used to analyze data on socio-demographic profiles of the respondents. The results of the analysis were presented in Table 2 below:

**Table 2: Socio-demographic characteristics of the respondents**

**n = 452**

| <b>Items</b>                                | <b>Students<br/>n=430</b> | <b>Lecturers<br/>n=22</b> | <b>Total<br/>n = 452</b> | <b>x<sup>2</sup></b> | <b>df</b> | <b>P-<br/>value</b> |
|---------------------------------------------|---------------------------|---------------------------|--------------------------|----------------------|-----------|---------------------|
| <b>1.Age Group</b>                          |                           |                           |                          |                      |           |                     |
| 18-24years                                  | 215 (50.0%)               | 0(0.0%)                   | 215 (47.6%)              | 299.5                | 6         | 0.00                |
| 25-31years                                  | 179 (41.6%)               | 3(13.6%)                  | 182(40.3%)               |                      |           |                     |
| 32-38years                                  | 27(6.3%)                  | 2(9.1%)                   | 29(6.4%)                 |                      |           |                     |
| 39-45years                                  | 9(2.1%)                   | 3(13.6%)                  | 12(2.7%)                 |                      |           |                     |
| 46-52years                                  | 0(0.0%)                   | 5 (22.7%)                 | 5 (2.7%)                 |                      |           |                     |
| 53-59years                                  | 0 (0.0%)                  | 4 (18.2%)                 | 4 (0.9%)                 |                      |           |                     |
| 60-66years                                  | 0 (0.0%)                  | 5 (22.7%)                 | 5 (2.7%)                 |                      |           |                     |
| Mean Age                                    | 25.3(±4.2%)yrs            | 47.8(±12.4%)yrs           |                          |                      |           |                     |
| <b>2.Gender</b>                             |                           |                           |                          |                      |           |                     |
| Female                                      | 350 (81.4%)               | 18(81.8%)                 | 368(81.4%)               | 0.002                | 1         | 0.96                |
| Male                                        | 80(18.6%)                 | 4(18.2%)                  | 84(18.6%)                |                      |           |                     |
| <b>3.Marital Status</b>                     |                           |                           |                          |                      |           |                     |
| Married                                     | 80(18.6%)                 | 18(81.8%)                 | 98(21.7%)                | 49.252               | 1         | 0.00                |
| Single                                      | 350 (81.4%)               | 4(18.2%)                  | 354 (78.3%)              |                      |           |                     |
| <b>4.Religion</b>                           |                           |                           |                          |                      |           |                     |
| Christianity                                | 430(100%)                 | 22(100%)                  | 452 (100%)               |                      |           |                     |
| <b>5.Years of Study<br/>(students only)</b> |                           |                           |                          |                      |           |                     |
| 200 Level                                   | 93 (21 .6%)               |                           |                          |                      |           |                     |
| 300 Level                                   | 119 (27.7%)               |                           |                          |                      |           |                     |
| 400Level                                    | 115 (26.7%)               |                           |                          |                      |           |                     |
| 500 Level                                   | 103 (24.0%)               |                           |                          |                      |           |                     |
| <b>6.Rank (lecturers only)</b>              |                           |                           |                          |                      |           |                     |
| Professor                                   |                           |                           |                          |                      |           |                     |
| 0(0.0%)                                     |                           |                           |                          |                      |           |                     |
| Senior Lecturer                             |                           | 9 (40.9%)                 |                          |                      |           |                     |
| Lecturer I                                  |                           | 3(13.6%)                  |                          |                      |           |                     |
| Lecturer II                                 |                           | 2 (9.1%)                  |                          |                      |           |                     |
| Graduate Assistant                          |                           | 8 (36.4%)                 |                          |                      |           |                     |

The result on Table 2 shows that students' age ranged from 18-45 years in which half 215(50.0%) of them were within the age range of 18-24 years and 179(41.6%) were within the age range of 25-31 years. The mean age for students was 25.3( $\pm 4.2$ ) years. The lecturers' age ranged from 25-66 years of which 5(22.7%) of them are within the age range of 46-52 and 60-66 years respectively. The mean age for teachers was 47.8( $\pm 12.4$ ) years. There is significant relationship in the age range of students and lecturers ( $P < 0.05$ ). There is no significant relationship in the gender of the students and lecturers ( $P > 0.05$ ) but most 368 (81.4%) of them were females. The marital status showed that majority 350(81.4%) of students were single, while majority 18(81.8%) of the teachers were married and there exists a significant relationship ( $P < 0.05$ ).

All the students and lecturers 452 (100%) were Christians. Among the students their year- of- study were almost evenly distributed in which 93(21.6%), 119(27.7%), 115(26.7%) and 103(24.0%) were in 200 level, 300 level, 400 level and 500 level respectively, while among the lecturers, most 9(40.9%) of them were senior lecturers, and 8(36.4%) were graduate assistants.

#### **Objective 1: To determine students' and teachers' knowledge of ICT**

This objective was realized using items 7 ñ 13 in the questionnaire. The data collected on these questions were analyzed using frequencies and percentages.

The results are presented in Tables 3, 4, 5 and 6 below:

**Tables 3, 4, 5 and 6: Knowledge of ICT among students and lecturers**

**n = 452**

| Items                                                                                                                        | Students<br>n=430 | Lecturers<br>n=22 | Total       | x <sup>2</sup> | df | P-value |
|------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------|----------------|----|---------|
| <b>7. Have you received any form of training or exposed on ICT?</b>                                                          |                   |                   |             |                |    |         |
| Yes                                                                                                                          | 346(80.5%)        | 20(90.9%)         | 366 (81.0%) | 1.482          | 1  | 0.22    |
| No                                                                                                                           | 84(19.5%)         | 2(9.1%)           | 86(19.0%)   |                |    |         |
| <b>8.What type of computer training did you receive?</b>                                                                     |                   |                   |             |                |    |         |
| Formal                                                                                                                       | 265 (61.6%)       | 19(86.4%)         | 284(62.8%)  | 5.594          | 2  | 0.06    |
| Non-formal                                                                                                                   | 81(18.8%)         | 1(4.5%)           | 82(18.1%)   |                |    |         |
| None                                                                                                                         | 84(19.5%)         | 2(9.1%)           | 86(19.0%)   |                |    |         |
| <b>9. If you have received any form of training or exposure to ICT, what kind of training were you exposed to?</b>           |                   |                   |             |                |    |         |
| Computer Appreciation                                                                                                        | 214(61.8%)        | 18(90.0%)         | 232 (63.4%) | 8.398          |    | 0.39    |
| Microsoft Word                                                                                                               | 270(78.0%)        | 19(95.0%)         | 289 (79.0%) |                |    |         |
| Microsoft Excel                                                                                                              | 200(57.8%)        | 15(75.0%)         | 215 (58.7%) |                |    |         |
| Microsoft Access                                                                                                             | 121 (35.0%)       | 11(55.0%)         | 132(36.1%)  |                |    |         |
| CorelDraw                                                                                                                    | 125 (36.1%)       | 7(35.0%)          | 132(36.1%)  |                |    |         |
| Adobe Acrobat                                                                                                                | 69 (19.9%)        | 12 (60.0%)        | 81(22.1%)   |                |    |         |
| E-mail                                                                                                                       | 178 (51.4%)       | 19(95.0%)         | 197(53.8%)  |                |    |         |
| Internet                                                                                                                     | 168 (48.6%)       | 16(80.0%)         | 184(50.3%)  |                |    |         |
| Others (PowerPoint, Publisher, etc)                                                                                          | 34(9.8%)          | 3(15.0%)          | 37(10.1%)   |                |    |         |
| <b>10.If you have not received any form of training or exposure to ICT, how do You access information from the Computer?</b> |                   |                   |             |                |    |         |
| Help from a friend                                                                                                           | 30(35.7%)         | 0 (0.0%)          | 30(34.9%)   | 2.060          |    | 0.560   |
| Paid agents                                                                                                                  | 16(19.0%)         | 1 (50.0%)         | 17(19.8%)   |                |    |         |
| Cyber cafe assistant                                                                                                         | 28 (33.3%)        | 1(50.0%)          | 29 (33.7%)  |                |    |         |
| Others (personal effort)                                                                                                     | 10(11.9%)         | 0(0.0%)           | 10(11.6%)   |                |    |         |

\*Response not exclusive

The result on Table 3 shows the knowledge of ICT among students and teachers. The result shows that most 366(81.0%) of the respondents had received some form of training or exposure to ICT, while 86(19.0%) had not received any form of training or exposure to ICT but the result is not significant between students and lecturers ( $P>0.05$ ). Majority 284(62.8%) of the respondents had received formal computer training, while 82 (18.1%) of them had non-formal computer training, but the result is not significant between students and lecturers ( $P>0.05$ ). From among the 366(81.0%) respondents that had received some form of training or exposure to ICT, most of them 289 (79.0%) had training on Microsoft Word, 232 (63.4%) had training on Computer Appreciation, but only few 81(22.1%) received training on Adobe Acrobat. This is not significant between students and teachers ( $P>0.05$ ), As regards the remaining 86(19.0%) respondents that had not received any form of training or exposure to ICT, most of them 30 (34.9%) always get help from a friend while 29 (33.7%) from cyber-cafe assistant, This also is not significant between students and lecturers ( $P>0.05$ ).

**Table 4: Respondents' knowledge and confidence in using computer accessories**

**n = 452**

| Items                                                        | Students n=430 |     |     |     |      |      | Lecturers n=22 |    |   |    |      |      | t-test | P Value |
|--------------------------------------------------------------|----------------|-----|-----|-----|------|------|----------------|----|---|----|------|------|--------|---------|
|                                                              | VC             | QC  | C   | NC  | Mean | SD   | VC             | QC | C | NC | mean | SD   |        |         |
| 11. Indicate your knowledge confidence in using the computer |                |     |     |     |      |      |                |    |   |    |      |      |        |         |
| a. Use of mouse                                              | 290            | 56  | 51  | 53  | 3.40 | 0.97 | 16             | 2  | 2 | 2  | 3.45 | 1.01 | 0.246  | 0.806   |
| b. .Use of keyboard                                          | 181            | 90  | 104 | 55  | 2.92 | 1.08 | 12             | 7  | 2 | 1  | 3.36 | 0.85 | 1.879  | 0.061   |
| c. .Customizing desktop environment                          | 90             | 102 | 107 | 131 | 2.35 | 1.12 | 7              | 2  | 4 | 9  | 2.32 | 1.32 | 0.133  | 0.894   |
| d. Windows installation                                      | 50             | 68  | 104 | 208 | 1.19 | 1.05 | 4              | 2  | 6 | 10 | 2.00 | 1.16 | 0.370  | 0.715   |
| e.Microsoft Word Processing                                  | 113            | 92  | 93  | 132 | 2.43 | 1.18 | 13             | 3  | 3 | 3  | 3.18 | 1.14 | 2.914  | 0.004   |
| f..Microsoft Excel                                           | 74             | 76  | 97  | 183 | 2.10 | 1.13 | 3              | 4  | 5 | 10 | 2.00 | 1.11 | 0.385  | 0.700   |
| g.Microsoft Access                                           | 61             | 49  | 98  | 222 | 1.88 | 1.09 | 2              | 3  | 5 | 12 | 1.77 | 1.02 | 0.458  | 0.647   |
|                                                              | 46             | 56  | 88  | 240 | 1.79 | 1.04 | 2              | 2  | 2 | 16 | 1.55 | 1.01 | 1.064  | 0.288   |
|                                                              | 75             | 69  | 99  | 187 | 2.07 | 1.14 | 14             | 2  | 3 | 3  | 3.23 | 1.15 | 4.460  | 0.000*  |
|                                                              | 34             | 42  | 76  | 278 | 1.61 | 0.95 | 2              | 3  | 0 | 17 | 1.55 | 1.06 | 0.305  | 0.761   |
| Grand mean                                                   |                |     |     |     | 22.5 | 7.71 |                |    |   |    | 24.4 | 7.46 |        |         |
| Mean of means                                                |                |     |     |     | 2.25 | 0.7  |                |    |   |    | 2.44 | 0.75 |        |         |

**\*Significant, P>0.05**

Key: VC = Very Confident; QC = Quite Confident; C = Confident; NC = Not Confident.

The result on table 4 showed the mean scores and standard deviations of each of the 10 items on knowledge confidence in using computer among students and lecturers on 4 point Likert scale in which an item mean of 2.5 and above is regarded as high knowledge confidence in the use of computer while an item below 2.5 is regarded as low knowledge confidence in the use of computer. In addition, a two sample t-test was computed for each item to establish the acceptability or otherwise of each item as indicator of knowledge confidence in the use of the computer and also to establish a significant difference for each item between students and teachers.

The item mean scores and standard deviations for the 10 items on knowledge confidence in computer use ranged from 1.61(SD=0.95) to 3.40(SD=0.97) for students; and 1.55 (SD=1.06) to 3.45(SD=1.01) for the lecturers

The result shows that only two items namely: 'Use of mouse' (3.40; SD=0.97) and 'Use of keyboard' (mean=2.92; SD= 1.08) had mean scores above 2.5 which is the scale critical mean while the remaining eight (8) items had mean scores below 2.5 for the students. The result also shows that four (4) items namely; 'Use of mouse' (mean=3.45; SD=1.01); 'Use of keyboard' (mean=3.36; SD= 0.85); 'Microsoft power point' (mean=3.23; SD=1.15); and 'Microsoft word Processing' (mean=3.18; SD=1.14) were the highest scored items above 2.5 which is the scale critical mean while the remaining six(6) items had scores below 2.5 for teachers.

As regards the significance of the above findings, the result shows that on the 'Use of mouse' and 'Use of keyboard', both the students and lecturers had mean scores above 2.50 and it is not significant ( $P>0.05$ ). This implies that they both

have confidence in the use of mouse and keyboard and the level of their confidence is not significant. On 'Customizing desktop environment', Windows installations, Microsoft Excel, Microsoft Access, Microsoft Office Publishing and Web publishing; both the students and lecturers had mean scores below 2.5 for each of those items and this is not significant ( $P>0.05$ ). This implies that they both not confident in Customizing Desktop Environment, Windows Installations, Microsoft Excel, Microsoft Access, Microsoft Office Publishing and Web Publishing and there is no significant difference in the students and lecturers low level of knowledge confidence in the use of those computer applications. On Microsoft Word Processing, the student had the mean score of 2.43(SD=1.18), while the teachers had the mean score of 3.18(SD=1.14) and it is significant ( $P<0.05$ ). This implies that the teachers are more competent in Microsoft Word Processing, than the students. Concerning Microsoft PowerPoint, the student had the mean score of 2.07(SD=1.14), while the lecturers had mean score of 3.23(SD=1.15) and it is significant ( $P<0.05$ ). This implies that the teachers are more competent in Microsoft PowerPoint usage than the students are not. The subscales mean score of both the students and lecturers were below 2.50 and this is not significant. This implies that overall, both the students and the teachers are not very confident in using computer.

**Table 5: Respondents' opinion on the benefits or usefulness of ICT**  
n = 452

| Items                                                                   | Students<br>n=430 | Lecturers<br>n=22 | Total          | $\chi^2$ | P-value |
|-------------------------------------------------------------------------|-------------------|-------------------|----------------|----------|---------|
| <b>12. In your opinion, what are the benefits or usefulness of ICT?</b> |                   |                   |                |          |         |
| Using ICT makes lesson more interesting                                 | 357<br>(83.0%)    | 18<br>(81.5%)     | 375<br>(83.0%) | 8.610    | 0.952   |
| Using ICT makes teaching more enjoyable                                 | 318<br>(74.0%)    | 16(72.7%)         | 334<br>(73.9%) |          |         |
| Using JCT makes lesson more diverse                                     | 254(59.1%)        | 10(45.5%)         | 264<br>(58.4%) |          |         |
| Using ICT improves presentation of learning materials                   | 327<br>(76.0%)    | 21(95.5%)         | 348<br>(77.0%) |          |         |
| Using ICT makes lectures easier to understand                           | 273<br>(63.5%)    | 18(81.8%)         | 291<br>(64.4%) |          |         |
| Using ICT increases students' motivation                                | 297(69.1%)        | 15(68.2%)         | 312<br>(69.0%) |          |         |
| Using ICT improves students' learning                                   | 303<br>(70.1%)    | 11(50.0%)         | 314(69.5%)     |          |         |
| Using ICT makes lecture easier to deliver                               | 277(64.4%)        | 21(95.5%)         | 298 (659%)     |          |         |
| Enhances recall of previous learning                                    | 236<br>(54.9%)    | 11(50.0%)         | 247<br>(54.6%) |          |         |
| Provides new stimuli                                                    | 233<br>(54.2%)    | 12(54.5%)         | 245<br>(54.2%) |          |         |
| Provides systematic/steady feedback in learning                         | 222<br>(51.6%)    | 10(45.5%)         | 232 (51.3%)    |          |         |
| Provides access to rich sources of information                          | 275<br>(64.0%)    | 16(72.7%)         | 291<br>(64.4%) |          |         |
| ICT is learner-centred-learning tool                                    | 231(53.7%)        | 12<br>(54.5%)     | 243<br>(53.8%) |          |         |
| Gives me more confidence                                                | 221<br>(51.4%)    | 12<br>(54.5%)     | 233<br>(51.5%) |          |         |
| Makes teaching more fun                                                 | 249<br>(57.9%)    | 16(72.7%)         | 265<br>(58.6%) |          |         |
| Makes learning more fun                                                 | 258<br>(60.0%)    | 11(50.0%)         | 269<br>(59.5%) |          |         |
| Makes my administration more efficient                                  | 204(47.4%)        | 9(40.9%)          | 213<br>(47.1%) |          |         |
| Gives me more prestige                                                  | 207(48.1%)        | 12(54.5%)         | 219(48.5%)     |          |         |

**\*Responses not exclusive**

The results on Table 5 show the respondents' knowledge of the benefits or usefulness of ICT. The first three highest scored items were that 'Using ICT makes lesson more interesting' 375 (83.0%), 'Using ICT improves presentation of learning materials' 348 (77.0%), and 'Using ICT makes teaching more enjoyable' 334(75.9%). Also, the least three scored items were, 'ICT makes my administration more efficient' 213 (47.1%), 'ICT gives me more prestige' 219 (48.5%), and 'ICT provides systematic/steady feedback in learning' 232 (51.3%). These opinion on the benefits or usefulness of ICT is not significant between the students and lecturers ( $P>0.05$ ).

**Table 6: Respondents' competence in ICT applications**  
n =452

| Items                                                              | Students<br>n=430 |          |    |    |     |             | Lectur<br>es<br>N=22 |    |    |    |        |                              | t-test       | P-<br>value |
|--------------------------------------------------------------------|-------------------|----------|----|----|-----|-------------|----------------------|----|----|----|--------|------------------------------|--------------|-------------|
|                                                                    | Ex                | Gd       | Fr | LC | NC  | Mean/SD     | Ex                   | Gd | Fr | LC | N<br>C | Mea<br>n                     |              |             |
| <b>13. How competent are you in the following ICT applications</b> |                   |          |    |    |     |             |                      |    |    |    |        |                              |              |             |
| Word processing                                                    |                   |          | 92 | 37 | 96  | 3.17±1.45   | 8                    | 10 | 3  | 1  | 0      | 4.14<br>0.83                 | 3.118<br>118 | 0.00*       |
| File navigation                                                    | 95<br>41          | 10<br>58 |    |    |     |             |                      |    |    |    |        |                              |              |             |
| Internet browsing                                                  | 203               | 100      | 53 | 15 | 59  | 3.87±1.40   | 13                   | 9  | 0  | 0  | 0      | 2.77<br>1.41<br>4.59<br>0.50 | 1.099        | 0.27        |
| E-mailing                                                          | 149               | 120      | 57 | 25 | 79  | 3.55±1.47   | 14                   | 7  | 1  | 0  | 0      | 4.59<br>0.59                 | 2.416        | 0,01*       |
| Presentation tools                                                 | 46                | 91       | 98 | 70 | 125 | 2.68±1.37   | 7                    | 9  | 3  | 2  | 1      | 3.86<br>1.13                 | 3.313        | 0,00*       |
| <b>Mean of Means</b>                                               |                   |          |    |    |     | <b>3.14</b> |                      |    |    |    |        | <b>3.99</b>                  | <b>3.502</b> | <b>0.00</b> |

\* P<0.05 is significant

Key: Ex = Excellent; Gd = Good; Fr = Fair; Lc = Low capability; Nc = No Capability.

The result on Table 6 shows the mean scores and standard deviations of each of the (five) 5 items on competence in ICT application between students and teachers on a 5-point Likert scale in which an item mean of 3.0 and above is regarded as high competency while an item mean below 3.0 is regarded as low competence in the use of ICT applications. The mean scores for the 5 items on competency in ICT application ranged from 2.45(SD =1.34) to 3.86 (SD = 1.40) for students; and 2.77(SD =1.41) to 4.59(SD = 0.50) for lecturers. The result shows that three items namely; 'Internet browsing' (mean = 3.87;SD = 1.40); 'E-mailing' (mean = 3.55; SD =1.47); 'Word processing' (mean = 3.17; SD = 1.45) were scored above 3.0 which is the critical scale mean; while the remaining two items had mean scores below 3.0 for the students. The result also shows that four (4) out of the five (5) items in this subscale; namely; 'Internet browsing' (mean = 4.59; SD = 0.50); 'E-mailing' (mean = 4.59; SD = 0.59); 'Word processing' (mean = 4.14; SD = 0.83); and 'Presentation tools' (mean = 3.86; SD = 1.13); had mean scores above 3.0 which was the critical scale mean; while only one item; 'File navigation' (mean = 2.77;SD = 1.41) had a mean score below 3.0 for the lecturers.

As regards the significance of the above findings, the result of two samples t-test for the items shows that on 'Word processing'; the students had mean score of 3.17(SD=1.45), while the lecturers had the mean score of 4.14(SD=0.83) and it is significant ( $P<0.05$ ). This implies that the lecturers are more competent in using Word Processing than the students. On internet browsing, the students had the mean score of 3.87(SD=1.40), while the lecturers had mean score of (4.59; SD = 0.50) and it is significant ( $P<0.05$ ). This implies that the lecturers are more competent in using internet browsing than the students. On 'E-mailing', the

students had the mean score of (3.55; SD =1.47), while the lecturers had the mean score of (4.59; SD = 0.59) and this is significant ( $P<0.05$ ). This implies that the teachers are more competent in using "E-mailing" than the students. On "Presentation tools"; the student had the mean score of 2.68(SD=1 .37), while the lecturers had mean score of 3.86(SD=1 .13) and this is significant ( $P<0.05$ ). This implies that the lecturers are confident in using presentation tools, while the students are not. On File Navigation; both the students and lecturers had mean scores below 3.00 and it is not significant ( $P>0.05$ ). This implies that they are both not competent in file navigation and the level of their incompetence is not significant.

**Objective 2: To determine ICT availability/accessibility to students and teachers**

To realize this objective, items 14 ñ 21 in the questionnaire were used. The data collected on these questions were analyzed using frequencies and percentages.

The results were presented on Table 7.

**Table 7: Availability/Accessibility of ICT to Students and teachers**  
n = 452

| Items                                                          | Students<br>N=430 | Teachers<br>N=22 | Total       | $\chi^2$ | df | P-<br>value |
|----------------------------------------------------------------|-------------------|------------------|-------------|----------|----|-------------|
| <b>14. What type of ICT are available to your institution?</b> |                   |                  |             |          |    |             |
| Computer                                                       | 314(73.0%)        | 20(90.9%)        | 334(73.9%)  | 8.976    |    | 0.83        |
| E-mail                                                         | 248 (57.7%)       | 17(77.3%)        | 265 (58.6%) |          |    |             |
| Internet                                                       | 343 (79.8%)       | 22(100%)         | 365 (80.8%) |          |    |             |
| Digital camera                                                 | 120 (27.9%)       | 5 (22.7%)        | 125 (27.7%) |          |    |             |
| Scanner                                                        | 160 (37.2%)       | 8(36.4%)         | 168 (37.2%) |          |    |             |
| Video                                                          | 124(28.8%)        | 7(31.8%)         | 131 (29.0%) |          |    |             |
| Data projector                                                 | 187(43.5%)        | 16(72.7%)        | 203 (44.9%) |          |    |             |
| Slides                                                         | 157 (36.5%)       | 9(40.9%)         | 166(36.7%)  |          |    |             |
| Film strips                                                    | 66(15.3%)         | 4(18.2%)         | 70(15.5%)   |          |    |             |
| Electronic notice boards                                       | 72(16.7%)         | 2(9.1%)          | 74(16.4%)   |          |    |             |
| Disc player                                                    | 128(29.8%)        | 5(22.7%)         | 133 (29.4%) |          |    |             |
| Bulletin boards                                                | 113 (26.3%)       | 6 (27.3%)        | 119 (26.3%) |          |    |             |
| Television sets                                                | 162 (37.7%)       | 13(59.1%)        | 175 (38.7%) |          |    |             |
| Radio (Tape recorder)                                          | 113 (26.3%)       | 3(13.6%)         | 116(25.7%)  |          |    |             |
| Others (laptops, phones, Ipad)                                 | 6 (1.4%)          | 0 (0.0%)         | 6 (1.3%)    |          |    |             |
| <b>15. What types of ICT do you have access to?</b>            |                   |                  |             |          |    |             |
| Computer                                                       | 340 (79.1%)       | 21(95.5%)        | 361 (79.9%) | 18.096   |    | 0.20        |
| E-mail                                                         | 277 (64.4%)       | 21(95.5%)        | 298 (65.9%) |          |    |             |
| Internet                                                       | 355 (82.6%)       | 20(90.9%)        | 375 (83.0%) |          |    |             |
| Digital camera                                                 | 127 (29.5%)       | 8 (36.4%)        | 135 (29.9%) |          |    |             |
| Scanner                                                        | 112 (26.0%)       | 6(27.3%)         | 118(26.1%)  |          |    |             |
| Video                                                          | 92(21.4%)         | 3(13.6%)         | 95(21.0%)   |          |    |             |
| Data projector                                                 | 91(21.2%)         | 11(50.0%)        | 102 (22.6%) |          |    |             |
| Slides                                                         | 81(18.8%)         | 5 (27%)          | 86(19.0%)   |          |    |             |
| Film strips                                                    | 51(11.9%)         | 0 (0.0%)         | 51(11.3%)   |          |    |             |
| Electronic notice boards                                       | 57(13.3%)         | 1(4.5%)          | 58 (12.8%)  |          |    |             |
| Disc player                                                    | 103 (24.0%)       | 3(13.6%)         | 106(23.5%)  |          |    |             |
| Bulletin boards                                                | 126 (29.3%)       | 8 (36.4%)        | 134 (29.6%) |          |    |             |
| Television sets                                                | 213(49.5%)        | 11(50.0%)        | 224(49.6%)  |          |    |             |
| Radio(Tape recorder                                            | 161 (37.4%)       | 4 (18.2%)        | 165 (36.5%) |          |    |             |
| Others (phone, laptops, projectors)                            | 6(1.4%)           | 0(0.0%)          | 6(1.3%)     |          |    |             |

|                                                                                     |             |            |              |       |   |       |
|-------------------------------------------------------------------------------------|-------------|------------|--------------|-------|---|-------|
| <b>16. Do you possess a computer?</b>                                               |             |            |              |       |   |       |
| Yes                                                                                 | 307(71.4%)  | 21(95.5%)  | 328(72.6%)   | 6.086 | 1 | 0.01* |
| No                                                                                  | 123(28.6%)  | 1(4.5%)    | 124(27.4%)   |       |   |       |
| <b>17. If 'yes', what type of computer do you have?</b>                             |             |            |              |       |   |       |
| Desktop                                                                             | 29 (9.4%)   | 4(19.0%)   | 33 (7.3%)    |       |   |       |
| Laptop                                                                              | 249(81.1%)  | 21(100%)   | 270(59.7%)   | 3.439 |   | 0.33  |
| Palmtop                                                                             | 51(16.6%)   | 1(4.8%)    | 52(11.5%)    |       |   |       |
| Others (phone, Ipad)                                                                | 13(4.2%)    | 1(4.8%)    | 14(3.1%)     |       |   |       |
| <b>18.If ' yes', are you linked to the Internet?</b>                                |             |            |              |       |   |       |
| Yes                                                                                 | 240 (78.2%) | 20(95.2%)  | 260 (79.3%)  | 3.482 | 1 | 0.06  |
| No                                                                                  | 67 (21.8%)  | 1(4.8%)    | 68 (20.7%)   |       |   |       |
| <b>19.If 'no, where do you access ICT services?</b>                                 |             |            |              |       |   |       |
| Commercial                                                                          | 100 (81.3%) | 1 (100%)   | 101 (81 .5%) |       |   |       |
| Cyber Café                                                                          |             |            |              |       |   |       |
| University Library                                                                  | 5 (4.1%)    | 0 (0.0%)   | 334 (73.9%)  | 0.230 | 3 | 0.97  |
| University Hostel                                                                   | 10(8.1%)    | 0(0,0%)    | 10(8.1%)     |       |   |       |
| Home                                                                                | 8 (6.5%)    | 0 (0.0%)   | 8 (6.5%)     |       |   |       |
| <b>20.Are computers available to students in your institutions?</b>                 |             |            |              |       |   |       |
| Yes                                                                                 | 135 (31.4%) | 10(45.5%)  | 145(32.1%)   | 1,899 | 1 | 0.17  |
| No                                                                                  | 295 (68.6%) | 12 (54.5%) | 307 (67.9%)  |       |   |       |
| <b>21.What factors do you think that affect access to ICT in your institutions?</b> |             |            |              |       |   |       |
| High cost of ICT                                                                    | 267(62.1%)  | 14(63.6%)  | 281 (62.2%)  |       |   |       |
| Irregular power supply                                                              | 211(49.1%)  | 21(95.5%)  | 232(51.3%)   |       |   |       |
| Security challenges                                                                 | 163 (37.9%) | 6(27.3%)   | 169 (37.4%)  | 7.923 |   | 0.24  |
| Long distance                                                                       | 110 (25.6%) | 5 (22.7%)  | 115 (25.4%)  |       |   |       |
| Insufficient space                                                                  | 108 (25.1%) | 7(31.8%)   | 115 (25.4%)  |       |   |       |
| Time factor                                                                         | 182(42.3%)  | 10(45.5%)  | 192(42.5%)   |       |   |       |
| Computer illiteracy                                                                 | 153 (35.6%) | 13(59.1%)  | 166 (36.7%)  |       |   |       |

\*Responses not exclusive.

The results on Table 7 show the responses on availability and accessibility of ICT to students and teachers. The first three types of ICT that are available in their institutions were internet 365 (80.8%), computer 334 (73.9%), and E-mail 265 (58.6%). Film strips 70 (15.5%) and electronic notice boards 74 (16.4%) were the two least types of ICT that are available in their institutions. This is not significant between the students and the lecturers ( $P>0.05$ ). The first three types of ICT that the respondents have access to internet 375 (83.0%), computer 361 (79.9%) and E-mail 298 (65.9%). Film strips 51(11.3%) and electronic notice boards 74 (16.4%) were the two least types of ICT that the respondents had access to, this also is not significant between the students and the lecturers ( $P>0, 05$ ). Majority 328(72.6%) of the respondents possess computers, all lecturers except one 21 (95.5%) possess computers, while 340(71.4%) of the students possess computers. This difference is significant ( $P<0.05$ ). Among the 307 students that possess computers, 8 1.1% of them had laptops while among the 21 lecturers that possess computers, all of them (100%) had laptops; this difference is not significant ( $P>0.05$ ). Almost all the lecturers 20 (95.2%) had a link to the Internet while majority of students 240 (78.2%) had link to the Internet, but the difference is not significant ( $P>0.05$ ). Most 100(81.3%) of the respondents that did not have access to internet, access ICT in commercial cyber café. Most of the students and teachers 307(67.9%) confirmed that computers were not available to students in their institutions majorly because of high cost of ICT 281(62.2%).

**Objective 3: to determine students' and teachers' use of ICT**

To realize this objective, questions 22 ñ 33 in the questionnaire were used. The data collected were analyzed using frequencies and percentages. The results are presented in Table 8 and 9 .

**Table 8: Students' and Teachers' use of ICT**  
**n = 452**

| Items                                                        | Students<br>n=430 | Lecturers<br>n=22 | Total      | x <sup>2</sup> | df | P-value       |
|--------------------------------------------------------------|-------------------|-------------------|------------|----------------|----|---------------|
| <b>22. What activities do you perform with ICT/Computer?</b> |                   |                   |            |                |    |               |
| Skill acquisition                                            | 169(39.3%)        | 7(31.8%)          | 176(38.9%) |                |    |               |
| Data processing                                              | 185(43.0%)        | 11(50.0%)         | 196(43.4%) |                |    |               |
| Academic presentation                                        | 243(56.5%)        | 18(81.8%)         | 261(57.7%) |                |    |               |
| Drawing                                                      | 84(19.5%)         | 2(9.1%)           | 86(19.0%)  |                |    |               |
| Design                                                       | 103(24.0%)        | 2(9.1%)           | 105(23.2%) |                |    |               |
| Networking/ Linking with peers                               | 177(41.2%)        | 10(45.5%)         | 187(41.4%) |                |    |               |
| P laying games                                               | 229(53.3%)        | 3(13.6%)          | 232(51.3%) |                |    |               |
| Watching films                                               | 260<br>(60.5%)    | 3(13.6%)          | 263(58.2%) | <b>93.380</b>  |    | <b>0.000*</b> |
| Playing music                                                | 225(52.3%)        | 8(36.4%)          | 233(51.5%) |                |    |               |
| Data/Records management                                      | 30(7.0%)          | 8(36.4%)          | 38(8.4%)   |                |    |               |
| Collaboration with colleagues                                | 22(5.1%)          | 7(31.8%)          | 29(6.4%)   |                |    |               |
| Accessing academic information                               | 203(47.2%)        | 16(72.7%)         | 219(48.5%) |                |    |               |
| News                                                         | 247(57.4%)        | 12(54.5%)         | 259(57.3%) |                |    |               |
| Research                                                     | 261(60.7%)        | 16(72.7%)         | 277(61.3%) |                |    |               |
| Computation/Calculation                                      | 206(47.9%)        | 15(68.2%)         | 221(48.9%) |                |    |               |
| Academic purposes                                            | 195(45.3%)        | 16(72.7%)         | 211(46.7%) |                |    |               |
| Teaching/ Instruction                                        | 40(9.3%)          | 11(50.0%)         | 51(11.3%)  |                |    |               |

**23. How often do you use****ICT/ Computer?**

|                        |                |           |             |       |   |       |
|------------------------|----------------|-----------|-------------|-------|---|-------|
| Daily                  | 150(34.9%)     | 12(54.5%) | 162 (35.8%) |       |   |       |
| Several days in a week | 139<br>(32.3%) | 9 (40.9%) | 148(32.7%)  |       |   |       |
| Once a week            | 36(8.4%)       | 0(0.0%)   | 148(32.7%)  | 8.187 | 4 | 0.085 |
| Rarely                 | 72(16.7%)      | 1(4.5%)   | 73(16.2%)   |       |   |       |
| Not at all             | 33 (7.7%)      | 0(0.0%)   | 33 (7.3%)   |       |   |       |

**24.What type of  
computer software do  
you  
often use?**

|                             |                |           |             |        |  |        |
|-----------------------------|----------------|-----------|-------------|--------|--|--------|
| Microsoft Word              | 331<br>(77.0%) | 21(95.5%) | 352(77.9%)  |        |  |        |
| Microsoft Access            | 68(15.8%)      | 4(18.2%)  | 72(15.9%)   |        |  |        |
| Microsoft PowerPoint        | 100(23.3%)     | 18(81.8%) | 118(26.1%)  |        |  |        |
| Microsoft Excel             | 78(18.1%)      | 5 (22.7%) | 83(18.4%)   | 18.686 |  | 0.005* |
| Corel Draw                  | 67(15.6%)      | 3 (13.6%) | 70(15.5%)   |        |  |        |
| Games Education software    | 98 (22.8%)     | 3(13.6%)  | 101 (22.3%) |        |  |        |
| Others (Internet, Chatting) | 18(4.2%)       | 0(0.0%)   | 18(4.0%)    |        |  |        |

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**\*Responses not exclusive**

| Use of ICT                                                        | Students       | Lecturers     | Total          | $\chi^2$ | df | P-value |
|-------------------------------------------------------------------|----------------|---------------|----------------|----------|----|---------|
| <b>25.How often do you use ICT/Computer for academic purpose?</b> |                |               |                |          |    |         |
| Daily                                                             | 129<br>(30.0%) | 9 (40.9%)     | 138<br>(30.5%) | 3.756    | 5  | 0.585   |
| Several days in a week                                            | 154<br>(35.8%) | 9 (40.9%)     | 163<br>(36.1%) |          |    |         |
| Once a week                                                       | 29 (6.7%)      | 1 (4.5%)      | 30 (6.6%)      |          |    |         |
| Several days in a month                                           | 60 (14.0%)     | 1 (4.5%)      | 61(13.5%)      |          |    |         |
| Rarely                                                            | 34 (7.9%)      | 2 (9.1%)      | 36 (8.0%)      |          |    |         |
| Not at all                                                        | 24 (5.6%)      | 0 (0.0%)      | 24 (5.3%)      |          |    |         |
| <b>What is your difficulty level in using a computer?</b>         |                |               |                |          |    |         |
| Very easy                                                         | 91(21.2%)      | 4(18.2%)      | 95(21.0%)      | 7.321    |    | 0.062   |
| Easy                                                              | 243<br>(56.5%) | 18<br>(81.8%) | 261<br>(57.7%) |          |    |         |
| Difficult                                                         | 62 (14.4%)     | 0 (0.0%)      | 62<br>(13.7%)  |          |    |         |
| Very difficult                                                    | 34 (7.9%)      | 0 (0.0%)      | 34 (7.5%)      |          |    |         |
| <b>26.What internet activities do you engage in?</b>              |                |               |                |          |    |         |
| Browsing                                                          | 386<br>(89.8%) | 22 (100%)     | 408<br>(90.3%) | 15.507   |    | 0.003*  |
| Scanning journals                                                 | 99(23.0%)      | 14(63.6%)     | 113<br>(25.0%) |          |    |         |
| Downloading articles                                              | 255<br>(59.3%) | 18<br>(81.8%) | 273<br>(60.4%) |          |    |         |
| Internet surfing                                                  | 180<br>(41.9%) | 7 (31.8%)     | 187<br>(41.4%) |          |    |         |
| E-mail                                                            | 262<br>(60.9%) | 20<br>(90.9%) | 282<br>(62.4%) |          |    |         |

|                            |                |           |                |
|----------------------------|----------------|-----------|----------------|
| Chatting with friends      | 274<br>(63.7%) | 6 (27.3%) | 280<br>(61.9%) |
| Playing music              | 222<br>(51.6%) | 8 (36.4%) | 230<br>(50.9%) |
| News                       | 200<br>(46.5%) | 9 (40.9%) | 209<br>(46.2%) |
| Others (Videos, Game, etc) | 8 (1.9%)       | 0 (0.0%)  | 8 (1.8%)       |

**27. What search engine(s) do you often use?**

|                                       |                |               |                |        |        |
|---------------------------------------|----------------|---------------|----------------|--------|--------|
| Yahoo                                 | 261<br>(60.7%) | 18(81.8%)     | 279<br>(61.7%) | 16.033 | 0.007* |
| Google                                | 393<br>(91.4%) | 20<br>(90.9%) | 413<br>(91.4%) |        |        |
| MSN Hot mail                          | 41(9.5%)       | 3(13.6%)      | 44(9.7%)       |        |        |
| Ask Jeeves                            | 24 (5.6%)      | 2 (9.1%)      | 26(5.8%)       |        |        |
| Devil finders                         | 3 (0.7%)       | 2 (9.1%)      | 5 (1.1%)       |        |        |
| Others (Mozilla, G-mail, Chrome, etc) | 27 (6.3%)      | 5 (22.7%)     | 32 (7.1%)      |        |        |

| Use of ICT                                                               | Students    | Teachers   | Total       | $\chi^2$ | df | P-value |
|--------------------------------------------------------------------------|-------------|------------|-------------|----------|----|---------|
| <b>28. How often do you use internet for browsing for academic work?</b> |             |            |             |          |    |         |
| Daily                                                                    | 130 (30.2%) | 10 (45.5%) | 140 (31.0%) | 4.394    | 5  | 0.494   |
| Several days in a week                                                   | 167 (38.8%) | 9 (40.9%)  | 176 (38.9%) |          |    |         |
| Once a week                                                              | 26 (6.0%)   | (0.0%)     | 26 (5.8%)   |          |    |         |
| Several days in a month                                                  | 60 (14.0%)  | 1 (4.5%)   | 61 (13.5%)  |          |    |         |
| Rarely                                                                   | 27 (6.3%)   | 1(4.5%)    | 28 (6.2%)   |          |    |         |
| Not at all                                                               | 20 (4.7%)   | 1(4.5%)    | 21(4.6%)    |          |    |         |

**29. What is your difficulty level in using internet?**

|                |             |            |             |       |       |
|----------------|-------------|------------|-------------|-------|-------|
| Very easy      | 121 (28.1%) | 5 (22.7%)  | 126 (27.9%) | 0.938 | 0.816 |
| Easy           | 225 (52.3%) | 13 (59.1%) | 238 (52.7%) |       |       |
| Difficult      | 57 (13.3%)  | 2(9.1%)    | 59 (13.1%)  |       |       |
| Very difficult | 27 (6.3%)   | 2 (9.1%)   | 29 (6.4%)   |       |       |

**30. Do you require any assistance while using a computer/ internet?**

|     |             |            |             |       |   |       |
|-----|-------------|------------|-------------|-------|---|-------|
| Yes | 180(41.9%)  | 7 (31.8%)  | 187 (41.4%) | 0.870 | 1 | 0.351 |
| No  | 250 (58,1%) | 15 (68.2%) | 265 (58.6%) |       |   |       |

**31. Which ICT skill listed below do you perceive yourself confident in performing?**

|                                                           |             |            |             |       |       |
|-----------------------------------------------------------|-------------|------------|-------------|-------|-------|
| Word processing                                           | 258 (60.0%) | 22 (100%)  | 280 (61.9%) | 5.834 | 0.442 |
| Printing a document                                       | 172 (40.0%) | 19 (86.4%) | 191 (42.3%) |       |       |
| PowerPoint presentation                                   | 127 (29.5%) | 20 (90.9%) | 147 (32.5%) |       |       |
| Adobe Acrobat                                             | 95(22.1%)   | 11(50.0%)  | 106(23.5%)  |       |       |
| Downloading materials                                     | 230 (53.5%) | 21(95.5%)  | 251 (55.5%) |       |       |
| Accessing information from CD ROM, DVD, Flash drives, etc | 120 (27.9%) | 16 (72.7%) | 136 (30.1%) |       |       |
| Others (Browsing, Playing game, etc)                      | 9 (2.1%)    | 0 (0.0%)   | 9 (2.0%)    |       |       |

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**\*Responses not exclusive**

Result on Table 8 shows the respondents' view on activities performed with ICT/Computer. There exists a significant response on the activities performed with ICT/Computer between students and lecturers ( $P < 0.05$ ). The first three highest activities performed with ICT/Computer by the students were: watching films 260(60.5%), academic presentation 243(56.5%) and playing games 229(53.3%); while the first four highest activities performed with ICT/Computer by the lecturers were: academic presentation 18(81.8%), assessing academic information 16(72.7%), research 16(72.7%), and academic purposes 16(72.7%). Regarding how often the respondents use ICT/computer is independent of the students and teachers ( $P > 0.05$ ), but most 162(35.8%) use ICT/computer daily and/or several days in a week 148(32.7%).

The type of the computer software the respondents often use is dependent on the students and the lecturers ( $P < 0.05$ ). Both the students and teachers mostly used Microsoft Word 352(77.9%) and Microsoft PowerPoint 118(26.1%). In addition, the students use more of Games/Education software 98(22.8%) and others like internet and chatting 18(4.2%). On how often they use ICT/computer for academic purpose is independent of the students and teachers ( $P > 0.05$ ) but they mostly use it several days in a week 163(36.1%) and daily 138(30.5%). The level of difficulty in using a computer is independent of the students and the lecturers ( $P > 0.05$ ); but they both mostly have it easy 261(57.7%).

The internet activities they engage in ICT is dependent on the students and the lecturers ( $P < 0.05$ ). Most students engaged in browsing 386(89.8%), chatting with friends 274(63.7%) and E-mail 262(60.9%); while all the lecturers engaged in browsing 22(100%), and most of them engaged in E-mail 20(90.9%) and downloading articles 18(81.8%). The search engine commonly used is

dependent on the students and the lecturers ( $P < 0.05$ ). Both of them mostly use Google 413(91.4%) and Yahoo 279(61.7%), but the lecturers use Devil finders 2(9.1%) than the students 3(0.7%). On how often they use internet for academic work is independent of the students and teachers ( $P > 0.05$ ) but they mostly use it daily 140(31.0%) and/or several days in a week 178(38.9%).

The level of difficulty in using internet is independent of the students and the lecturers ( $P > 0.05$ ); but they both mostly have it easy 238(52.7%). Most of the respondents 565(58.6%) did not require any assistance while using a computer/internet and this is independent of students and lecturers ( $P > 0.05$ ). The ICT skill that the respondents perceived they are confident in performing is independent of the students and lecturers ( $P > 0.05$ ), but most students were more confident in performing word processing 258(60.0%) and downloading materials 230(55.5%); while all the lecturers were confidence in word processing 22(100%) and almost all of them are confident in downloading materials 21(95.5%) and PowerPoint presentation 20(90.9%).

**Objective 4: To determine respondents' perceived factors affecting the use of ICT**

**Table 9: Respondents' perceived factors affecting the use of**  
n=452

| Items                                                                                     | Students<br>n=430 | Lecturers<br>n=22 | Total       | $\chi^2$ | P-value |
|-------------------------------------------------------------------------------------------|-------------------|-------------------|-------------|----------|---------|
| <b>32.What factor(s) do you think that constrain ICT use?</b>                             |                   |                   |             |          |         |
| Lack of expertise with ICT                                                                | 305 (70.9%)       | 17 (77.3%)        | 322 (71.2%) |          |         |
| Lack of confidence in using ICT                                                           | 240 (55.8%)       | 16 (72.7%)        | 256 (56.6%) |          |         |
| Insufficient knowledge of appropriate software                                            | 294 (68.4%)       | 20 (90.9%)        | 314 (69.5%) |          |         |
| Insufficient knowledge on how to use ICT equipment/computer                               | 249 (57.9%)       | 15 (68.2%)        | 264 (58.4%) |          |         |
| High cost of airtime                                                                      | 272 (63.3%)       | 9 (40.9%)         | 281 (62.2%) |          |         |
| High cost of ICT facilities and services                                                  | 247 (57.4%)       | 12 (54.5%)        | 259 (57.3%) |          |         |
| Irregular power supply                                                                    | 238 (55.3%)       | 20 (90.9%)        | 258 (57.1%) |          |         |
| Occupation                                                                                | 177 (41.2%)       | 6 (27.3%)         | 183 (40.5%) |          |         |
| Poor/Lack of training                                                                     | 235 (54.7%)       | 12 (54.5%)        | 247 (54.6%) | 13.539   | 0.485   |
| Lack of knowledge on how to evaluate the use and the role played by ICT teaching/learning | 142 (33.0%)       | 8 (36.4%)         | 150 (33.2%) |          |         |
| Lack of inclusion of ICT in teaching and learning                                         | 196 (45.6%)       | 10 (45.5%)        | 206 (45.6%) |          |         |
| Constant breakdown of equipments                                                          | 189 (44.0%)       | 13 (59.1%)        | 202 (44.7%) |          |         |
| Security/Privacy issues                                                                   | 226 (52.6%)       | 10 (45.5%)        | 236 (52.2%) |          |         |
| Inadequate access to ICT facilities                                                       | 175 (40.7%)       | 16 (72.7%)        | 191 (42.3%) |          |         |

|                                                                                                                                           |         |         |        |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|--------|
| Others (financial problem, incompetent leaders in an institution, poor attitude of computer science lecturer, age or generation gap, etc) | 7(1.6%) | 1(4.5%) | 80.8%) |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|--------|

**33. What measures do you think will be taken to enhance ICT use?**

|                                                                                                                                             |             |            |             |       |       |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-------------|-------|-------|
| Adequate power supply                                                                                                                       | 331 (77.0%) | 20 (90.9%) | 351 (77.7%) |       |       |
| Provision of enough ICT equipment services                                                                                                  | 357 (83.0%) | 21(95.5%)  | 378 (83.6%) |       |       |
| Organizing ICT training regularly for teachers and students                                                                                 | 329 (76.5%) | 21(95.5%)  | 350 (77.4%) | 2.614 | 0.918 |
| Implementing an effective educational information system                                                                                    | 295 (68.6%) | 12 (54.5%) | 307 (67.9%) |       |       |
| Facilitating easy access to internet services                                                                                               | 314 (73.0%) | 20 (90.9%) | 334 (73.9%) |       |       |
| Proper maintenance of ICT equipments in the university                                                                                      | 308 (71.6%) | 17 (77.3%) | 325 (71.9%) |       |       |
| Free access to on-line research and academic journals                                                                                       | 307 (71.4%) | 21(95.5%)  | 328 (72.6%) |       |       |
| Others (make personal computer compulsory for all students, provide computer to all students at reduced price, reduce cost of ICT use, etc) | 10 (2.3%)   | 1 (4.5%)   | 11(2.4%)    |       |       |

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**\*Responses not exclusive**

The results on Table 9 shows the respondents' perceived factors affecting the use of ICT. On the factors that are mostly thought to constraint ICT use, they are not significant between the students and lecturers ( $P > 0.05$ ). Although most students considered lack of expertise with ICT 305(70.9%), insufficient knowledge of appropriate software 294(68.2%), high cost of airtime 272(63.3%), insufficient knowledge on how to use ICT equipment/ computer 249(57.9%), high cost of ICT facilities and services 247(57.4%), and lack of confidence in using ICT 240(55.8%). The lecturers on the other hand mostly considered insufficient knowledge of appropriate software 20(90.9%), irregular power supply 20(90.9%), lack of expertise with ICT 17(77.3%), lack of confidence in using ICT 16(72.7%), inadequate access to ICT facilities 16(72.7%), and insufficient knowledge on how to use ICT equipment/ computer 15(68.2%). The measures thought to be taken to enhance ICT use is independent of students and lecturers ( $P > 0.05$ ). These are mostly provision of enough ICT equipment/services 378(83.6%), adequate power supply 351(77.7%), organizing ICT training regularly for teachers and students 350(77.4%), and facilitating easy access to internet services 334(73.9%).

### Test of Hypotheses

**Hypothesis 1: There is no significant difference in the knowledge of ICT between the students and the teachers.**

To test this hypothesis, the raw scores generated from question 8 in the questionnaire were subjected to Pearson's Chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 10.

**Table 10: Result of Pearson's Chi square ( $\chi^2$ ) on students' and teachers' knowledge of ICT.**

| Knowledge of ICT                                          | Students       | Teachers      | Total          | $\chi^2$      | df | P-value   |
|-----------------------------------------------------------|----------------|---------------|----------------|---------------|----|-----------|
| Have you received any form of training or exposed on ICT? |                |               |                |               |    |           |
| Yes                                                       | 346<br>(80.5%) | 20<br>(90.9%) | 366<br>(81.0%) | 1.482         | 1  | 0.223     |
| No                                                        | 84<br>(19.5%)  | 2 (9.1%)      | 86<br>(19.0%)  | 430<br>(100%) |    | 22 (100%) |
| <b>Total</b>                                              | 452<br>(100%)  |               |                |               |    |           |

Findings in Table 10 above, shows that there is no significant positive correlation between students' and teachers' knowledge of ICT ( $P > 0.05$ ). . Although the teachers 20(90.9%) seemed to have received training on or exposure to ICT more than the students 346(80.5%); it is not statistically significant. This implies that there is no significant difference in the knowledge of ICT between students and teachers. The null hypothesis is therefore accepted ( $P > 0.05$ ).

**Hypothesis 2: There is no significant difference in the types of ICT used at different study levels among students.**

To test this hypothesis, the raw scores generated from question 16 in the questionnaire were subjected to Pearson's Chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 11.

**Table 11: Result of Pearson's Chi square ( $\chi^2$ ) on the use of different ICT types at different study levels among students.**

| Knowledge of ICT                                | 200 Level | 300 Level | 400 Level  | 500 Level | $\chi^2$ | P-value |
|-------------------------------------------------|-----------|-----------|------------|-----------|----------|---------|
| <b>What types of ICT do you have access to?</b> |           |           |            |           |          |         |
| Computer                                        | 68(73.1%) | 97(81.5%) | 86(74.8%)  | 89(86.4%) |          |         |
| E-mail                                          | 48(51.6%) | 80(67.2%) | 75(65.2%)  | 74(71.8%) |          |         |
| Internet                                        | 71(76.3%) | 98(82.4%) | 100(87.0%) | 86(83.5%) |          |         |
| Digital camera                                  | 30(32.3%) | 38(31.9%) | 27(23.5%)  | 32(31.1%) |          |         |
| Scanner                                         | 20(21.5%) | 34(28.6%) | 28(24.3%)  | 30(29.1%) |          |         |
| Video                                           | 19(20.4%) | 27(22.7%) | 23(20.0%)  | 23(22.3%) |          |         |
| Data projector                                  | 18(19.4%) | 26(21.8%) | 19(16.5%)  | 28(27.2%) | 25.453   | 0.979   |
| Slides                                          | 16(17.2%) | 25(21.0%) | 15(13.0%)  | 25(24.3%) |          |         |
| Filmstrips                                      | 13(14.0%) | 17(14.3%) | 15(13.0%)  | 6(5.8%)   |          |         |
| Electronic notice boards                        | 13(14.0%) | 20(16.8%) | 9(7.8%)    | 15(14.6%) |          |         |
| Disc player                                     | 23(24.7%) | 32(26.9%) | 27(23.5%)  | 21(20.4%) |          |         |
| Bulletin boards                                 | 24(25.8%) | 41(34.5%) | 31(27.0%)  | 30(29.1%) |          |         |
| Television sets                                 | 46(49.2%) | 60(50.4%) | 60(52.2%)  | 47(45.6%) |          |         |
| Radio (Tape recorder)                           | 31(33.3%) | 50(42.0%) | 42(36.5%)  | 38(36.9%) |          |         |
| Others (phone, laptops, projectors)             | 3(3.2%)   | 2(1.7%)   | 0(0.0%)    | 1(1.0%)   |          |         |

The result as presented on Table 11 shows no statistical difference in the types of ICT used at different study levels among students. This means that there is no difference in the types of ICT used at different study levels, namely; 200 level, 300 level, 400 level and 500 level respectively, although from the result of data generated; 500 level students tends to use more of "Computer" and "E-mail" than the rest of the students but this difference is not statistically significant. The null hypothesis is therefore accepted ( $P>0.05\%$ ).

**Hypothesis 3: There is no significant difference in the preferred ICT types among male and female students.**

To test this hypothesis, the raw scores generated from question 16 in the questionnaire were subjected to Pearson's Chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 12.

**Table 12: Result of Pearson's Chi square ( $\chi^2$ ) on preferred ICT types among male and female students.**

| Types of ICT                            | Female     | Male      | $\chi^2$ df | P-value |
|-----------------------------------------|------------|-----------|-------------|---------|
| <b>What types of ICT do you access?</b> |            |           |             |         |
| Computer                                | 300(81.5%) | 61(72.6%) | 6.207       | 0.961   |
| E-mail                                  | 249(67.7%) | 49(58.3%) |             |         |
| Internet                                | 307(83.4%) | 68(81.0%) |             |         |
| Digital camera                          | 109(29.6%) | 26(31.0%) |             |         |
| Scanner                                 | 95(25.8%)  | 23(27.4%) |             |         |
| Video                                   | 76(20.7%)  | 19(22.6%) |             |         |
| Data projector                          | 81(22.0%)  | 21(25.0%) |             |         |
| Slides                                  | 68(18.5%)  | 18(21.4%) |             |         |
| Film strips                             | 39(10.6%)  | 12(14.3%) |             |         |
| Electronic notice boards                | 49(13.3%)  | 9(10.7%)  |             |         |
| Disc player                             | 81(22.0%)  | 25(29.8%) |             |         |
| Bulletin boards                         | 112(30.4%) | 22(26.2%) |             |         |
| Television sets                         | 179(48.6%) | 45(53.6%) |             |         |
| Radio (Tape recorder)                   | 133(36.1%) | 32(61.9%) |             |         |
| Others (phone, laptops, projectors)     | 5(1.4%)    | 1(1.2%)   |             |         |

The result as presented on Table 12 shows no statistical significant difference in the preferred ICT types between male and female students. This means that there is no difference in the preferred ICT types between male and female students, although from the result; female students seem to prefer "Computer" and "E-mail" while male students seem to prefer "Radio" and "Tape recorder" but this is not statistically significant. The null hypothesis is therefore accepted since ( $P > 0.05$ ).

**Hypothesis 4: There is no significant difference in the access of ICT among students and teachers.**

To test this hypothesis, the raw scores generated from question 16 in the questionnaire were subjected to Pearson's chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 13.

**Table 13: Result of Pearson's Chi square ( $\chi^2$ ) on the access to ICT between students and teachers.**

| Access to ICT                                   | Students    | Lecturers  | Total       | $\chi^2$ | P-value |
|-------------------------------------------------|-------------|------------|-------------|----------|---------|
| <b>What types of ICT do you have access to?</b> |             |            |             |          |         |
| Computer                                        | 340(79.1%)  | 21 (95.5%) | 361 (79.9%) | 18.096   | 0.202   |
| E-mail                                          | 277 (64.4%) | 21(95.5%)  | 298 (65.9%) |          |         |
| Internet                                        | 355 (82.6%) | 20 (90.9%) | 375 (83.0%) |          |         |
| Digital camera                                  | 127 (29.5%) | 8 (36.4%)  | 135 (29.9%) |          |         |
| Scanner                                         | 112 (26.0%) | 6(27.3%)   | 118 (26.1%) |          |         |
| Video                                           | 92 (21.4%)  | 3 (13.6%)  | 95 (21.0%)  |          |         |
| Data projector                                  | 91(21.2%)   | 11(50.0%)  | 102(22.6%)  |          |         |
| Slides                                          | 81(18.8%)   | 5 (22.7%)  | 86 (19.0%)  |          |         |
| Film strips                                     | 51(11.9%)   | 0(0.0%)    | 51(11,3%)   |          |         |
| Electronic notice boards                        | 57(13.3%)   | 1(4.5%)    | 58(12.8%)   |          |         |
| Disc player                                     | 103 (24.0%) | 3 (13.6%)  | 106 (23.5%) |          |         |
| Bulletin boards                                 | 126 (29.3%) | 8 (36.4%)  | 134 (29.6%) |          |         |
| Television sets                                 | 213 (49.5%) | 11(50.0%)  | 224 (49.6%) |          |         |
| Radio (Tape recorder)                           | 161 (37.4%) | 4(18.2%)   | 165 (36.5%) |          |         |
| Others (phone, laptops, projectors)             | 6 (1.4%)    | 0 (0.0%)   | 6 (1.3%)    |          |         |

The result as presented on Table 13 shows no statistical significant difference in the access to ICT between students and teachers. This means that there is no difference in the access to ICT between students and teachers; although from the result teachers seem to have more access to ICT than students but the difference is not statistically significant. The null hypothesis is therefore accepted ( $P > 0.05$ ).

**Hypothesis 5: There is no significant difference in the students and teachers constraints associated with ICT between the students and teachers.**

To test this hypothesis, the raw scores generated from question 33 in the questionnaire were subjected to Pearson's chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 14.

**Table 14: Result of Pearson's chi square ( $\chi^2$ ) on the constraints associated with ICT use among students and teachers**

| Factors affecting Use of ICT                                                                                                              | Students    | Lecturers  | Total       | $\chi^2$ | P-Value |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------|------------|-------------|----------|---------|
| <b>What factor(s) do you think that Constrain ICT and use in your institution?</b>                                                        |             |            |             |          |         |
| Lack of expertise with ICT                                                                                                                | 305 (70.9%) | 17(77.3%)  | 322 (71.2%) | 13.539   | 0.485   |
| Lack of confidence in using ICT                                                                                                           | 240 (55.8%) | 16 (72.7%) | 256 (56.6%) |          |         |
| Insufficient knowledge of appropriate software                                                                                            | 294 (68.4%) | 20 (90.9%) | 314 (69.5%) |          |         |
| Insufficient knowledge on how to use ICT equipment! Computer                                                                              | 249 (57.9%) | 15 (68.2%) | 264 (58.4%) |          |         |
| High cost of airtime                                                                                                                      | 272(63.3%)  | 9(40.9%)   | 281 (62.2%) |          |         |
| High cost of ICT facilities and services                                                                                                  | 247 (57.4%) | 12 (54.5%) | 259 (57.3%) |          |         |
| Irregular power supply                                                                                                                    | 238 (55.3%) | 20 (90.9%) | 258 (57.1%) |          |         |
| Occupation                                                                                                                                | 177 (41.2%) | 6 (27.3%)  | 183 (40.5%) |          |         |
| Poor/ Lack of training                                                                                                                    | 235 (54.7%) | 12 (54.5%) | 247 (54.6%) |          |         |
| Lack of knowledge on how to evaluate the use and the role played by ICT teaching/ Learning                                                | 142 (33.0%) | 8 (36.4%)  | 150 (33.2%) |          |         |
| Lack of inclusion of ICT in teaching and learning                                                                                         | 196 (45.6%) | 10 (45.5%) | 206 (45.6%) |          |         |
| Constant breakdown of equipments                                                                                                          | 189 (44.0%) | 13 (59.1%) | 202 (44.7%) |          |         |
| Security/Privacy issues                                                                                                                   | 226 (52.6%) | 10 (45.5%) | 236 (52.2%) |          |         |
| Inadequate access to ICT facilities                                                                                                       | 175 (40.7%) | 16 (72.7%) | 191 (42,3%) |          |         |
| Others (financial problem, incompetent leaders in an institution, poor attitude of computer science lecturer, age or generation gap, etc) | 7 (1.6%)    | 1 4.5%)    | 8(1.8%)     |          |         |

The result as presented on Table 14 shows no statistical significant difference in the constraints associated with ICT use between students and teachers. This means that there is no difference in the constraints associated with ICT use between students and teachers. The null hypothesis is therefore accepted since  $P > 0.05$ .

**Hypothesis 6: There is no significant difference in the activities performed with ICT/Computer between students and teachers.**

To test this hypothesis, the raw scores generated from question 23 in the questionnaire were subjected to Pearson's Chi-square ( $\chi^2$ ) analysis at 0.05 probability level. The result of the analysis was presented on Table 15.

**Table 15: Result of Pearson's Chi square ( $\chi^2$ ) on the activities performed with ICT/Computer between students and teachers.**

| Use of ICT                                               | Students    | Lecturers  | Total       | $\chi^2$ | P-Value |
|----------------------------------------------------------|-------------|------------|-------------|----------|---------|
| <b>What activities do you perform with ICT/Computer?</b> |             |            |             |          |         |
| Skills acquisition                                       | 169 (39.3%) | 7(31.8%)   | 176(38.9%)  | 93.380   | 0.000*  |
| Data Processing                                          | 185 (43.0%) | 11(50.0%)  | 196 (43.4%) |          |         |
| Academic presentation                                    | 243 (56.5%) | 18 (81.8%) | 261 (57.7%) |          |         |
| Drawing                                                  | 84 (19.5%)  | 2 (9.1%)   | 86 (19.0%)  |          |         |
| Designing                                                | 103 (24.0%) | 2 (9.1%)   | 105 (23.2%) |          |         |
| Networking/Linking with peers                            | 177 (41.2%) | 10 (45.5%) | 187 (41.4%) |          |         |
| Playing games                                            | 229 (53.3%) | 3 (13.6%)  | 232 (51.3%) |          |         |
| Watching films                                           | 260 (60.5%) | 3 (13.6%)  | 263 (58.2%) |          |         |
| Playing music                                            | 225 (52.3%) | 8 (36.4%)  | 233 (51.5%) |          |         |
| Data/Records management                                  | 30 (7.0%)   | 8 (36.4%)  | 38 (8.4%)   |          |         |
| Collaboration with colleagues                            | 22 (5.1%)   | 7 (31.8%)  | 29(6.4%)    |          |         |
| Assessing academic information                           | 203 (47.2%) | 16 (72.7%) | 219 (48.5%) |          |         |
| News                                                     | 247 (57.4%) | 12 (54.5%) | 259 (57.3%) |          |         |
| Research                                                 | 261 (60.7%) | 16 (72.7%) | 277 (61.3%) |          |         |
| Computation/Calculation                                  | 206 (47.9%) | 15 (68.2%) | 221 (48.9%) |          |         |
| Academic purposes                                        | 195 (45.3%) | 16 (72.7%) | 211(46.7%)  |          |         |
| Teaching/Instruction                                     | 40(9.3%)    | 11(50.0%)  | 51(11.3%)   |          |         |

The result as presented on Table 15 shows a significant statistical difference in the activities performed with ICT/Computer between students and teachers. The first three(3) best opinion of the students on the activities performed with ICT are "Watching Films" 260(60.5%), "Academic presentation" 243(56.5%) and "Watching Films" 260(60.5%), "Academic presentation" 243(56.5%) and "Watching Films" 260(60.5%).

Playing Games 225(52.3%), while the first three (3) best opinion of the lecturers on the ICT activities are Academic Presentation 618(81.8%), Accessing Academic Information 16(72.7%) and Research 16(72.7%). This means that students use ICT more in Watching Films and Playing Games than teachers, while teachers use ICT more than students for Academic Presentations and Research. The null hypothesis is therefore accepted since ( $P < 0.05$ ).

### **Summary of Result**

Majority of the respondents were female and the mean age and standard deviation of the students were 25.3 ( $\pm 4.2$ ) years while that of the teachers were 47 ( $\pm 12.4$ ) years.

Majority of the students 346 (80.5%) and majority of the teachers 20(90.9%) had knowledge of ICT. Respondents had access to the following ICT: computer; students 314(73.0%), teachers 20 (90.9%), Internet; students 343(79.8%), teachers 22(100%) and e-mail; students 248(57.7%) and teachers 17(77.3%). Students performed academic activities several days in a week with ICT 154(35.8%). Teachers performed academic activities several days in a week with ICT 9(40.9%). The Internet activities mostly performed by the students were: browsing 386(89.8%), chatting with friends 274(63.7%) and e-mailing 262(60.9%). The Internet activities mostly performed by teachers were: browsing 22(100%), e-mailing 20(90.9%) and downloading articles 18(81.8%). Google is the most common search engine used by students 393(91.4%) and teachers 20(90.9%). According to the respondents, high cost of ICT 281(62.2%) and irregular power supply 258(57.1%) were major factors that affect accessibility to and use of ICT negatively. Microsoft word 352(77.9%) is computer software mostly used by the respondents. There was no significant difference ( $p > 0.05$ ) in

the types of ICT used at different study levels among students. There was no significant difference ( $p > 0.05$ ) in the accessibility to preferred ICT types among male and female students. There was no significant difference ( $p > 0.05$ ) in the access to ICT types among teachers and students. There was no significant difference ( $p > 0.05$ ) in the constraints associated with ICT use among students and teachers. There was a significant difference ( $p < 0.05$ ) in the use of ICT between students and teachers

## **CHAPTER FIVE**

### **DISCUSSION OF THE FINDINGS**

This chapter dealt with the discussion of the findings of the study, the conclusion drawn from the findings and the educational implication of the study. Recommendations based on the findings and suggestions for further research are also highlighted. Finally, limitations of the study as well as a brief summary of the entire work were presented.

#### **Discussion of major findings**

The major findings of this study are discussed in line with the research objectives and hypothesis that were formulated to guide the study.

Specifically, the findings were discussed according to the following sub-heading:

#### **Students and teachers knowledge of ICT**

Knowledge about ICT depends on if the student and teacher had any form of information received before the study. In this study, majority of the respondents had information about ICT. The respondents' major types of information were formal. The reason adduced to this may be that most of them might have been a beneficiary of the multiples of trainings often organized by the Governments, NGOs, Development Partners and Corporate Organizations (Adeosun, 2010).

The findings on the kind of ICT training received or exposed to revealed that 'Microsoft word'; 'Computer Appreciation'; 'Microsoft Excel' 'Email' and 'Internet' attracted the highest responses. The high response rate may be associated with the respondents' needs to improve their teaching and learning

needs which the above packages often as observed by (Khan et al, 2011), in their study on the use of ICT by the students.

The findings about 'benefits' or 'usefulness' of ICT revealed the first 4 highest responses are, 'using ICT makes lesson more interesting' 'using ICT proves presentation' 'using ICT makes teaching interesting' and 'using ICT improves students learning'. This agrees with the findings of (Khan et al, 2011) that ICT have great impact of learning, on their study on, use of ICT by students: A survey of faculty of Education at IUB.

### **Students' and teacher's access to ICT**

On the issue of access to ICT, majority of the respondents indicated that mostly 'internet', 'e-mail' and 'computer' are accessible in their institution. This finding disagrees with that of (Adeyinka et al, 2011) in their study: An Assessment of Secondary School Teachers' use of ICT, that it is only internet and email services that teachers did not have access to. This result indicates that ICT are available for access and that respondents have skills to access them. Concerning the factors that affect ICT access, the study showed that high cost of ICT was a major factor affecting ICT access negatively. Other factors that attracted high response rates are 'irregular power supply', 'time factor' 'Security Challenges' and 'computer illiteracy'. 'High cost of ICT' attracted the highest score. This agrees with the findings by (Olatokun et al, 2009) that high cost of ICT facilities and services is a factor that constrain RHWs' full access to ICT. 'Irregular power supply' also attracted a high response as a factor that affect ICT access. Ajayi et al, (2009) and Adeosun (2010) noted that irregular or inability to provide minimum acceptable standards of electricity services affect ICT access negatively since ICT needs other infrastructure like electricity to function.

“Computer illiteracy” as a factor that affects ICT access also revealed a high response rate as well. This finding agrees with that of (Ajayi et al., 2009) that students and teachers were to a little extent exposed to ICT, hence they have poor access to ICT.

The findings of this study also revealed that a substantial proportion of the respondents possess a computer. As regards the type of computer they possess; majority had laptops and most of them are linked to internet quite unlike the result by (Ajayi et al., 2009) that in the Schools computer and internet were not accessible to teachers.

#### **Students’ and teachers’ use of ICT.**

Findings indicated that the respondents use ICT/ Computer: daily (35.8%) and several days in a week (32.7%). The findings emphasize that less than half the respondents use ICT regularly. This is in line with the view of (Ajayi et al., 2009), who observed that there was a low level of ICT application in Schools.

Findings also showed that it is only Microsoft word 352(77.9%) that the respondents make reasonable use. This finding is not congruent with the findings made by (Olatokun et al, 2009) which showed that RHWs at UCH make reasonable use of various ICT: e-mail, internet, video conferencing and audio conferencing. Findings also revealed that ICT/computer were minimally used for academic purposes 211(46.7%). This agrees with the findings of (Ajayi et al 2009) that there was a low level of ICT application in teaching and learning in schools. The implication is that most of the teachers may still be using the old method of chalk or pen and talk, the practice which will make them lag behind on the world of ICT.

As regards, the respondents' difficulty level in using a computer, 'easy' attracted the highest score, 261(57.7%). The result showed that the respondents are confident in the use of computer. As regards with ICT skills, respondents perceived themselves confident in the 3 highest scored items which are 'Word Processing', 'Downloading materials' and 'Printing document'. The result suggests that respondents' information retrieval skills were good. This agrees with the findings made by (Khan et al, 2011) on their study, use of ICT by students; that students' information retrieval skills were good such as downloading of materials.

#### **Students and teachers perceived constraints associated with ICT**

Table 9 indicated that the 4 highest scored items on respondents' factors constraining the use of ICT are, 'Lack of expertise with ICT' (71.2%), 'Insufficient knowledge of appropriate software' (69.5%), 'high cost of airtime' (62.2%) and 'insufficient knowledge on how to use ICT' (58.4%). The findings clearly show that greater number of respondents perceive ICT knowledge as a vital tool to its use. The finding is in line with that of (Khan et al, 2011) that Nigerian teachers possess a very low knowledge of computer. 'High cost of airtime' was also seen as a constraint to ICT use by most respondents. This is a pointer to the low level of ICT use in teaching and learning in schools as indicated by the finding of (Ajayi et al., 2009) in their study, application of ICT in schools.

On the aspect of ICT availability, computers, internet and e-mail are the 3 highest ICT available in the institution. The provision of these 3 ICT in reasonable number may be owed to the government policy to make available ICT to all users and stakeholders through National Information Technology Development Agency

(NITDA) according to (Nigeria National Policy for Information Technology, 2001).

The findings also revealed that data projectors, electronic notice boards and television sets are minimally available in the institution. This agrees with the findings of (Adeosun, et al., 2011) that ICT tools and equipments are grossly lacking in almost all the sampled schools

### **Relationship between occupation and knowledge of ICT**

#### **Hypothesis 1**

One of the major findings in this study was that there was no significant difference in the knowledge of ICT between students and teachers ( $P > 0.05$ ). Findings in Table 11, on the knowledge of ICT subscale reveal that 346 (80.5%) students, 20 (90.9%) teachers. This shows that most students and teachers have knowledge of ICT but the difference is not statistically different. This finding of students/teachers good knowledge about ICT is not in consonant with the findings made by (Ajayi et al., 2009) that secondary students and teachers have poor knowledge about ICT.

### **Relationship among different study levels and types of ICT used**

#### **Hypothesis 2**

Findings reveal that there is no significant difference in the types of ICT used at different study levels ( $P > 0.05$ ). Findings in Table 12, show that the first three ICT types used by different study level are Computer 68(73.1%) 200 level, 97(81.5%) 300 level, 86(74.8%) 400 level and 89(86.4%) 500 level, e-mail 48(51.6%) 200 level, 80 (67.2%) 300 level, 75 (65.2%) 400 level and 74 (71.8%) 500 level internet 71 (78.3%) 200 level, 98(82.4%) 300 level, 100(87.6%) 400

level and 86(83.5%) 500 level. By mere observation, there is a difference but when hypothesis was tested a result of no significant difference among the 4 study levels was established. The result study could probably be attributed to the fact that there is no separate training for any of the study levels (200, 300, 400 and 500 level) respectively.

### **Relationship in the access to preferred ICT types among male and female students.**

#### **Hypothesis 3**

Findings in Table 13 show that there is no significant difference in the access to preferred ICT types among female and male students. Result of hypothesis 3 shows that the frequencies and percentages of the first three highest scored items were 'internet' 307(83.4%) Female, 68(81.0%) male, 'computer' 300(81.5%) female, 49(58.3%) male. There seen to be a mild degree of difference in the access in the first 3 ICT most preferred by the students in the reference to their gender. Further test of hypothesis established no significant difference in the access to preferred ICT types among female and male students. The result disagrees with the findings of (Olatokun et al., 2009) that male respondents access e-mail more than their female counterparts and also the findings of Women's learning partnership (2009) that males access internet more than females.

### **Relationship between students' and teachers' access to ICT types.**

#### **Hypothesis 4**

Findings in table 14 portray that there was no significant difference in the access to different ICT types between students and teachers. Result of hypothesis 4

Internet 355(82.6%) students, 20(90.9%) teachers, computer 340 (79.1%) students, 21(95.5%) teachers, e-mail 277 (64.4%) students, 21(95.5%) teachers, shows that the first 3 highest scored ICT types has no statistical difference between the two categories of occupation. The finding is not in consonant with that of (Olatokun et al., 2009) who reported that there was a variation in the degree of access among various ICT by the Reproductive Health Workers.

### **Relationship between students' and teachers' factors that constrain their ICT use**

#### **Hypothesis 5**

Findings in Table 15, revealed that there was no significant difference ( $P > 0.05$ ) in the constraints associated with ICT use between the students and the teachers. Occupation of the respondents (student or teacher) does not have influence on the type of constraints associated with ICT use. These items in Table 15 lack of expertise with ICT use 305 (70.9%) students, 17(77.3%) teachers, insufficient knowledge of appropriate software 294(68.4%) students, 20(90.9%) teachers, High cost of airtime 272(63.3%) students, 9(40.9%) teachers portrays that there is no statistical difference in the factors that constrain ICT use by the respondents. This is in line with the view of (Olatokun et al., 2009) that showed that factors that constrain full ICT exploitation by RHWs was not significantly different among various groups of reproductive health workers studied.

### **Difference between students' and teachers' opinion about ICT activities**

#### **Hypothesis 6**

Findings in Table 16, show that there is significant difference in the ICT activities between students and teachers ( $P < 0.05$ ). Result of hypothesis shows

that the first three best opinion of the students on ICT activities are 'watching films' (60.5%), academic presentation (56.5%) and playing games (53.3%) while the first three best opinion of the lecturers on ICT activities are, academic presentation (81.8%), 'assessing academic information' (72.7%), academic purposes (72.7%) and research (72.7%). This implies that teachers use ICT more on academic related activities than the students. This may be due to the demands placed on teachers in university education to either publish or stagnate. The students on the other hand engage more in activities relating to entertainment. The finding is not in congruence with that of (Nwezeh, 2010) who observed that both teachers and students used Internet extensively for academic purposes.

### **Implications of the Findings**

The findings of this study have some implications as follows:

- Sufficient ICT materials are very essential for effective and efficient use of ICT materials, as lack of these will obviously affect the use.
- If the students and teachers are adequately trained for the use of ICT, teaching and learning will be adequately conducted with ease.
- ICT materials are not adequately utilized in the core of teaching and learning in the university. ICT provides efficient and current information services. Once the staff and students are able to use these technologies effectively, the teaching, learning and research activities in the university will be made easier for the university community.
- ICT usage will facilitate development since there will be free flow of information.

### **Limitations of the study**

The conclusions and generalizations that can be made from the findings of this study are subject to some limitations.

Firstly, the present study was peculiar in the sense that no such study has been carried out in the South-East Zone of Nigeria. As a result, there was a great dearth of knowledge and literature in this area. The poor and scarce literature was compensated by some relevant literatures from other areas. This formed a major limitation for this study. The few literatures articulated formed the background for this study.

Furthermore, it was difficult to gain co-operation from some of the respondents. Some of the respondents were reluctant in co-operating with the researcher because some of them felt that the researcher was interrupting their schedule. The researcher also encountered huge financial expenses in carrying out this research.

### **Suggestion for Further Studies**

The present study has provided empirical information about knowledge, access and use of ICT among students and teachers in university nursing education. This study opens up avenue to some other areas that could be investigated in order to improve ICT knowledge, access and use in nursing education. However, it is not all that appropriate to make definite conclusion on only a single study of this kind, putting into consideration the possible shortcomings of this study. There is therefore the need to replicate this study in order to provide empirical support for the findings of the present study.

- This study should be replicated using university students and teachers in departments of Nursing sciences in South East Zone of Nigeria.
- A study could be carried out to investigate the factors that militate against knowledge, access and use of ICT as they affect students' academic performance or achievement.

## Summary

This study was carried out to investigate the knowledge, access and use of ICT among students and teachers in Nursing Sciences Department UNEC. 3 objectives and six hypotheses guided the study. The objectives were to: ascertain what students and teachers know about ICT, (ii) determine students and teachers access to ICT, (iii) determine students and teachers use of ICT. Literatures were reviewed to cover the objectives and hypotheses of the study. A descriptive cross sectional survey design was used. All the 454 undergraduate students in the Department of Nursing and 23 teachers comprised the subjects for the study. A researcher-developed questionnaire was the instrument for data collection.

Data were subjected to descriptive statistics and analyzed using student's t-test and Chi square. Probability value less than 0.05 was considered statistically significant. Majority of the students 346 (80.5%) and majority of the teachers 20(90.9%) had knowledge of ICT. Respondents had access to the following ICT: computer; students 314(73.0%), teachers 20 (90.9%), Internet; students 343(79.8%), teachers 22(100%) and e-mail; students 248(57.7%) and teachers 17(77.3%). Students performed academic activities several days in a week with ICT 154(35.8%). Teachers performed academic activities several days in a week with ICT 9(40.9%). The Internet activities mostly performed by the students

were: browsing 386(89.8%), chatting with friends 274(63.7%) and e-mailing 262(60.9%). The Internet activities mostly performed by teachers were: browsing 22(100%), e-mailing 20(90.9%) and downloading articles 18(81.8%). Google is the most common search engine used by students 393(91.4%) and teachers 20(90.9%). According to the respondents, high cost of ICT 281(62.2%) and irregular power supply 258(57.1%) were major factors that affect accessibility to and use of ICT negatively. There was no significant difference ( $p > 0.05$ ) in the types of ICT used at different study levels among students. There was no significant difference ( $p > 0.05$ ) in the accessibility to preferred ICT types among male and female students. There was no significant difference ( $p > 0.05$ ) in the access to ICT types among teachers and students. There was no significant difference ( $p > 0.05$ ) in the constraints associated with ICT use among students and teachers. There was significant difference ( $p < 0.05$ ) in the use of ICT between students and teachers.

Findings of this study revealed that there is still need to provide ICT materials at subsidized rate in order to encourage use in university education. There is need also to organize ICT training in universities in order to make teachers and students acquainted with various ICT tools. The various arms of governments including well meaning Nigerians should help improve power supply in universities so that access and use of ICT in teaching / learning can be enhanced. The research design was the descriptive cross-sectional survey.

## **Conclusion**

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

- Most students and teachers have knowledge of ICT
- Majority of students and teachers encounter challenges in accessing ICT especially lack of expertise and high cost of ICT.
- ICT materials are not adequately utilized in the core teaching-learning in the university.

## **Recommendation**

The following recommendations are made in view of the findings and educational implication of the study.

- The problem of high cost of ICT, needs to be addressed especially for students in order for them to better access and use the ICT materials. Correcting the problem of no or little access of students to ICT requires a holistic approach on the part of the government and the university authority.
- In order to ensure better exploitation of ICT, the management of the university should invest in acquisition of ICT, both hardware and software in sufficient numbers to cover the ICT needs of both students and teachers. Investment in maintenance is also required.
- The university administration should ensure that she sets up a monitoring team competent in ICT, to ensure ICT use during teaching and learning in the institution.
- Both students and teachers need on-going ICT related training which will assist in significantly developing their ICT skills, improve access to

needed information and enhance efficiency in their occupation (student or teachers).

- Finally, the government, the university administration and stakeholders should provide adequate and current ICT equipment, services and related materials such as regular power supply relevant in the education industry with a view toward increasing availability and access to ICT in particular and improving teaching and learning in general in the university.

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**APPENDIX 1**  
**QUESTIONNAIRE**

Department of Nursing Sciences  
Faculty of Health Sciences and Technology  
University of Nigeria  
Enugu Campus

**Dear Respondent,**

I am Okoliye Eucharia, a post graduate student of the above Department. I am conducting a study on: knowledge, accessibility and use of Information Communication Technology among students and teachers in Nursing Department, University of Nigeria Enugu Campus. The study is for academic purpose and all the information supplied will be treated with confidence. The answers you give to the questions here will in no way influence how you are treated as an individual. The findings of this research will help us to understand how to use ICT better and improve teaching and learning. I implore you to give as honest an answer to each question as possible. I guarantee your confidentiality. Do not write your name.

Thank you.

**Instruction:**

This questionnaire explores the knowledge, access and ICT use among lecturers and undergraduate students in Department of Nursing UNEC. There is no right or wrong answer because each student or lecturer has his or her academic experience. Please be sure to answer every item by completing the following:

**Questionnaire on ICT Knowledge, Access and Use (QIKAU)**

**Section A: Demographic Characteristics**

**Instruction: Please, tick [✓] in the correct space the most applicable option and give appropriate response where specified.**

1. Age: What is your age last birth day? \_\_\_\_\_
2. What is your gender?
  - a. Female [   ]
  - b. Male [   ]
3. What is your marital status?
  - a. Married [   ]
  - b. Single [   ]
  - c. Widowed [   ]
  - d. Divorced [   ]
  - e. Co-habiting [   ]

4. What is your Religious inclination?

- a. Christianity [ ]
- b. Islam [ ]
- c. Traditional African Religion [ ]
- d. Others, please specify\_\_\_\_\_

5. Year of Study {for students only}

- a. 200 level [ ]
- b. 300 level [ ]
- c. 400 level [ ]
- d. 500 level [ ]

6. Rank {for lecturers only}

- a. Professor [ ]
- b. Senior lecturer [ ]
- c. Lecturer I [ ]
- d. Lecturer II [ ]
- e. Graduate Assistant [ ]

## SECTION B: Questionnaire on ICT Knowledge, Access and Use

**Instruction: Please, tick [√] in the correct space the most applicable option(s) and give your own option where necessary or specify.**

### A: Knowledge about ICT

7. Have you received any form of training on ICT?

- a. Yes [ ]
- b. [ ]

8. What type of Computer training did you receive?

- a. Formal [ ]
- b. Non-formal [ ]
- c. None [ ]

9. If yes to question ( 8) above, what kind of training package were you exposed to?

- a. Computer Appreciation [ ]
- b. Micro soft Word [ ]
- c. Microsoft Excel [ ]
- d. Microsoft Access [ ]
- e. Corel Draw [ ]

- f. Adobe Acrobat [ ]
- g. E-mail [ ]
- h. Internet [ ]
- i. Others, please specify \_\_\_\_\_

10. If No to question (8) above, how do you receive information from the computer?

- a. Help from a friend [ ]
- b. Paid agents [ ]
- c. Cyber café assistant [ ]
- d. Other, please specify \_\_\_\_\_

11. Indicate your knowledge confidence in using the computer, by ticking the one that interpretes your knowledge confidence?

- Very confident = 4 points
- Quite confident = 3 points
- Confident = 2 points
- Not confident = 1 point

| S/N | ITEM                            | Very<br>Confident<br>4 | Quite<br>Confident<br>3 | Confident<br>2 | Not<br>confident<br>1 |
|-----|---------------------------------|------------------------|-------------------------|----------------|-----------------------|
| a.  | Use of Mouse                    |                        |                         |                |                       |
| b.  | Use of Keyboard                 |                        |                         |                |                       |
| c.  | Customizing Desktop Environment |                        |                         |                |                       |
| d.  | Window installation             |                        |                         |                |                       |
| e.  | Microsoft word Processing       |                        |                         |                |                       |
| f.  | Microsoft Excel                 |                        |                         |                |                       |
| g.  | Microsoft Access                |                        |                         |                |                       |
| h.  | Microsoft Office Publishing     |                        |                         |                |                       |
| i.  | Microsoft Power point           |                        |                         |                |                       |
| j.  | Web Publishing                  |                        |                         |                |                       |

12. In your opinion what are the benefits or usefulness of ICT?

- a. Using ICT makes lesson more interesting [ ]
- b. Using ICT makes teaching more enjoyable [ ]
- c. Using ICT makes lesson more diverse [ ]
- d. Using ICT improves presentation of learning materials [ ]
- e. Using ICT makes lecture easier to understand [ ]
- f. Using ICT increases studentsömotivation [ ]
- g. Using ICT improves studentsölearning [ ]
- h. Using ICT makes lecture easier to deliver [ ]
- i. Enhances recall of previous learning [ ]
- j. Provides new stimuli [ ]

- k. Provides systematic/steady feedback in learning [ ]
- l. Provides access to rich sources of information [ ]
- m. ICT is learner-centered-learning tool [ ]
- n. Gives me more confidence [ ]
- o. Makes teaching more fun [ ]
- p. Makes learning more fun [ ]
- q. Makes my administration more efficient [ ]
- r. Gives me more prestige [ ]

**B: Access/Availability to ICT**

13. What type (s) of ICT do you have in your institution?

- a. Computer [ ]
- b. E-mail [ ]
- c. Internet [ ]
- d. Digital Camera [ ]
- e. Scanner [ ]
- f. Video [ ]
- g. Data Projector [ ]
- h. Slides [ ]
- i. Film Strips [ ]
- j. Electronics notice boards [ ]
- k. Disc player [ ]
- l. Bulletin boards [ ]
- m. Television sets [ ]
- n. Radio (Tape recorder) [ ]
- o. Others, please specify\_\_\_\_\_

14. What type of ICT do you have access to?

- a. Computer [ ]
- b. E-mail [ ]
- c. Internet [ ]
- d. Digital Camera [ ]
- e. Scanner [ ]
- f. Video Equipment [ ]
- g. Data Projector [ ]
- h. Slides [ ]
- i. Film strips [ ]
- j. Electronic notice boards [ ]
- k. Disc player [ ]
- l. Bulletin boards [ ]
- m. Television sets [ ]
- n. Radio (Tape recorder) [ ]
- o. Others, please specify\_\_\_\_\_

15. Do you possess a computer?
- a. Yes ☐
  - b. No ☐
16. If óyes óto question {16} above what type of computer do you have?
- a. Desktop ☐
  - b. Laptop ☐
  - c. Palmtop ☐
  - d. Others, please specify\_\_\_\_\_
17. If answer to question 16 (above) is yes, are you linked to internet?
- a. Yes ☐
  - b. No ☐
18. If óNoô to question {16} above where do you access ICT services?
- a. Commercial Cyber Café ☐
  - b. University Library ☐
  - c. University Hostel ☐
  - d. Home ☐
  - e. Office ☐
  - f. Classroom ☐
19. Are computer available to students in your institutions?
- a. Yes ☐
  - b. No ☐
20. What factors do you think that affect access to ICT in your institution?
- a. High cost of ICT ☐
  - b. Irregular Power supply ☐
  - c. Security challenges ☐
  - d. Long distance ☐
  - e. Insufficient space ☐
  - f. Time factor ☐
  - g. Computer illiteracy ☐

### C: Use of ICT

21. What activity (ies) do you perform with ICT/Computer?

- a. Typing [ ]
- b. Data Processing [ ]
- c. Academic Presentation [ ]
- d. Drawing [ ]
- e. Designing [ ]
- f. Chatting [ ]
- g. Playing games [ ]
- h. Watching films [ ]
- i. Playing music [ ]
- j. Assessing Academic information [ ]
- k. News [ ]
- l. Research [ ]
- m. Computation/Calculation [ ]
- n. Academic purposes [ ]

22. How often do you use ICT/Computer?

- a. Daily [ ]
- b. Several days in a week [ ]
- c. Once a week [ ]
- d. Rarely [ ]
- e. Not at all \_\_\_\_\_

23. What type of Computer software do you often use?

- a. Micro soft Word [ ]
- b. Micro soft Access [ ]
- c. Micro soft Power point [ ]
- d. Micro soft Excel [ ]
- e. Corel Draw [ ]
- f. Games/Education software [ ]
- g. Others please specify\_\_\_\_\_

24. How often do you use computer/ICT for academic purpose?

- a. Daily [ ]
- b. Several days in a week [ ]
- c. Once a week [ ]
- d. Several days in a month [ ]
- e. Rarely [ ]
- f. Never [ ]

25. What is your difficulty level in using a computer?

- a. Very easy [ ]
- b. Easy [ ]
- c. Difficult [ ]
- d. Very difficult [ ]

26. How competent are you in the following ICT applications?

| S/N | ICT APPLICATION    | Excellent<br>5 | Good<br>4 | Fair<br>3 | Low<br>Capability<br>2 | No<br>Capability<br>1 |
|-----|--------------------|----------------|-----------|-----------|------------------------|-----------------------|
| 1.  | Word processing    |                |           |           |                        |                       |
| 2.  | File Navigation    |                |           |           |                        |                       |
| 3.  | Internet Browsing  |                |           |           |                        |                       |
| 4.  | E-mailing          |                |           |           |                        |                       |
| 5.  | Presentation Tools |                |           |           |                        |                       |

27. What Internet activities do you engage in?

- a. Browsing [ ]
- b. Scanning journals [ ]
- c. Downloading articles [ ]
- d. Internet surfing [ ]
- e. E-mail [ ]
- f. Chatting with friends [ ]
- g. Playing music [ ]
- h. News [ ]
- i. Others, please specify\_\_\_\_\_

28. What search engine(s) do you often use?

- a. Yahoo [ ]
- b. Goggle [ ]
- c. MSN Hot mail [ ]
- d. Ask Jeeves [ ]

29. How do you use Internet for browsing for academic work?

- a. Daily [ ]
- b. Several days in a week [ ]
- c. Once a week [ ]
- d. Several days in a month [ ]
- e. Rarely [ ]
- f. Never [ ]

30. What is your difficulty in using Internet?
- a. Very easy [ ]
  - b. Easy [ ]
  - c. Difficult [ ]
  - d. Very Difficult [ ]
31. Do you require assistance while using a computer/internet?
- a. Yes [ ]
  - b. No [ ]
32. Which ICT skill listed below do you perceive yourself confident in performing?
- a. Word processing [ ]
  - b. Printing a document [ ]
  - c. Power point presentation [ ]
  - d. Adobe Acrobat [ ]
  - e. Downloading materials [ ]
  - f. Accessing information from CD ROM, DVD, Flash drives etc [ ]
  - g. Others, please specify \_\_\_\_\_

**D. Factors affecting Access/Use of ICT**

33. What factor (s) do you think that constrain ICT access and use?
- a. Lack of expertise with ICT [ ]
  - b. Lack of confidence in using ICT [ ]
  - c. Insufficient knowledge of appropriate software [ ]
  - d. Insufficient knowledge on how to use ICT equipment/  
Computer [ ]
  - e. High cost of airtime [ ]
  - f. High cost of computer [ ]
  - g. Irregular power supply [ ]
  - h. Occupation [ ]
  - i. Poor/Lack of training [ ]
  - j. Lack of knowledge on how to evaluate the use and the  
role played by ICT in teaching/ learning [ ]
  - k. Lack of inclusion of ICT in teaching and learning [ ]
  - l. Others, please specify \_\_\_\_\_

Department of Nursing Sciences  
Faculty of Health Sciences and Technology  
University of Nigeria  
Enugu Campus.  
14<sup>th</sup> May, 2014.

The Head  
Department of Nursing Sciences  
University of Nigeria  
Enugu Campus  
Enugu

**APPLICATION FOR ADMINISTRATIVE PERMISSION TO USE 200, 300, 400, 500 LEVEL NURSING STUDENTS AND LECTURERS IN YOUR DEPARTMENT FOR RESEARCH STUDY.**

I humbly apply for permission to use the 200, 300, 400, 500 level nursing students and Lecturers in your school for my research study. I am a postgraduate student of the Department currently carrying out research study on **knowledge, Accessibility and Use of Information Communication Technology Among Students in Nursing Science Department.**

The researchers project is under the supervision of Dr. (Mrs) N.P. Ogbonnaya of the Department of Nursing Sciences. Informed consent would be sought from the respondents and information obtained would be treated with utmost confidentiality.

Thank you.

Yours faithfully,

**Okoliye Eucharia Okwudili**  
08069041537

### CONSTRUCT VALIDITY

In testing the construct validity of the research instrument, the variations in items were tested for using ANOVA test statistics for both Gender and Year of Study of the sample students and Gender and Rank for the sample lecturers. The ANOVA results for the two groups for the students and lecturers were then correlated using Kendall's tau\_b correlation coefficient gave a correlation coefficient (Kendall's tau\_b) of 0.736 ( $p = 0.013 < 0.05$ ) for the students and 0.854 ( $p = 0.008 < 0.05$ ) for the lecturers. This showed that there is a very strong construct in the research instrument. (see Appendices for tables)

### TEST OF RELIABILITY

In testing the reliability of the test instrument, Cronbach's Alpha was used. An alpha of 0.797 and an inter-item (standardised) coefficient of 0.806 were obtained for the students while alpha of 0.893 and an inter-item (standardised) coefficient of 0.886 were obtained for the lecturers. These being greater than 0.7 indicate that the reliability of the test instrument is very strong. (see appendices)

### APPENDICES

#### CONSTRUCT VALIDITY TEST RESULT

##### Nonparametric Correlations (For Students)

| Correlations    |               |                         | Sex   | Year of Study |
|-----------------|---------------|-------------------------|-------|---------------|
| Kendall's tau_b | Sex           | Correlation Coefficient | 1.000 | .736          |
|                 |               | Sig. (2-tailed)         | .     | .013          |
|                 |               | N                       | 38    | 38            |
|                 | Year of Study | Correlation Coefficient | .736  | 1.000         |
|                 |               | Sig. (2-tailed)         | .013  | .             |
|                 |               | N                       | 38    | 38            |

##### Nonparametric Correlations (For Lecturers)

| Correlations    |      |                         | Sex   | Rank  |
|-----------------|------|-------------------------|-------|-------|
| Kendall's tau_b | Sex  | Correlation Coefficient | 1.000 | .854  |
|                 |      | Sig. (2-tailed)         | .     | .008  |
|                 |      | N                       | 9     | 9     |
|                 | Rank | Correlation Coefficient | .854  | 1.000 |
|                 |      | Sig. (2-tailed)         | .008  | .     |
|                 |      | N                       | 9     | 9     |

**RELIABILITY TEST RESULT (for Students)****Scale: ALL VARIABLES****Case Processing Summary**

|       |                       | N  | %     |
|-------|-----------------------|----|-------|
| Cases | Valid                 | 38 | 100.0 |
|       | Excluded <sup>a</sup> |    | 0.0   |
|       | Total                 | 38 | 100.0 |

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

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .797             | .806                                         | 138        |

**RELIABILITY TEST RESULT (for Lecturers)****Scale: ALL VARIABLES****Case Processing Summary**

|       |                       | N | %     |
|-------|-----------------------|---|-------|
| Cases | Valid                 | 9 | 100.0 |
|       | Excluded <sup>a</sup> |   | ~ 0.0 |
|       | Total                 | 9 | 100.0 |

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

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|----------------------------------------------|------------|
| .893             | .886                                         | 138        |



DEPARTMENT OF NURSING SCIENCES  
FACULTY OF HEALTH SCIENCES & TECHNOLOGY  
COLLEGE OF MEDICINE  
UNIVERSITY OF NIGERIA



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Your Ref: .....  
Our Ref: UN/CM/DNS/90

Date: .....

**HEAD: UCHENNA V. OKOLIE, PhD, RPHN, RN, RM, FWACN**

TO WHOM IT MAY CONCERN

IDENTIFICATION LETTER

RE: OKOLITE EUGENIA OKWUDILI  
REG NO: PG/MSC/07/47180

This is to certify that the bearer of this letter is a student of Department of Nursing Sciences, faculty of Health Sciences and Technology, College of Medicine, University of Nigeria, Enugu Campus.

Kindly allow him/her to carry out Research in your department.

Thank you.



Correspondence: Department of Nursing Sciences University of Nigeria Enugu Campus  
Email: uchenna.okolie@unn.edu.ng, ucheokolie2003@yahoo.com

# UNIVERSITY OF NIGERIA TEACHING HOSPITAL

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Specialist Surgeon, Endoscopist

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Our Ref.....



Dr. C. C. AMAH, MBBS, FWACS, FICS, FIAM, FNIM, FCE

Chief Medical Director

Dr. (Mrs.) ANNE C. NDU, MBBS, FWACP, MPH.

Chairman Medical Advisory Committee

3rd June, 2014.

Date.....

NHREC/05/01/2008B-FWA00002458-1RB00002323

## ETHICAL CLEARANCE CERTIFICATE

**TOPIC:** KNOWLEDGE, ACCESSIBILITY AND USE OF INFORMATION  
COMMUNICATION TECHNOLOGY (ICT) AMONG STUDENTS  
AND TEACHERS IN SELECTED NURSING PROGRAMMES IN  
ENUGU STATE

**BY:** OKOLIJE EUCHARIA OKWUDILI

**FOR:** A DISSERTATION FOR MASTER'S DEGREE IN NURSING  
EDUCATION OF THE DEPARTMENT OF NURSING SCIENCES,  
FACULTY OF HEALTH SCIENCES AND TECHNOLOGY, UNEC

This research project on the above topic was reviewed and approved by  
the University of Nigeria Teaching Hospital Health Research Ethics Committee.  
This certificate is valid for one year from date of issue.

Prof. R. E. Umeh

Chairman, Health Research Ethics Committee

Date: 16/06/14

#### INFORMED CONSENT

I am Okolije Eucharia, a post graduate student of Nursing Sciences Department, University of Nigeria Enugu Campus, (UNEC). . I am conducting a study on: Assessing the levels of knowledge, accessibility and use of Information Communication Technology (ICT) among students and teachers in Nursing Department, University of Nigeria, Enugu Campus, (UNEC) and School of Nursing, UNTH, Enugu. The study is for academic purpose and all the information supplied will be treated with confidence. The answers you give to the questions here will in no way influence how you are treated as an individual. The findings of this research will help us to understand how to use ICT better and improve teaching and learning. I implore you to give as honest an answer to each question as possible. I guarantee your confidentiality. Do not write your name.

Thank you.

Department of Nursing Sciences  
Faculty of Health Sciences and Technology  
College of Medicine  
University of Nigeria  
Enugu Campus.  
3<sup>rd</sup> June, 2014

The Chairman  
Health Research Ethics Committee  
University of Nigeria Teaching Hospital  
Ituku-Ozalla,  
Enugu.

Dear Sir,

**APPLICATION FOR ETHICAL CLEARANCE CERTIFICATE**

**RE: MSc STUDY ON "KNOWLEDGE, ACCESSIBILITY AND USE OF  
INFORMATION COMMUNICATION TECHNOLOGY (ICT) AMONG STUDENTS  
AND TEACHERS IN SELECTED NURSING PROGRAMMES IN ENUGU STATE."**

I humbly apply for Ethical Clearance Certificate to enable me proceed with my MSc study on "Knowledge, Accessibility and Use of Information Communication Technology (ICT) among Students and Teachers in Selected Nursing Programmes in Enugu State".

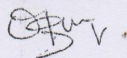
I am MSc student in Nursing Sciences Department, Faculty of Health Sciences and Technology, College of Medicine, University of Nigeria, Enugu Campus.

This application is accompanied with the Research Proposal, GTB Bank Teller, Receipt of payment for the Ethical Clearance, letter of Identification from the Department of Nursing Sciences and Informed Consent.

I am looking forward to prompt consideration.

Thanks.

Yours faithfully,



**Okolije Eucharia Okwudili**  
080 6904 1537