UNIVERSITY OF THE WESTERN CAPE
FACULTY OF COMMUNITY AND HEALTH SCIENCES

THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES BY NURSE EDUCATORS FOR TEACHING AND LEARNING IN EDO STATE, NIGERIA

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ABSTRACT

Information and Communication Technologies (ICT) are for information storage, retrieval, display and transmission through electronic means in our day-to-day life. The use of technology in education has made both learners and educators to achieve new possibilities because life is made easy for them due to its inherent advantages which range from support of conventional classroom work, design, development of learning materials to accessing virtual libraries. Harnessing these benefits places a great deal of demand on nurse educators to improve the teaching-learning experience of learners. However, the major players, especially the nurse educators in Nigeria, have not been properly investigated to find out if they use technology in teaching, and if they do, what types they use. The study aimed to explore and describe the nurse educators' use of Information and Communication Technologies in teaching and learning in nursing schools in Edo State, Nigeria. It focused on the type of Information and Communication Technologies used by nurse educators, how they use them, and the challenges they face, if any, in the use of technologies with a view to suggesting ways of overcoming the identified challenges. An exploratory descriptive quantitative research design with the use of self-administered questionnaires was adopted. The population was all the 36 nurse educators in the three universities that offer the Bachelor in Nursing Science programmes in Edo State. Validity and reliability of the study questions were ensured and a pilot study was done to ensure internal consistency by measurement with the Cronbach's alpha consistency measure that yielded 0.85. Descriptive analysis was employed with the aid of frequencies, tables and graphs. Findings of the study indicate that the nurse educators use technology for teaching and learning. They all use the laptop 34(100%); desktop computer

accounts for 33(97.1%). The respondents use these technologies in conjunction with word processing and spreadsheet for direct classroom teaching, preparation of lectures and students' results as well as classroom facilitation. Twenty-five (25) respondents (73.5%) use the mobile technologies such as cell phones and emails to send and receive messages from students. Thirty (30) respondents (88.2%) store information as well as browse the Internet. The use of these applications is quite high, unlike video transmission to receive recorded lectures from out-stations which amounted to 7(20.6%) and video conferencing to dialogue with nursing experts 6(17.6%). The CD ROMS are used for direct classroom teaching, storage of course materials and for rehearsal and revision purposes by less than 50% of the respondents each. The respondents identified erratic power supply, unstable connectivity and inadequate ICT facilities as some of the major challenges they encounter. In conclusion, the study recommends among other things that the various departmental and personal offices of the lecturers be equipped with modern technology facilities. The university management is urged to explore other alternative power supply like solar energy. Furthermore, all the role players are urged to play their part effectively to make ICT for teaching and learning beneficial and effective.

KEYWORDS

- Challenges
- Information Communication Technology
- Nurse Educators
- Nursing School
- Nursing Students
- Teaching and Learning
- Use of ICT

DECLARATION

I declare that "*The Use of Information and Communication Technologies by Nurse educators for Teaching and Learning in Edo State, Nigeria*" is my own work, that it has not been previously submitted for any degree or examination in any University and that all the sources l have used or quoted have been indicated and acknowledged as complete references.

Roselynd Ejakhianghe Esewe November 2013

Signed……..

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LIST OF ACRONYMS AND ABBREVIATIONS

ICT	Information and Communication Technology
IT	Information Technology
ITAA	Information Technology Association of America
SPSS	Statistical Package for the Social Sciences
UTAUT	Unified Theory of Acceptance and Use of Technology
UWC	University of the Western Cape
HOD	Head of Department
PDA	Personal Digital Applications
IM	Instant Messaging
EMAIL	Electronic Mail
UNESCO	United Nations Educational, Scientific and Cultural Organization
NMC	Nursing and Midwifery Council
NLN	National League for Nursing
NUC	National Universities Commission

DEFINITION OF TERMS

For the purpose of this study, the following operational meanings shall be attached to these terms:

Challenges: These refer to difficulties in the form of unavailability or insufficiency of skills, infrastructure, software and hardware, as well as technical or managerial support that hinder the use of information and communication technology for teaching and learning.

Information and Communication Technology (ICT): This is defined as "technologies used for information storage, retrieval, display and transmission through electronic means" used by faculty members and capable of assisting with delivery and receiving teaching and learning (Ajuwon & Rhine, 2008**:**176; UNESCO, 2007**:**1).

Nurse Educators: These are registered nurses who possess a university degree or other higher qualifications to lecture in a university in Nigeria.

Nursing School: An approved faculty or department by government and professional regulatory body in a university dedicated to the training of nurses.

Nursing Students: Searle, Human and Mogotlane (2009**:**163) refer to *a nurse learner* as a person who is undertaking training in nursing and has registered as a learner nurse; while Ainsley and Brown (2009**:**228) refer to nursing students as intended nurses or practicing nurses who enroll in an institution to complete prerequisites for a nursing programme. In this study, the term "nurse learner" will be used to imply nursing students undergoing nursing education programme in any university in Nigeria.

Teaching and Learning: Teaching means helping a learner to understand (Ehlers, 2002**:**3); while learning is commonly defined as a change in human disposition or capability that persists over a period of time and not simply due to the growth process (Quinn, 1998**:**53). Therefore, teaching and learning in this study refer to the methods or strategies adopted by the teacher to help a learner gain endearing skills to perform present or future tasks.

Use: To deploy something as a means of accomplishing a purpose or achieving a result.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Introduction

Information and Communication Technology (ICT) is defined as ‘‘technologies used for information storage, retrieval, display and transmission through electronic means” (Ajuwon & Rhine, 2008**:**176; UNESCO, 2007**:**1). The process of ICT use partly depends on interaction between technology innovation and human values.

1.1.1 Benefits of ICT in General

ICT is known to have significantly changed the way people .learn, communicate and do business. Moreover, it has become one of the major factors that are used in shaping the global economy thereby resulting in rapid transformational changes in society. ICT has also created an environment that calls for a close linkage network between individuals, groups, institutions and organizations around the world to share views and ideas and acquire knowledge on new discoveries and fields (Ajuwon & Rhine, 2008**:**176).

1.1.2 Uses of ICT in Teaching and Learning

The use of ICT in teaching and learning cannot be over-stated. Adeosun (2010**:**195) highlighted some ways in which ‘‘ICTs have been harnessed in education to include supporting conventional classroom work, design and development of learning materials’’. Furthermore, ICT aids in gaining access to electronic teaching materials such as e-books, journals, accessing virtual libraries or providing access to a plethora of resources especially in electronic form. ICT also plays a key role in educational administration as well as in the facilitation of independent study and individual instruction, especially on the open distance-learning programme as it makes learning more vivid and engaging. It can also assist the teacher in assessment and testing of materials. More importantly to the developing countries, it brings a permanent solution to brain drain problems because ICT makes it possible to share

knowledge through easy communication and travel as well as greater collaboration between developed and developing countries (Dodani & LaPorte, 2005**:**489). ICT also enhances students' curiosity and motivation which in turn forces the lecturers to seek more knowledge to present to students (Kosakowski, 1998). Therefore, the competences gained by using ICTs can prepare undergraduate students better for their further education and in the future world of work (Adeosun, 2010**:**195).

1.1.3 Uses of ICT in Nursing Education in General

The advantage of ICT in education, nursing inclusive, is to create a familiarity of how these tools work and how to put them into better use for the optimal benefits of both the learner and the educator (Watson, 2006**:**201). In modern times, teachers will need effective and efficient information resources. The use of ICT will aid them to perform their roles much more efficiently and effectively (Adeoye & Popoola, 2011**:**3; Tinio, 2002**:**22). It is therefore important that a variety of ICT support and enabling mechanisms be implemented in order to optimize teachers' use of ICTs. Principal among these factors are political and economic commitments at both governmental and school levels (UNESCO, 2007**:**7). In order to reap the benefits of ICT, most nations across the globe have developed national ICT policies to serve as a working document for its integration in all facets of life (Yusuf, 2005**:**317). This is because ICT is seen as a vehicle that is capable of transforming teaching and learning in ways that can enhance development of skills. Importantly, ICT has the benefits and potentials to enrich and motivate and engage students. This helps to create wealth and values in students. This is important because the students are the future workers that ought to be empowered with skills to improve the economy particularly in the area of education and health care (Rutkwoski, Rutkwoski, & Sparks, 2011**:**190; Yusuf, 2005**:**317).

1.1.4 Uses/Need of ICT in Nursing Education in Nigeria

The Nigerian Information Technology (IT) policy is clear on its objectives and mission statement. It harps on the need to use IT in Nigeria for education and also emphasizes that IT must be used to empower the youths and prepare them for global competiveness (FGN, 2001). This is an acceptance of the readiness of the Federal Government to go the extra mile by providing ICT infrastructure beyond only computers in the educational sectors (Yusuf, 2005**:**318). Similarly, Skiba, Connors and Jefferies (2008**:**225), Warren and Connors (2007**:**58), Oblinger (2005a**:**3) and Oblinger and Oblinger (2005) write extensively on the need to understand and use the power of information technologies as a way of preparing the next generation of nurses to interact meaningfully with technological tools as a means to ensure patients' safety. In Nigeria, as well as other African countries, nursing is regarded as one of the key professions that play significant roles in the nations' healthcare delivery system (Adejumo & Ehlers, 2001**:**216; Agbedia, 2012**:**226). Based on the above premises, it is expected that the nursing schools should be kept abreast of these trends in Information and Communication Technological developments (Agbedia, 2012**:**226). Therefore, exploring the challenges of local context on the use of ICT in Nigeria is very apt at this time of the 21st century as the United Nations has set 2015 as the target by which ICT should have been made accessible and usable worldwide (UNESCO, 2007**:**9)

This West African country has an estimated population of 166.2 million. *It is divided into 36 states, including Edo State with* a population of close to 3,233,336 million and a land mass of 6873sqm (FGN, 2008). There are 5 universities in Edo State categorized as follows: *One federal, one state* and *three private* universities. At present, 18 universities in the nation offer nursing science out of the 122 publicly and privately approved universities in the country (NUC, 2012).

1.2 Background to the Problem

There is no denying the fact that the use of ICTs is now the norm and not just a fashion thing in educational systems at all levels throughout the world. The Economic Commission for Africa (ECA) has indicated that the ability to access and use ICT is no longer a luxury but a necessity. Highly competent and well-trained staffs are needed to train the future nurses to enable them to perform their duties more effectively. Various bodies, such as the American Higher Education, emphasize the importance of students' ICT learning together with faculty members, while institutions need to be accountable for their learning. Similarly, the National League for Nursing (NLN) Board of Governors' Position Statement on this equally highlights the need to prepare the next generation of nurses to the highest practices in technology-rich environments ("National League for Nursing," 2008). These issues all point to a growing urgency to meet the global use of ICT in the facilitation of learning as classrooms today are filled with a generation of learners that are known as 'generation net' with their peculiar needs for digital information (Oblinger, 2005a**:**3; Oblinger & Oblinger, 2005).

Based on personal observations coupled with her experience as a nurse educator for a number of years in one of the nursing schools in a Nigerian university, the researcher believes that the concept of ICTs, though known, is not yet widely used in Nigerian health institutions as an instrument of training. Apart from irregular phone calls by lecturers to class representatives to re-schedule classes or venues, the use of ICTs to facilitate or disseminate information to the students as far as teaching and learning is concerned is still relatively poor. The researcher is of the opinion that the use of technology in the facilitation of learning by nurse educators in the schools is very vital to the successful training of our future nurses. This assertion is based on her perceptions of the gains of technology use in education from her observation of other faculty members and from studies which highlights a great deal of possibilities through the use of technology.

1.3 Problem Statement

The Nigerian policy on Information Technology clearly spells out the need for everyone to use IT in order to empower the youths and prepare them for global challenges and competiveness (Yusuf, 2005**:**318). Nursing being a core health profession is not left out of this expectation; but it is unclear how the nurse educators have embraced this clarion call. Although recent research by many scholars including Zaidatun, Khawla, Noor, and Jamalludin (2012**:**138) and Selwyn (2007**:**83) indicates significant success in bringing teachers and students into meaningful contact with ICT in the educational system, a lot still remains to be done in integrating ICT into the main stream of teaching and learning practices that are aimed at developing 21st Century skills (Rutkwoski et al., 2011**:**192). While the use of ICT forms part of the new expectations in teaching of nursing students, the major players like nurse educators in Nigeria have not been properly investigated to determine whether their use of ICT is adequate. If they use them, the researcher would like to know the nature of their use and the types of challenges they may be facing in using them. Studies related to the use of ICT by nurse educators have not been adequately researched in Nigeria, especially in Edo State.

1.4 Aim of the Study

The aim of this study is to explore and describe some of the major issues that pertain to nurse educators' use of ICTs in teaching and learning in nursing schools in Edo State, Nigeria with a view to proffering solutions to identified problems.

1.5 Objectives of the Study

The objectives of the study are to:

1) Identify and describe the nature of ICT devices that nurse educators use in Edo State, Nigeria.
2) Describe how nurse educators use ICT in nursing schools in Edo State, Nigeria.

3) Explore challenges faced by nurse educators in the use of ICT in Edo State, Nigeria.

4) Explore solutions to solve the identified problems.

1.6 The Research Questions

The research questions to which answers are provided in this study are:

1) What forms of ICT devices do nurse educators use?

2) How do nurse educators use ICT in enhancing the teaching-learning experiences of the nurse learners in their schools in Edo state, Nigeria?

3) What are some of the challenges that are faced by nurse educators in using ICT for teaching and learning?

4) What solutions would solve the nurse educators' challenges to enable them to effectively and efficiently improve the use of ICT in teaching and learning for nurses?

1.7 Significance of the Study

1) This research is significant in the sense that the issues involved are important for the transformational development of the teaching-learning environment in nursing at Nigerian universities.

2) The study is also able to identify any challenges that are being faced and provide possible solutions to the challenges.

3) The study is capable of adding new information to the already existing body of knowledge on the challenges faced by nurse educators in the teaching of nursing students, especially in developing countries like Nigeria.

1.8 Thesis Outline

Chapter 1 is an introduction to the thesis. It gives the background to the study, outlining the aim and objectives, significance, methodology and other aspects of the study.

Chapter 2 presents extensive literature on the types of ICTs that can be used in education generally and nursing education in particular. This literature guides the direction of the study. The commonly used ICT tools will be described together with the theoretical framework of the study.

Chapter 3 looks at the methodology of the research. This includes the research design. The concepts of reliability and validity are discussed. Ethical consideration is given prominence together with the study setting, population as well as data collection procedures.

Chapter 4 gives the findings of the study which are presented in tables and graphs accompanied with brief explanations of what they portend in the study.

Chapter 5 involves discussions of the key findings of the study in relation to the literature. A summary of the study and the recommendations specific to the study are presented.

1.9. Conclusion

This chapter briefly outlined the major issues that are addressed by the study with an introduction to the background of the problem and reason for the study. The section highlighted the indispensability of ICT in all facets of life, including nursing education, but the researcher identified nurse educators as key role players that need to be investigated to determine their use of ICT for teaching and learning based on the Federal Government of Nigeria and other important non-governmental bodies' pronouncement on the importance of using ICT to empower the youths for global competiveness. The objectives are to identify the types of ICT devices, how they are used and the possible challenges nurse educators face in the use of ICT and thereafter proffer solutions based on identified challenges. The next chapter will provide an extensive literature review.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section discusses the use of ICT as a tool for teaching and learning as well as its application in education in general and nursing in particular at the international, national and local levels. It traces the historical evolution of ICT in education by looking at studies that employed ICT in education in other countries as well as in Nigeria. A classification of ICT is done and some of the commonly used and available ones are described. This is for ease of understanding of how they are put into use by the nurse educators for teaching and learning. The challenges faced in the use of ICT by educators generally are highlighted in this chapter. Also, the theoretical framework that guide the study is explained in details.

2.2 ICT in Education

2.2.1 The Evolution of ICT in Education

ICTs are diverse sets of technological tools and resources used to manage information through electronic means. The information management can be either used to create, disseminate data and for storage purposes (UNESCO, 2007**:**1). It has become an acceptable means of communication globally due to its inherent advantages that cut across all spheres of life. In education, it supports conventional classroom work, design and development of learning materials. It is important in accessing electronic teaching materials such as books, journals and virtual libraries as well as providing immense access to the world of resources in electronic form. ICT today plays a key role in educational administration, economics, communication and travel (Adeosun, 2010**:**22; Ogbomo & Ogbomo, 2008**:**1; Tinio, 2002**:**22). Consequently, ICT is expected to facilitate the eradication or reduction of poverty, improve service delivery especially in the education and health care sectors by making

government services more accessible. These provisions are enshrined in the 2012 Global ICT Report ("The Global Information Technology Report," 2012).

The evolution of technology in education dates back to the 17th century with illustrations in textbooks. This progressed to slate and chalk boards in the 18th century, while the 20th century saw the increased use of lantern-slide and opaque projectors. Radio and motion pictures followed later. During the 1950s, programmed instruction emerged as the first true educational technology to be developed to meet educational needs. With further advancement in technological information mainly in the area of computers, educators sort for the best approaches to utilize the technology in the classroom. Information was recorded technologically for different purposes of use. For example, all sorts of content was presented as films and television programmes and that technology was later employed to present different types of technological information as learning materials to students. Then, the students' role was merely to learn the information so presented by the technology, just as they learned information presented by the teacher (Betrus & Molenda, 2003**:**18).

The development of inexpensive multimedia computers and the increased accessibility of the internet in the mid-1990s served as pivotal period to technological advancement in education (Campoa, Negrob, & Núñezc, 2012**:**1088). Communication tools such as e-mails and computer conferencing thereafter dominated discussions on the role of different technological equipment in the classroom. Following from the above, Ajuwon and Rhine (2008**:**176), remark that these improvements and the whole evolution of technology in education brought with it numerous other advantages that span all facets of life and the global economic endeavors. This is because they created an environment that makes for a close network between individuals, groups of people, institutions and organizations around the world as they shared their views and ideas about many things and acquired knowledge on new discoveries or new fields every day.

The use of technology simply cuts across all spheres of life, including learning. The academic environment has been evolving very fast from being a formal system of education to a new and robust mode of learning that was more user-friendly as seen in breakthroughs in distance and online learning modes. Web technology and mobile technology was introduced and has since made a great impact on the education sector. Students and teachers are now more prone to the use of on-line technology. There is now rapid growth in students' use of web 2.0 in the developed countries like Australia and the USA (Namdev, 2012**:**259). The 2012 global ICT report has it that the social media has been used to connect hundreds of millions of people from every part of the world. Twitter is reported to have crossed 50 million users, while Facebook has over 500 million users worldwide. Social media has grown phenomenally and is now used to provide some of the best services to mankind with the use of blogs, instant messaging, social networking services, wikis and social tagging applications. It is also now used in education because it has the added advantages of allowing learners to learn while retaining and providing connections with departments, faculties and learning peers. Bloom and Hough (2003**:**245) studies found that this technology can lead to learners having a higher level of knowledge and reduce errors, especially in the healthcare industry than those learning through the traditional lecture format. This is how the developing countries like South Africa and Nigeria have seriously keyed into unlimited use of technology for teaching purposes (FGN, 2001; S/A, 2004).

2.2.2 Classification of ICT

ICTs are classified based on the writers' intended use. The classification by Plomp, Brummelhuis and Pelgrum (1997**:**430) has 3 main categories as stated below:

- ICT as an object: This is when one learns more about information technology.
- ICT as an aspect of education: This specifies the application of ICT in education, such as vocational education or in industries.

- ICT as a medium: This refers to its use in teaching and learning through the mutual exchange of knowledge between learners and teachers. The ICT medium approach occurs in the form of drill and practice exercises, simulations, tutorials, Individual Learning Systems (ILS), educational networks, hypermedia programmes, test generating systems etc.

By the same token, Haddad and Draxler (2002**:**96) classified ICT in education into 3 categories. These are instruments: such as TV, DVD and computers; instructional systems: such as video and multimedia modules; and dissemination as seen in TV broadcast, CD or the Web. However, the choice of this medium as well as its usage depends to a large extent on what the expected outcomes are in terms of education, learning and the teaching objective. Although the dilemma of whether to use technology or not in education is a factor in ICT use, the major challenge really has been how to harness the full power and potential of ICTs so as to make it relevant as an educational tool in order to achieve responsible and effective mediums of knowledge inputs for the school setting and for life-long learning (Adeosun, 2010**:**193).

Based on this understanding, the technologies that were explored in this study are the ones as classified by Plomp et al. (1997**:**430); That is the ones classified as the medium used in teaching and learning through the mutual exchange of knowledge between learners and teachers. The following sub-points describe and illustrate these technologies well along with some of their uses.

2.3 ICT Devices

2.3.1 Classical Media

These media can exist as *audio*, for example, CDs, cassettes or as *visuals*, such as in the use of overhead projectors or *audio visuals* such as film, TV and video. *Audio visual aids*

are technological devices that are used to present units of knowledge or instruction through the auditory and visual stimuli to the learner.

Application: Classical media help the learner to concretize knowledge that is presented to him/her, thereby making an experience unique and endearing. They also complement the work of the teacher in that they help the student in studying of a textbook as an already visualized text that is easy to understand. Like the Chinese proverb says, "One seeing is worth a hundred hearing it" (Rasul, Bukhsh, & Batool, 2011**:**80). They serve as strong tools for interaction between the instructor and students and are invaluable during seminars and lectures (Adamczyk, Holzer, Putz, & Fisher, 2009; Goyal, Purohit, & Bhagat, 2011**:**340).

Among the list of audio-visual aids that can be used in learning**,** (Hansen & Erdley, 2009**:**14) once remarked that the video is the most powerful learning tool mankind can ever have because it enables the replay of scenarios for repetitive learning needs and meets the needs of the visual and auditory learner. Furthermore, it has the potential to integrate art and creativity with scientific knowledge to enhance students' learning in an economical manner.

2.3.2 Computers

Computers are programmable machines which are used to design, accept data, perform prescribed mathematical and logical operation at high speed and display the results of these operations (Henderson, 2007). A wide variety of computers that range from the desktop, palm tops, to micro computers are now available in the market.

Application: Fapohunda (1999) cited in Ogbomo and Ogbomo (2008**:**3), has noted that computers were originally used by scientists for calculating numbers but have gradually become more useful in offices and industries in multiple roles. Desktop computers with internet connectivity, for an example, are becoming a must-have item in any school or household. This has increased students' access to pure educational infrastructures or learning materials and they are now being designed specifically to provide and ease the learning

process (Oviawe & Oshio, 2011**:**127). The communication tools commonly available but not limited for use with the computers are: e-mails, web, word processor and graphic software.

2.3.3 Chat/Yahoo Messenger MSN

This is an Instant Messaging **(**IM) platform in the form of real-time direct text-based communication on-line.

Application: It is often employed between two or more people using personal computers or other devices in "chat rooms" to share information with clients. It is audio-visual in nature. The users' text is transmitted over a network such as the Internet. The advanced instant messaging software also allows enhanced modes of communication such as live voice or video calling and inclusion of links to media. A good example is the Skype. This resource is useful for lecturers to establish communication with students and other professionals who might be distant from them. The use of chat has therefore become a very useful educational tool, particularly to language teachers as it affords them the opportunity to brainstorm with different experts in the fields of study, to study in small groups and also to get feedback on whatever work that might have been covered(Gonzalez, Bolivar, & Venezuela, 2003**:**57).

2.3.4 Course Management Software

This software is generally considered with regard to Web-based courses. It is a self-assisted tool that enables the students to access their courses on the internet by merely clicking on the appropriate site. It employs the e-learning mode of teaching.

Application: With this technology, students are able to identify textbooks, view their assignments, receive messages and discuss coursework assignments with other learners who are distant. The course related software is readily available and monitored by designated librarians to avoid misuse (Cohen, 2002**:**12).

2.3.5 Electronic Whiteboard

The electronic whiteboard is a computer-based type of equipment that uses a hand-held terminal hardware which is embedded with "Linux" operating system for hand-held terminal software.

Application: This type of device allows transmission of a hand-written signal to personal computer terminals by wireless transmission mode. It therefore helps the user by making classroom learning and teaching more effective (Joshi & Morade, 2013). Also, this board has replaced the conventional chalkboard which is now relegated to non-use by many educators because of its dusty nature which serves as another medium of air pollution, apart from being laborious (Joshi & Morade, 2013**:**1).

2.3.6 Electronic mail

The electronic mail or e-mail, as the name implies, is the exchange of mail and files through the Internet. The Internet is a global collection of computers which are linked together.

Application: E-mails are cost effective means of communication that can be used across and within campuses, for marketing of goods and services (Hassett, Spuches, & Webster, 1995**:**221); Adesanya, 2002 cited in (Ogbomo & Ogbomo, 2008**:**4). It also serves as a tool for students in the same department or faculty to be reached by their tutors even outside office hours. Moreover, networks can be explored independently by the students using e-mails. Its components include chat and instant messaging, voice and texting from cell phones and social network sites such as Facebook, MySpace, Twitter, LinkedIn and blogs which are all done via the Internet using mails.

These social network sites have become popular modes of communication within work and school environments. To enable ones' participation in these social network sites, a

self-descriptive profile has to be created and then links are made to other members (Donath & Boyd, 2004**:**73).

2.3.7 Fax Machine

These are telefaxsimile system models. that permit the transmission of printed images such as photos, maps and drawings which are reproduced on paper at a remote receiver (Ogbomo & Ogbomo, 2008**:**4).

2.3.8 Laptop

The Merriam-Webster Online dictionary defines a laptop as “a micro-computer with all the features of a desktop computer” ("Merriam Webster's Collegiate Dictionary," 2003). These features are the processor, screen display, a mouse, a keyboard, including a touch pad and a pointing stick and speakers all put into a single unit. It is powered by electricity through an AC adapter and has a rechargeable battery.

Application: The laptop is used mainly to perform all the activities of a desktop computer with ease because of its mobility. This has made it a favorite of both students and faculty

2.3.9 Mobile Technologies (Cell Phones and PDAs)

These are technologies that use radio waves or infra-red rays in the form of text, voice or video messages to transmit data on a continuous basis irrespective of time. It does not make use of wires, hence they are sometimes referred to as wireless devices (Kim, Mims, & Holmes, 2006**:**79). The most visible of these technologies are the cell phones, wireless computers and Personal Digital Applications (PDAs).

Application: The mobility and unlimited applicability of these devices make them convenient for use to connect with distant people while in public places such as schools, laboratory, libraries and airports (Fernandez, Sadana, Eisenberg, Daronch, & Moursi, 2011**:**33). The PDAs have become more or less like what a tool box is to science students because it has many features such as pharmaceutical prescriber, calculator, camera, media player, voice

recorder and video camera. They can also be effective as data collection tools (Fernandez et al., 2011:33; George, Davidson, Serapiglia, Barla, & Thotakura, 2010:371).

Although the cell phone was at one time an exclusive preserve of the rich in Nigeria, it has recently become easily affordable and available thereby making it a vital tool of communication by everybody, especially departmental and faculty students. Adeoye, Folami-Adeoye, and Houston (2010:2305) observe that improvement in technology towards wireless cellular units has removed the barriers that were once experienced in communication, thus making Nigeria see a growth rate of mobile cellular phone users averaging 50% per year from 2001-2006.

2.3.10 Video Transmission

Video transmission uses a mechanism that allows a programme or video with a special device to decompress data and transmit audio to a speaker. A user or recipient does not have to wait to download a file before it is played. Instead, the message is sent in a continuous stream of data by the sender and it is played as it arrives.

Application: The video player used for transmission purposes can be an integral part of a browser or it can be downloaded from the software makers' website (Namdev, 2012:259).

2.3.11 Video Conferencing

Web conferencing refers to a service that allows conferencing events by different people in remote locations to share information through the internet.

Application: The service allows events to be transmitted right at the time they are taking place from one sender to many receivers. It offers information in the form of text-based messages and voice and chat that can be shared simultaneously across geographically dispersed locations. Applications for web conferencing include meetings, training events, lectures or short presentations from any computer (Namdev, 2012:259).

2.3.12 Web 2.0

This is a millennial or generational "Y" web platform that emerged chiefly as a social media. Social networks are all web-based and provide means for users to interact over the Internet.

Application: It is a medium which is used to build social relationships among people through sharing interest, activities, backgrounds or other experiences in their life. These experiences could be family, school or work-related issues (Hansen & Erdley, 2009**:**2). Healthcare workers and nurse educators could also find it imperative to learn from their technology savvy students. Social networks serve useful purposes in cyber learning with videos, advanced video conferencing, collaboration and networking with peers and faculty and educational research (Hansen & Erdley, 2009**:**2). An interested user is required to download and send a link or profile to enable access. Some examples of the commonly used social platforms are:

(a) Facebook: A social network service that connects people with friends and others whom they work or study with and who live around them or in distant places.

(b) LinkedIn: This is a professional social network that gives the user the keys to controlling their online identity and connects them to their trusted contacts. It helps in exchange of knowledge, ideas and opportunities with a broader network of professional users.

(c) Myspace, Twitter and Ning: This equally shares user contacts with others. They can be used for classroom announcements because they enable one to create communities for learning both inside and outside the classroom.

(d) Wikis: This is a web-page or a set of web-pages that can easily be edited by anyone who is allowed to access it. It is a collaborative tool which helps in the production of group work.

2.3.12.1 Blog

This is a discussion or informational forum available on the World Wide Web (www) and consists of discrete entries called *'posts'*.

Application: Blogs can be set up by a single individual, but even groups of individuals have found it very useful because it covers a range of ideas on a single subject with posts that are written by many members or authors. It has an added advantage of improving communication and writing, information gathering and reading skills of members (Maag, 2005**:**16).

2.3.12. 2 Edublog

Educational blogging allows one to easil*y* create and manage a student, teacher or library blogs. Designs that include videos and photos can be customized quickly with some relative ease. It might include blogs written by students for teachers or teachers for students to comment on their posts. It is becoming an acceptable medium of teaching and learning in higher education (nursing inclusive) because of its ease of application (Kala, Isaramalai, & Pohthong, 2010**:**63).

2.3.12.3 Podcasting

Podcasts are user-generated presentations that are included within the Web 2.0 galaxy. They are also popular among educators because of their ease of application (Kala et al., 2010**:**63).

2.3.13 Word, Spreadsheet and Presentation Software

These are word processing software used in the creation and presentation of documents for varied personal and group purposes.

Application: They enable the individual to create simple and complex documents for sharing. These applications are available in modern day computers and are indispensable to technology applications in the sense that no meaningful communication can be done without

the mastery of its application. A brief description of each application is provided in the following subheadings.

2.3.13.1 Microsoft Word (or simply Word)

This is an application that facilitates the performance of word-processing tasks. Word is used to create documents such as letters, invitations, term papers, flyers, résumés, and novels.

Application: The main purpose of Microsoft Office is to allow the user type documents. Similarly, it has helpful tools such as spelling and grammar check, word count and other features found in the newer versions that permit the user to speak to it or tell it what to do.

2.3.13.2 Spreadsheet

This is an interactive computer application programme for organization and analysis of data in tabular form. Spreadsheets are similar to computer-generated paper accounting worksheets.

Application: The use of spreadsheets in nursing would be to principally track and schedule nursing assignments for team members and students' results (Bloom & Hough, 2003).

2.3.13.3 Presentation software

This is a tool used in the creation of visual presentations. These presentations have found usefulness in a variety of programmes that make it possible to combine a text and some graphic elements to convey the important information to a group of people at once. Some examples are: slide show presentation software and Apple KeyNote and Google Doc.

Application: According to Namdev (2012**:**259), presentation sharing enables one to upload slides to share with others. It gives opportunity to rate and comment on the slideshows of others. This makes it serve as a public link for presenting materials to or from departments, faculty to the students to share content, evaluate and critique presentations, present arguments and discover information from outside sources. Other uses are in teaching of a new or

complex concept, announcement or launch of new products, campaigns, training on key concepts or new policies and presentation of proposals to a group of persons.

2.4 ICT in the Nigerian Education System

The integration of ICT into the Nigerian educational system and economy did not come into full gear until the late 1990s. An IT policy was only enacted in 1999. It was revised in 2001 to meet the growing IT need of the country (FGN, 2001). Although the progress is said to be slow, it has however been well accepted in all facets of life including nursing education for national and capacity building. All the ICT tools mentioned in this study are available for use in Nigeria, but the issue of actual use in terms of its application in teaching and learning is an issue for another study. Yusuf (2005**:**319), remarked that ICT use is contextual and based on its relevance nationally.

2.5 How ICTs are Used in Education

The implementation of new technologies in the educational process is expected to bring new possibilities for both the teacher and the learner because it is known to enhance education quality and richness of learning outcomes (Lamanauskas, SIekienè, & Ragulienè, 2010**:**64). In order to identify the resources needed to make ICT use a reality in the educational setting, the need arises to identify the types of ICTs that have been successfully and frequently used for teaching and learning. They are:

- Formal enabling frameworks of various kinds: The Mobile technology devices such as the CD ROMs, DVDs, cell phones, laptops and personal hand-held computers are in this group. There are various multimedia courses today that cover a wide range of subjects including language, physics, history as well as work with text processors which are recorded on CD or DVD. Multimedia courses are also becoming available from the Internet which provides the users with up-to-date data (Cekerevac, Anđelic, Dvorak, Radovic, & Sajfert, 2011**:**257).

- Social resources: These are in the form of networks and support services. The Internet now plays an important role in these because of the facility it gives to access and use the World Wide Web (www). This involves asynchronous on-line learning, web-based applications that are accessible from anywhere in the world through e-mail, chat, instant messages for communication and video transmission in the form of conferencing (Namdev, 2012**:**262).

Similarly, Dexter and Anderson's (1999**:**2) review of technology in education emphasize two approaches on a continuum of instruction to construction. Instruction is teacher-centered while construction is student-centered. In instructional technology, facts, procedures and skills are emphasized by the teacher; while in construction technology, teachers use software and information technology to allow students learn and work in an active and hands-on kind of way that makes them able to construct learning themselves.

2.5.1 Types of ICTs Mostly Used in Education

The computer, mobile phones, internet and USB sticks have been identified as some of the most commonly available and accessible technologies that can be used in education today by students (Lamanauskas et al., 2010**:**64). Similarly, Oviawe and Oshio (2011**:**127) identify the TV, video tape players, CD and recorders as commonplace ICT tools mostly used in the homes and have also been discovered to serve as powerful change agents for students' learning. They aver that the availability in Nigeria of computers, on-line electronic libraries, Internet facilities, telephones, video recorders, multimedia projectors, CD-MP3, and television in offices and many homes can serve as an effective platform to facilitate and improve teaching and learning. In the same vein, Okiki's (2012**:**5) investigation of University of Lagos lecturers' awareness, attitude and use of electronic resources found that most lecturers use electronic information sources for writing publications, teaching, presentations at seminars/conferences and workshops and also for leisure.

Czerniewicz and Brown (2005:10) carried out a study which focused on ICT that is used in teaching and learning practices in the Western Cape (South Africa) higher education institutions. Their findings show that multimedia resources such as CD-ROM or DVD and Web resources which include hypertexts are the type of ICTs that are most frequently used by staff and students to support the event of discovery. The study also revealed that 90% of staff and 92% of students report that they use computer-based interactive media for teaching or learning. In the same context, Lindstrom (1994), as cited in Oshinaike and Adekunmisi (2012:61), states that multimedia accounts for 75% retention of memory by users as most people tend to remember what they see and hear. Consequently, they used a survey method, personal observation and short interviews to study a sample of 80 university lecturers from two faculties in the University of Ibadan on the use of multimedia tools. Their findings revealed that the types of multimedia resources that are mostly used by lecturers were the Internet, the computer and its accessories 76(95.00%), CD-ROMS 60(75%), projectors and graphics 56(70%), TV 44(55.00%) while transparencies account for just 4(5.00%). These resources are used for teaching, research and publication activities, research paper presentations and for creating lecture notes.

In Malawi, Chaputula (2012:364) used a survey method that included students, academic and library staff to investigate the state of adoption and use of ICT by students and academic staff in Mzuzu University. His findings reveal that ICT, though poorly used, is mainly employed for academically related activity and word-processing tasks. This supports Akbiyik and Seferoglu's (2012:419) report on the choice of primary school computer teachers' use of ICT tools. Textbooks are the most preferred source of teaching and learning, followed by other sources such as websites or videos as teaching and instructional media. The same goes for Cekerevac's et al.(2011:264) report on the use of multimedia and multimedia

presentations in an experimental survey among 200 students in a Serbian University. The findings revealed that less than 30% of lecturers use multimedia tools in their lectures.

Relatively new and inexpensive digital technologies are rapidly emerging daily for use in education, making it compulsory that educators have technology literate skills to keep pace with the demands of their work and the generation of students born in the technology-use era (Oblinger, 2005a**:**3).

2.6 Discussion of Findings from Literature

Literature on nurse educators' use of ICT in Nigeria and Edo State in particular is sparse because it is an area that has not been adequately researched. Searches conducted by the researcher point to nursing and patient care, nursing and clinical students not utilizing ICT facilities fully. Since the nurse educators teach in the higher educational institutions, it is implied that they are covered by the findings that prevail in these institutions which include reference to university lecturers.

In order for students or academics to use ICTs meaningfully for their teaching and learning purposes, they need access to personal, collective and contextual resources (Czerniewicz & Brown, 2005; UNESCO, 1998**:**33; 2007**:**7). Traditional teacher leadership skills and practices cannot be completely dispensed away with in education. However, teachers are expected to possess skills and practices which will enable them to easily access relevant, timely and on-going professional technological developments. Therefore education is the key to the effective use of ICT (UNESCO, 1998**:**29). The choice of technology and what it is used for depends on the objectives of teaching and learning outcomes (Haddad & Draxler, 2002). Learning using modern technological equipment entails paying particular interest on how the technology can be used to improve learning outcomes in the curriculum.

ICT is now a global phenomenon that can no longer be ignored by educators because it has been embraced all over the world due to its importance. Governments globally are harnessing the rich potential of the ICT industry and are using ICT as a tool for national development. Tinio (2002:11) observes that radio and television have been used widely as educational tools since the 1920s and the 1950s respectively. These are in the areas of direct class teaching, school broadcasting and general educational programming over community activities. This type of radio programme is still employed in Nigeria today, but is principally used for health information, agricultural training, science, and mathematics education because access to radio programmes is very widespread (Adeosun, 2010:201). However, newer modes of communication such as telephones, e-mails, newsgroups, blogs, video messaging and podcast have emerged and are now frequently used where the technology and infrastructure are available.

Uwaifo and Eiriemiokhale (2013:31) investigated university lecturers in Edo State to ascertain their use of electronic resources through an exploratory descriptive survey method that involved the four universities in the state with a sample of 380 lecturers. Their findings reveal, among others, that Lecturer II are more in number, with 98% of the respondents indicating that the predominant reason for using ICT is for research while 87% use ICT for preparation of lectures. Of the facilities that are mostly used, computers ranked highest (96%) followed by the smart phones and palm tops (89%). Similarly, Olatokun (2008:281) did a study which involved electronic mail use in research collaboration by lecturers at the University of Ibadan, Nigeria. The findings revealed that e-mails are basically used for communication, file and document exchange, dissemination of results and for data collection.

Instant messaging (IM) devices, though a personal possession by most clients (educators inclusive), is used for teaching and learning. Educators use them to send instant messages and voice calls to students and get immediate feedback. Advantages include instant communication with multiple individuals across the globe. It is not surprising that IM is one

of the largest and fastest growing internet applications entrenched in the life of teenagers today. As a result its use in higher education may need to grow more than its present use. There was an estimated 46.5 billion users worldwide in 2009 (Farmer, 2005**:**54). It is believed to be popular among the students and teenagers since it allows them to create their own status and determine when to respond to a message if they are busy with other tasks such as listening to music with their ear phones on.

2.6.1 Use of ICTs in Nursing Education

The impact of ICT in providing an important resource for education is mentioned in the South African government's *Draft White Paper on e-Education* (S/A, 2004) and its Nigerian equivalence (FGN, 2001). In these draft policy documents, IT is said to have the "potential to improve quality of education and training,'' specifically naming the healthcare sector and education as areas where development needs to take place. This is the expectation worldwide. A survey in Australia conducted by Webster, Davis, Holt, Stallan, New and Yegdich (2003**:**144) to provide base-line data about nurses' use of the information retrieval systems in the hospital revealed that approximately 75% of them used a computer at home and 76% felt confident enough to type their CV on a computer. It also revealed that computer use was influenced by education, nursing seniority, age and length of time in the service while to a lesser extent it is also influenced by gender. Similarly, Fernandez et al. (2011**:**33) opined that faculty and students generally appreciate having immediate access to current clinical information with the use of PDAs. Their findings from the literature indicate that PDA use in the classroom and in clinical settings has become more prevalent. This aligns with George, Davidson, Serapiglia, Barla, andThotakura's(2010**:**371) findings that nursing students use PDAs for both classroom and clinical activities and also as a drug reference software.

The newest of the technology to emerge in recent times is the "social media". It is gaining popularity among healthcare professions including nursing. Barry and Hardiker (2012) in their global analysis of the use of the social media in advancing healthcare in the United Kingdom (UK) found an estimated 355,000 registered nurses and midwives on Facebook in the UK alone. The number of nurses and midwives using Facebook worldwide based on this fact would be up to several millions by now, they rightly observed. Nursing research is increasingly using social media to communicate with current, past and potential students to connect and share information (Amerson, 2011**:**414). Web 2.0 can also be useful in creating electronic portfolio for institutional assessment (Lin & Shen, 2012; Maag, 2005**:**16). Nurses use on-line databases to stay up-to date on current research and can make decisions on that research, thereby improving the possibility of health care (Ainsley & Brown, 2009). This aligns itself with the Olatokun (2008**:**281) studies regarding electronic mail use in research collaboration in Nigeria which show that apart from email contributing highest to job satisfaction among users, it is used in research collaboration.

2.7 Challenges in the Use of ICT

In spite of the benefits derived from the use of ICTs, a number of challenges are encountered by users. A challenge is defined by the Merriam-Webster on-line dictionary is "a test of one's ability or resources in a demanding but stimulating undertaking" (*Merriam-Webster*, 1995). Challenges in this study therefore refer to difficulties in the form of unavailability of skills infrastructure, software, hardware, technical or managerial support that hinder the full performance of a task.

The application of technology in teaching and learning is influenced by factors such as availability, cost and accessibility (UNESCO, 1998**:**33; 2007**:**1). In order to make use of digital ICTs, schools have to be equipped with computers and access to the Internet from a computer. This can be by direct cable network or through a modem.

Iranian university teachers strongly agree with the educational benefits of ICTs in higher education (Zare-ee, 2011:318). In spite of this, they reported infrequent uses of ICTs for research and instruction due to limited resources and facilities, insufficient skills, lack of time for initial preparations and policy-makers' little support and encouragement. Same hindrances were discovered by (Okiki, 2012:5; Oshinaike & Adekunmisi, 2012:61).

Cost was reported as one of the most serious of problems facing university teachers in the use of ICTs. This was identified by Anekwe and Ifeakor (2011:508) as one of the major factors which can frustrate the adoption and use of ICT for knowledge creation in Nigeria. Also, Aguele (2007:177) identified a host of other issues that included infrastructure, curricula changes, teacher training and technical support, which constitute some of the major challenges facing successful implementation of ICT in the whole Nigerian educational system. Furthermore, Goyal et al. (2011:64) and Eseza, Isah and Emunemu (2010:88) identify the key issues that could pose challenges to ICT use as lack of national policy and plan, the problem of bandwidth and its high cost and the problem of faculty staff resistance to change in curricula and pedagogical approaches. Equally important are the complaints from teaching staff regarding lack of adequate incentives and rewards which makes them reluctant to do anything extra to basic duties such as implementing ICT in teaching and learning.

Other problems relate to staff retention, lack of computer literacy skills among staff as well as mere resistance to change. People will always like to stick to what they are used to and find it difficult to accept new changes in their work places. Academic faculty members of staff accustomed to more traditional modes of instruction may be resistant to change their methods (Glenn, 2008:4). In a study of the barriers to the use of Information and Computer Technology by Australian nurses, age, confidence and knowledge were seen as some of barriers that hinder the rapid adoption of ICT (Eley, Fallon, Soar, Buikstra, & Hegney, 2010:1155). They noted from their previous studies that the longer serving nurses especially hospital-trained before computers were the norm, are more likely to lack the ICT skills and

therefore their confidence diminishes more than that of the more recently trained nurses. This study agrees that ICT training and education is essential for nurses in order for them to offer high-quality and efficient health care. Technical support was also identified as an important consideration for ICT use. Competency standards in computer use by nurses in order to reap the gains of this technology were recommended in that study. This is supported by Venkatesh, Morris, Davis and Davis(2003), Unified Theory of Acceptance and Use of Technology (UTAUT) which identifies some of variables which influence interactions with technology to include gender and age. There is belief that differences in gender and age can be significant factors in technology absorption. Age difference within faculty will be considered whether it has some impact on technology use in this study. On this basis, Skiba et al. (2008**:**228), notes that the problems faced by most technology users are universal especially in teaching with and about technology. This is why most educators seem to be still struggling to use technology in nursing courses. The Federal Republic of Nigeria in 2001 identified "reliable infrastructure, skilled human resources, open government thinking and other essential issues of capacity building" as some of the challenges that need to be addressed in order to reap the full gains to be brought by this new technology (FGN, 2001).

Concern was raised by Skiba et al. (2008**:**228) in a study undertaken on behalf of the National League for Nursing on faculty lecturers and administrators in schools of nursing in the USA. The study revealed that computer competency and information literacy is not addressed in almost 50% of schools in America, although it is made an integral part of the school curriculum. It went further to say that informatics competencies were often confused with computer and information literacy skills. In this context, Warren and Connors (2007**:**58) also raised some concern about informatics in nursing not being fully integrated into the nursing curriculum. The importance of competency in ICT cannot be over-emphasized as it can greatly assist in the management of patients and reduce errors of administration, as well as supporting clinical decision-making processes they observe. To address this challenge, the

American Association of Colleges of Nursing identified competency in the use of information systems and patient care technology to be an essential component of doctoral education for advanced nursing practice.

2.8 Theoretical Framework

This study is based on Venkatesh's et al. (2003), UTAUT model. This model explains how perceptions of own capabilities affect decision making. This is known as self-efficacy, which has been shown to greatly influence the effort exerted towards a task and the resilience shown towards its successful accomplishment. UTAUT also addresses how the issue of individual differences can determine the acceptance and use of technology. Through an empirical study, four recurrent constructs emerged that form the base of the development of the UTAUT (Pynoo, Devolder, Tondeur, Van Braak, Duyck, & Duyck, 2011**:**569). This provides a tool for managers of organizations to understand the likelihood of success for new technology introductions and help them to be proactive in attending to the factors which will influence or hinder an individual to adopt technology.

2.8.1 The Constructs of UTAUT

The four constructs of UTAUT are:

1) Performance Expectancy: This is a person's own belief that new technology will improve his/her task accomplishment. Technology is based mainly upon this premise.
2) Effort Expectancy: This is the degree of ease that is associated with the use of the new technology.
3) Social Influence: It measures the degree to which someone important to a person can influence his or her decision to use new technology.
4) Facilitating Conditions: These constitute the support that is available to facilitate a person's use of the new technology.

These four variables affect the intention to use and predict technology usage. Furthermore, a comprehensive model which vividly explains the interaction between these variables like gender, age, experience and voluntary use of technology is explained by the theorists.

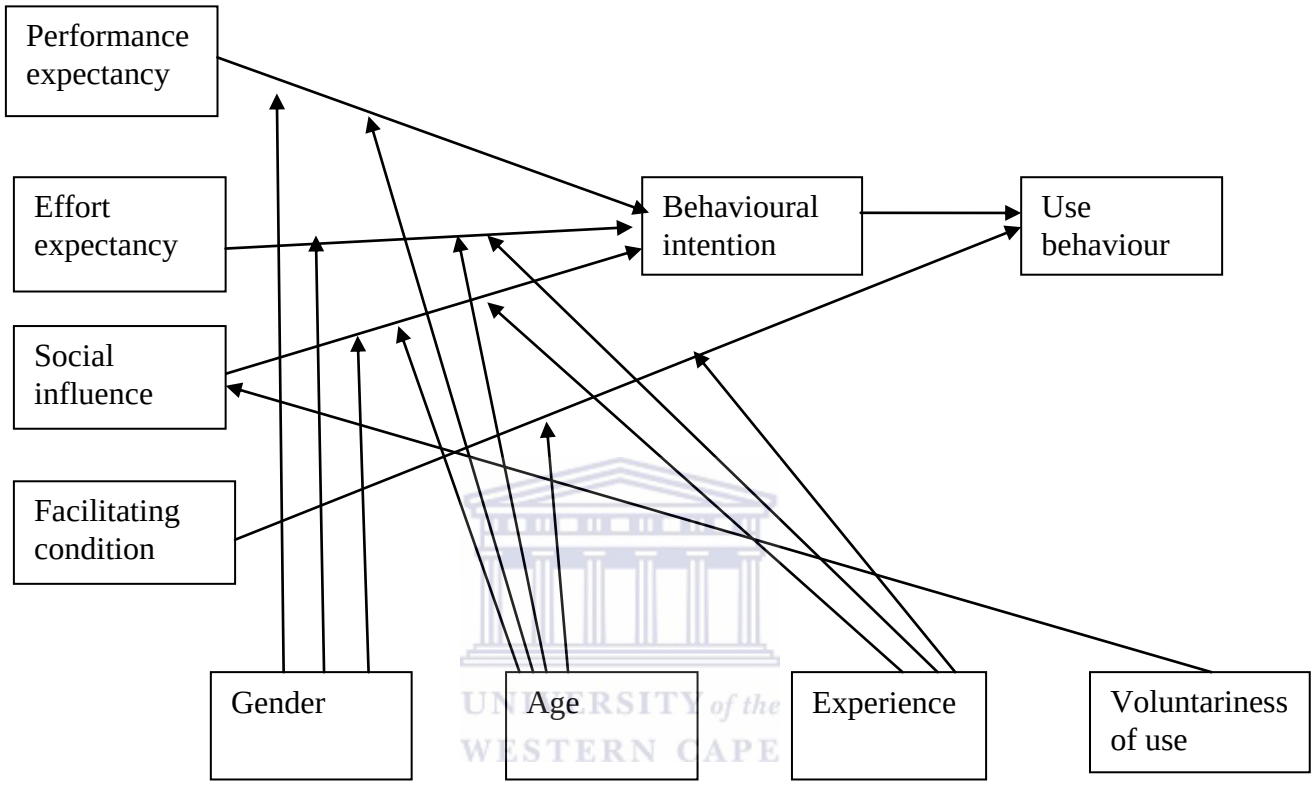

Figure 2.1: Venkatesh UTAUT MODEL 2003

2.8.2 Performance Expectancy

This is influenced by gender and age. Men tend to be more task-oriented than women who are softer in their approach to task completion due to their socialization history from birth rather than due to gender per se. Similar to gender is the age factor. This is theorized to play a moderating role in technology acquisition. Younger workers may find it easier to place more importance on extrinsic rewards, while the older ones have problems with new technology adoption. Increased age has been shown to be associated with difficulty in

processing complex stimuli and allocating attention to information about the job (Venkatesh et al., 2003).

2.8.3 Effort Expectancy

Effort Expectancy and Performance Expectancy explain the factors that influence technology more than the other factors. In fact, this is the main reason why a person may choose to use or not to use technology. Effort expectancy is influenced by gender, age and experience. It is said to be more salient for women than for men. The differences predicted in gender could be as a result of gender roles. Experience will be stronger, especially at the earlier stages of use. Difficulties are expected to ease out with time (Venkatesh et al., 2003).

2.8.4 Social Influence

Social influence is affected by gender, age, experience and voluntary use in such a way that older women, particularly in mandatory settings, are more likely to be affected than their male counterparts in the early stages of experience (Venkatesh et al., 2003). Individuals' behaviours are influenced by the way in which people believe others perceive them if they use technology. Women tend to be more sensitive to other people's opinions and therefore may find social influence to be very important when forming the intention to use new technology. Therefore, in mandatory settings like universities where lecturers are expected to possess technology skills and adapt newer methods of teaching, social influence is likely to be important because it has the ability to reward those who can use technology. That is probably why some lecturers think of the incentives for learning to use ICT to enhance their teaching and learning (Aguele, 2007**:**177).

2.8.5 Facilitating Conditions

These conditions could be structural, technical or managerial facilities that are expected to ease the use of technology. They are directly related to use behaviour and are greater than behavioural intentions. User behaviour is affected by age and experience in such a way that the influence is stronger for older workers. Ease of technology use is expected to increase with experience as users of technology are aware of various avenues to seek help and support which are available throughout the organization. This removes hindrances and leads to sustained usage.

2.8.6 Application of the UTAUT Model

Chiu and Eysenbach (2010**:**1) used this model to explore some of the factors that are associated with technology uptake and use of an Internet-mediated intervention for caregivers of a family member with dementia in China. A multi-phase, longitudinal design was employed to follow a convenience sample of 46 family caregivers who received an e-health intervention. Results showed that in the Consideration Stage, caregivers who felt that the information communication technology (ICT) -mediated service was easy to use were more likely to consider participating in the study (Chiu & Eysenbach, 2010**:**7). Similarly, the model was used by Oye, A.lahad and Ab.Rahim (2012**:**86), to investigate the acceptance and usage of ICT by the University of Port Harcourt (UNIPORT) academic staff with the main objective of examining the factors associated with ICT acceptance and usage and to measure the most influential factors. The result shows that the behavioural intention to accept and use ICT by the academic staff is a function of various concepts, including the understanding that educational ICT is useful and not difficult to use. The study confirms that the most influential UTAUT constructs influencing the behavioural intention of the academic staff to accept and use ICT is Effort Expectancy (EE). Contrary to these findings is that of Pynoo et al. (2011**:**568) who used UTAUT to investigate secondary school teachers' acceptance of a

digital learning environment in Belgium. Their study revealed that Performance Expectancy and social influence by superiors were the main considerations. Effort Expectancy and facilitating conditions were of minor importance.

The idea in this model (UTAUT) has been applied to the context of this study based on the premise that if nurse educators believe that the new Information Communication Technology service is easy to use and finds it useful in improving their task, coupled with their social expectations from significant others like peers, students, colleagues and management, then the technology will be used. Furthermore, they will be encouraged if there were assurances of the availability of facilities in the form of infrastructure and technical support which are paramount to technology adoption.

The following constructs guided this study;

1. *Facilitating conditions*: equipment, resources and support from management, training and access to ICT.
2. *Acceptance of technology*: was measured by the regularity of use of the technology.
3. *Behavioural intension:* was measured where the technology has already been introduced or where there is planning towards its introduction.
4. *Use:* was measured by self-reported frequency: this is implied by regularity of use through acceptance of technology.

2.9 Conclusion

This chapter identified the types of ICTs used in education in general and nursing education in particular by tracing the historical perspective to the present day. Instructional technology began in the 1990s in the form of diagrams in textbooks and has grown since then into more sophisticated electronic media such as computers and social media. It was necessary to classify and identify the most frequently used form of ICT such as the classical media like the CD, DVD and radio. Other technological media include cell phones, emails

and web 2.0 social media. The chapter examined various ways into which ICTs are used to improve learning. These include supporting conventional classroom work and its capability of enabling sharing of knowledge and using new sources for learning. This makes the world a global village as educators and students are able to interact and form communities either locally or internationally. ICT in the Nigerian context was examined and is found not different from other developing African countries. Even though the country adopted ICT late in its economic life, it is making tremendous progress because university lecturers including nurse educators embraced the use of ICT in their classroom to enhance lessons. The nurse educators should be facing the same challenges as other educators which are described as universal in nature since they are not peculiar to them. The UTAUT model can be used to explain the reasons why individuals may choose to use or not use technology.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section describes the methods and procedures used in the study. The research design is a quantitative approach using the exploratory survey method. The setting in which the research was undertaken is described, including the population and the size of the sample. The concept of reliability and validity is also discussed within the context of the design of the questionnaire. The procedure used to collect and analyze the data is also presented. Finally, the ethical issues considered during the study are explained.

3.2 Study Research Design

The study used an exploratory descriptive quantitative research design that entails the survey method for data collection with the aid of questionnaires. Quantitative research is "a formal, objective systematic process in which numerical data are used to obtain information about the world" (Burns & Grove, 2009**:**22). In this design, the focus is to describe what is happening to the samples or variables, examine relationships among variables without an attempt to manipulate or control them. Moreover, this method is economical with respect to time and cost of carrying out the research and helps to describe attitudes, opinions, behaviors or characteristics of the population. It also has the advantage of measuring current attitudes or practices (Bowling, 2005**:**281). A descriptive survey method of data collection technique is used in this study as it allows self-report of information desired by the researcher from the respondents.

3.3 Study Setting

The study was carried out in the nursing departments of the three universities in Edo State of Nigeria that offer Bachelors in Nursing Science programmes.

3.4 Study Population and Study Sample

McMillan and Schumacher (2006**:**119) define a population as a group of elements or cases whether individuals, objects or events that conform to the specific criteria to which we intend to generalize results.

The population for this study consisted of all nurse educators that teach in a university nursing department or school in Edo State, Nigeria irrespective of whether they are government or privately owned institutions. Research textbooks provide guidelines on the appropriate sample sizes for different population sizes in order to achieve accuracy, validity and reliability. The smaller the population, the larger the sample has to be (Neuman, 2007**:**242). But, Stoker et al (1989**:**130) points out that the more homogeneous the population elements, the smaller the sample may be. The sample size was determined by the number of nurse educators in these universities. The total number of nurse educators in the nursing departments of these universities is 36 (P=36). This population equally constituted the researchers' sample of N=36 because of its size. The universities that participated in the study were:

- University A
- University B
- University C.

3.5 Data Collection Procedure

Letters requesting permission to collect data from the various nursing departments were delivered personally by the researcher to the various universities' managements through the HOD except in university A where the request was sent to the faculty's research ethics committee as a laid down procedure.

The data was collected in the month of July 2013. It was appropriate as it was the middle of the first semester. All the lecturers were available except in University B where one lecturer was on study leave outside the country. Verbal accent was obtained after a thorough but brief explanation of the study to the participants. Consent forms were duly filled, followed by the issuance of a copy of the questionnaire to each participant. Those who were not immediately present at the briefing or not found in their offices had their questionnaires, information sheets and consent forms put in sealed envelopes and given to the HODs for onward transmission to them. Follow-up telephone calls were made to remind the remaining participants to fill the questionnaires. The participants later responded and returned the completed questionnaires to the co-coordinating lecturer appointed by the HOD in each university from whom they were collected by the researcher after three days. Only one participant declined to participate in the study in one of the universities and she did not give any reasons. Figure 3.2 gives a pictorial view of the data collection procedure from the three institutions that participated in the study

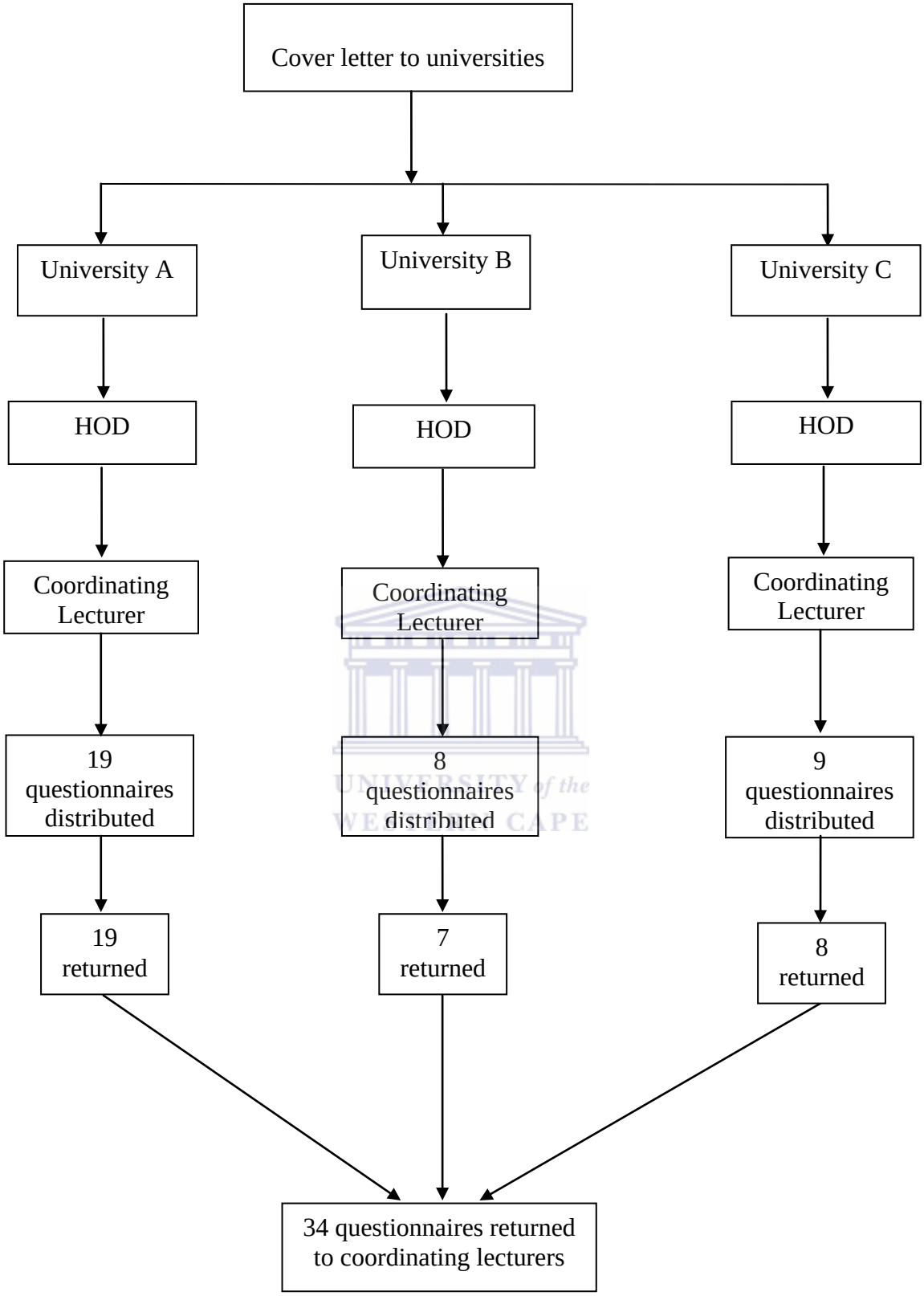

Figure 3.2: Data Collection Procedure

3.6 Instrument Design

Data collection was achieved through a self-administered questionnaire developed by the researcher because a reliable and validated instrument could not be immediately found for this study. The questionnaire was based on literature searches relating to questionnaire construction and designs. Synodinos (2003) discussed the development and construction of a good questionnaire with the following considerations;

1) Researcher understands the topic very well and pays attention to details and wording and instructions.
2) To make respondents respond adequately, possible factors that could influence response rate should be noted e.g. questionnaire format. Open-ended questions have been found not easy to respond to.

In line with the above caution, some major points which were suggested by Synodinos (2003) was given adequate consideration to improve the construction and ultimately the response rate of the questionnaire.

- Response choices specify ranges instead of specific values.
- Questions were presented in sequence and alphabetical order to capture research objectives.
- Questions were such that all respondents have enough information.
- Questions were tailor-made to suit the respondents.
- Information required was easy to access by all respondents and were non-intrusive.
- The questions had a professional outlook and were easy for respondents to complete.

The questionnaire was divided into five sections based on the different areas in which information was sort which would satisfy the objectives of the study. The areas covered are:

- Demographic information of the nurse educators.
- Types of ICTs used by nurse educators.
- How nurse educators use ICT.

- Challenges faced by nurse educators about the use of ICT.
- Suggestions on how to address the identified challenges.

The questionnaire was written in English with simple format that required a "Yes "or "No" answer. Respondents were also expected to choose from a list of options the type of ICTs they used. A Likert scale was produced with options of "Most often," "Very often," "Often," "Sometimes" and "Not at all." This scale was used to decipher the respondents' regularity of ICT use. According to McMillan and Schumacher (2006**:**198) and Burns and Grove (2009**:**407), scales which follow after the simplest response set of "Yes''/"No" allow a fairly accurate assessment of beliefs and opinion while the open-ended questions allow the least of control over the respondents which makes it possible to capture their differences.

The last section had an open-ended question which was intended to get respondents' suggestions on how to solve the challenges they identified. The aim was to allow respondents to express themselves in their own words so as to obtain a deeper understanding of their ideas and concerns regarding the challenges.

The questionnaire method of data collection was chosen because it has the added advantage of reaching out to a larger group of people in less time as well as providing respondents with some sense of anonymity, thereby providing honest answers. Moreover, the format is standard and independent of the mood of the researcher (Brink, Van Der Walt, & Van Rensburg, 2010**:**147). But they noted that the questionnaire method can be fraught with disadvantages which include low response rates, ensuring that the population sample is literate or speak a common language as well as having the problem of respondents providing socially acceptable answers. However, these disadvantages did not apply to the study because the population that was chosen was highly literate. The nurse educators spoke a common language (English) and were contactable because they all work and reside in the towns or cities where the universities are located.

Errors can occur in surveys in a variety of ways, common among them are sampling errors and population bias (Burns & Grove, 2009**:**346). A survey of the entire population was undertaken in order to reduce sampling errors and reduce the consequences of a high rate of non-response. This was also done due to the small nature of the population. Nurse educators are among the scarce manpower in the whole health sector today, especially in developing countries (Booth, 2002**:**399). Another common error in the questionnaire design is possible ambiguity and lack of clarity of the questions. These errors were reduced by inclusion of a cover letter that explained the purpose of the study in detail as well as making use of simple language throughout the questionnaire construction. Data capturing errors were reduced by consulting a statistician who advised on the use of the appropriate data capturing techniques to reduce inappropriateness of the method of data analysis.

To ensure a high response rate, a number of strategies were adopted, which included personally approaching the faculty members, with the assistance of the HODs, to explain the nature of the research and request for their cooperation. Visits were scheduled on the days of staff departmental meetings in two of the universities (University A and B). The relevance of the study was explained verbally and in written form. This was meant to give participants an insightful understanding in the form of an information sheet. This positively affected the response rate. By being explicit about how data was going to be collected, most of the nurse educators understood what the study was about. The only thing left was whether respondents were going be honest when filling the questionnaire by not providing socially acceptable answers. This is known to be a disadvantage of the questionnaire method of data collection (Brink et al., 2010**:**147).

The questionnaire began with the simple questions seeking information on the demography of respondents. This was to ensure that their interests and historical information could be captured because demographic information can shed more light on the nature of responses provided. However, Burns and Grove (2009**:**408) recommend that the general

trend is to obtain this information at the end. Loaded questions were avoided and simple language was used throughout the questionnaire, ensuring that any technical jargons was avoided so as not to intimidate or threaten the respondents since this was an area that most respondents are not very familiar with or comfortable in. Where technical terms had to be used, an example was given in the sentence in bracket form to enable respondents have the necessary information they needed to give the accurate response.

Two nursing academics and an ICT academic in the Information and Communication Service department and a statistician in the University of the Western Cape were consulted for their inputs, rating and suggestions. Before the development of the final draft of the questionnaire, a pilot study was carried out.

3.6.1 Instrument Reliability and Validity

Reliability denotes the consistency of a measure by an instrument. Parameters such as test retest, inter-rater reliability and internal consistency must be addressed and found satisfactory before an instrument can be declared reliable (Johnson & Christensen, 2010**:**139). The Cronbach Alpha Coefficient was used to evaluate the instrument reliability. Santos (1999) states that Cronbachs' Alpha estimates the internal consistency or correlation of items in a question. Results of the four variables tested are as follows:

Table 3.1: Cronbachs' Alpha Reliability Estimate of Variables

SN	Items	Cronbachs' Alpha estimate
1	Types of ICT	0.846
2	Frequency of Use of ICT	0.855
3	How ICTs are Used	0.947
4	Challenges	0.764

Table 3.1 shows the Cronbachs' Alpha reliability coefficient of the four variables in the study. All the estimates are above 0.7 which is acceptable as high (McMillan & Schumacher, 2006**:**187).

3.6.2 Validity

Validity means the extent to which an instrument actually measures the construct regardless of the administrator of the instrument (Burns & Grove, 2009**:**377). There are many types of validities that can be employed to measure an instrument, for example, content, face, criterion and construct validity. Content validity considers the sampling adequacy and the representativeness of the content to be covered by an instrument (De Vos, Strydom, Fouche, & Delport, 2005**:**160).

To ensure content and face validity, nursing and ICT experts in the University of the Western Cape were consulted to assist in the evaluation and rating of the questionnaire to ascertain that it measures the targeted construct. The experts made no additional changes to the instrument, thus confirming its face validity. Criterion validity was ensured by extensive literature search which provided a basis for each item on the instrument as it is in line with the research aims and objectives.

3.6.3 Pilot Study

A pilot study was used to ensure stability of the instrument and also serve as a pre-test. McMillan and Schumacher (2006**:**138) describe a pre-test as a procedure that precedes a treatment or experience that helps to refine the instrument of the proposed study. In the same context, van Teijlingen and Hundley (2001**:**1) define a pilot study as "a small scale version of a full scale study". It takes the entire study into consideration but uses a small sample of the target population in the same study setting. Brink et al. (2010**:**166) opined that the aim of a pilot study is to investigate the feasibility of the proposed study and to detect possible flaws in the data collection instruments. Furthermore, it enables the researcher to avoid any pitfalls in the study's collection of data by giving insights into unexpected problems and gain experience with the data before the actual implementation of the study.

A study that entailed administering the instrument to 5 nurse educators in Delta State University, Abraka was undertaken in the same conditions as the ones in Edo State Universities. Delta State is a neighboring state located in the South-South zone of Nigeria. It is bounded on the north by Edo State. The state was carved out of Edo State (then known as Bendel State) in the July 1991 (www.nigeriagalleria.com). The Bachelor of Nursing programme has been approved in this university since 2008 by the Nursing Council of Nigeria as well as the National Universities Commission (NUC).

The reasons for carrying out the pilot study in another university are, first, to avoid contaminating the sample. Secondly, doing otherwise will reduce the sample size since the population of nurse educators is sparse. These participants were asked to indicate if they had any difficulty in understanding the questionnaire's instructions or the meaning of the words in the questionnaire. The participants indicated that they had difficulty in answering some of the questions even though the instructions were clear. For example, the electronic blackboard 5 was confused with the ordinary chalkboard. This necessitated some modifications that led

to the outright removal of two questions. In addition to the afore-mentioned issues, the researcher was able to gain insight into the possible difficulties that would be encountered in administering the questionnaire. This awareness made the researcher to seek the advice of the HODs on the best ways to reach the lecturers for data collection. The week-day that the department holds scheduled meetings with the lecturers was suggested as the best time to meet most, if not all, the lecturers. This worked very well in University A, but the lecturers where approached individually by the researcher through the HOD and liaison lecturer in Universities B and C.

3.7 Data Analysis Method

Data collected from the respondents were captured on receipt of the questionnaires. Each questionnaire was given a code number so that it would be easy to compare it against the original questionnaire during the data cleaning process. All the data collected was entered into SPSS 21 twice to check if data was entered correctly. There were 34 questionnaires and they were all completed properly with no incomplete sections. They were thereafter analyzed using descriptive measures to describe findings in frequency tables, graphs and percentages. Brink et al. (2010**:**171) states that descriptive statistics is used to describe and summarize data. They convert and compress large collection of data into an organized whole or picture in a variety of ways that makes it possible for the readers of the research report to grasp the meaning.

Also, bivariate analysis was carried out to ascertain the association of demographic variables with the use of computers and the level of significance was set at $p<0.05$. The questions in Likert scale format were coded as Most Often=4, Very Often 3, Often=2, Sometimes=1, and Not At All=0 to give the weight of each response and the total score was then used to ascertain which of the ICTs they used more regularly than others.

3.8 Ethical Considerations

To conduct the research, permission was obtained from the University of the Western Cape's Senate Higher Degrees' Committee, as well as the three universities where the study was carried out and the nursing departmental heads (See Appendix A-D). Advance meetings were held with the HODs where the study was to be conducted and the method of data collection was explained in detail to participants. The purpose was to gain their co-operation and make it easy to reach out to the respondents and gain their acceptance. Moreover, it made it possible to ensure that all the lecturers were well-informed. In respect of the adherence to the fundamental rights principle of the participants, the study paid serious attention to the following:

Respect for person: All subjects were treated as autonomous agents as they were well-informed that their participation in the study was voluntary and that they had the right to withdraw from the study any time without a penalty.

A right to protection from discomfort and harm: While risks in participating in the study are not obvious, everything was done by the researcher to adequately take care of any emotional trauma the participants may suffer. Maximum attention was therefore paid to the following aspects of the study. The researchers' email and postal addresses were provided on the cover letter to enable easy contact in case any respondents needed more information.

Privacy; Privacy refers to the subject's right in determining the time, extent and general circumstances under which his/her present information is shared with or withheld from others. An explanation was given to the respondents that the information would be available only to the researcher, the supervisor and the statistician. Conversations between the researcher and the subjects remained confidential.

Anonymity: This was ensured by not asking for subjects' identities as no names were required on the questionnaire when it was returned and their identities were kept secret regarding participation in the study. Only code numbers were assigned to the copies of the questionnaire so that the subjects' identities would not be linked to the responses. The subjects' identities remain secret with regard to their participation in the study.

Confidentiality; Confidentiality is the researchers' management of private information shared by subjects that should not be shared with others unless with the authorization of the subjects. All the data gathered were available only to the researcher, the supervisor and the statistician. Codes A, B and C were assigned to the three universities to avoid responses being linked to them. All the responses to the questionnaire have been kept in a secure place under lock and key until after publication of the results and shall be destroyed after five years.

Fair Selection of Subjects: Fairness in the selection of the study population and the participants in particular was followed. No nurse (lecturer) was discriminated against. All the nurse educators participated in the study irrespective of their age, sex, social standing, religious and organizational affiliations, years of teaching or other academic achievements.

Obtaining Informed Consent: Consent for the study was implied because the participants filled and returned the consent forms included in the envelopes containing the copies of the questionnaire. This was after they had obtained and understood everything pertaining to the proposed study and questions posed had been answered. Detailed information on the aims, objectives and potential benefits of the study, how the data would be collected and the voluntary nature of their participation was given to the participants. Voluntary consent was obtained when the participant had demonstrated a clear understanding of the essential information provided.

3.9 Conclusion

This chapter described the methodology used by the researcher in carrying out the study. It described the setting in which the research was undertaken at the nursing departments of the three universities in Edo State that offer nursing degrees. The population was described as all the nurse educators of each university that had agreed to participate in the study while the sample is those who had completed and returned the questionnaire.

An explorative descriptive study design was chosen that utilized quantitative methods and which included an open-ended question. As no reliable validated instrument could be found, a self-administered questionnaire developed by the researcher was used. A pilot study was done to pre-test the questionnaire and it was refined based on the feedback from the participants.

Permission to conduct the research was obtained from the University of the Western Cape's Senate Higher Degrees' Committee as well as from the management and HODs of the three universities offering Bachelors in Nursing Science degree in Edo State, Nigeria. Contact was made with co-coordinating lecturers in each university to arrange for the distribution and collection of the questionnaires. Cover letters were given to all participants present at briefings as well as those who were not immediately available which provided background information on the aims and objectives of the study. The questionnaires were returned in sealed envelopes. The researcher captured the research data under the guidance of a statistician and the analysis of the data was performed using the SPSS (21).

CHAPTER FOUR

PRESENTATION OF THE RESULTS

4.1 Introduction

In this chapter all the findings of the study are presented using tables and charts. Each table is accompanied with a brief description and interpretation of the results which provide feedback on the types and uses of ICTs by nurse educators in Edo State, Nigeria. These findings also provide the researcher with the factors that could pose challenges to ICT use. The descriptive analysis is presented in frequency tables, and bar charts. Cross-tabulations were done to determine if any relationship exists between variables using the application of Chi-square analysis to statistically check for that association between the variables.

4.2 Realization of Data

4.2.1 Final Sample Size and Distribution of Respondents

The population of the study was all the nurse educators who are all lecturers in the three Universities in Edo State that offer the Bachelors in Nursing Science (BNS) programme. A total of thirty-six (36) copies of the questionnaire were distributed to the nursing departments of these three universities. All thirty-six (36) copies of the questionnaire were returned out of which two were not completed because one of the nurse educators was away on study leave, while the other declined to participate in the study. Thus, a total of thirty-four (34) copies of the questionnaire comprised the final sample size used for this study, indicating a response rate of 94.4%.

Table 4.1: Presentation of Final Sample Size (N=34)

University	Questionnaires Distributed to Each University (N=36)		Questionnaires Returned from Each University (N=36)		Response Rate by University (N=34)
	F	**%**	**F**	**%**	**%**
University A	19	52.7	19	52.8	100
University B	8	22.2	7	19.4	87.5
University C	9	25.0	8	22.2	88.8
TOTAL	36	(99.9%)	34	(94.4)	

F=Frequencies; %= Percentages.

Table 4.1shows the total number of copies of the questionnaire sent to the three universities that participated in the survey as well as the number of copies returned from each university. The copies were hand delivered in all the Universities. The highest rate was from the University A 19(52.8%).

4.3 Demographic Variables

4.3.1 Distribution of Nurse Educators on Demographic Variables

This section consists of demographic questions that provided the researcher with a description of the sample population. The researcher examined the following items: gender, age, institution, designation, number of years of practice and highest qualification attained. An analysis of the data provided the researcher with a better understanding of how nurse educators are distributed in these universities along these variables.

Table 4.2: Demographic Variables of Nurse Educators in Edo State Universities (N=34)

Variable	Type of Variable	Freq.	%
Gender	Male	9	26.5
	Female	25	73.5
Age group	20-29years	1	2.9
	30-39years	2	5.9
	40-49years	4	11.8
	50-59years	21	61.8
	60years and above	6	17.6
Institution	University A	19	55.9
	University B	7	20.6
	University C	8	23.5
Designation	Professor	1	2.9
	Senior Lecturer	7	20.6
	Lecturer I & II	16	47.1
	Assistant Lecturer	10	29.4
Years of Practice	Above 20yrs	10	29.4
	15-20yrs	6	17.6
	10-14yrs	2	5.9
	0-4yrs	11	32.4
Highest qualification	Bachelor of Nursing	7	20.6
	Masters in Nursing	12	35.3
	PhD	10	29.4
	0ther	5	14.5

F=Frequencies; %= Percentages.

Table 4.2 shows a summary of the results from the gender, age group distribution, institution, designation, and years of practice as well as highest qualification of nurse educators in universities in Edo State in Nigeria.

The majority of the respondents are females 25(73.5%), while the males are 9(26.5%). With regard to the age of the respondents, those in the age range of 50-59years are more 21(61.8%) while those who are 60years and above are 6(17.6%). There is only one lecturer 1(2.9%) within the age range of 20-29years. Thus, the mean age of respondents is 53.03. On the institutions, the University A had the highest number of nurse educators with 19(55.9%). Lecturer 1and 2 make up the highest percentage 16 (47.1%) in the rank of nurse educators in these universities closely followed by assistant lecturer 10 (29.4%). It is important to note that there is only one professor 1(2.9%) among the respondents.

With regard to the years of service, the nurse educators who have spent 0-4 years and above in practice make up 11(32.2%), followed by those who have spent over 20years 10(29.4%). The table equally shows the distribution of highest academic qualification among the respondents. The highest academic qualifications are the Masters' Degree with 12(35.3%) and the PhD 10(29.4%) respectively. Among the five (14.5%) respondents that answered *other* in this category, one of them is a medical doctor, while the other four have Masters' degrees in fields such as education, public health, public administration and health management. The remaining 7(20.6%) are graduate assistants.

Table 4.3: Gender Distribution in Institutions (N=34)

INSTITUTION	GENDER Male F (%)	GENDER Female F (%)	TOTAL=34
University A	2(10.5%)	17(89.5%)	19
University B	3(42.9%)	4(57.1%)	7
University C	4(50.0%)	4(50.0%)	8

F=Frequencies; %=Percentages.

Table 4.3 shows gender distribution of nurse educators in the universities in Edo State that offer Bachelors in Nursing Science. Females are seen to dominate the staff members' lists in two of the three institutions, especially in University A which has the highest number of 17(89.5%) females and only have two males (10.5%). University C is more balanced gender-wise with 4(50%) each of both male and female lecturers.

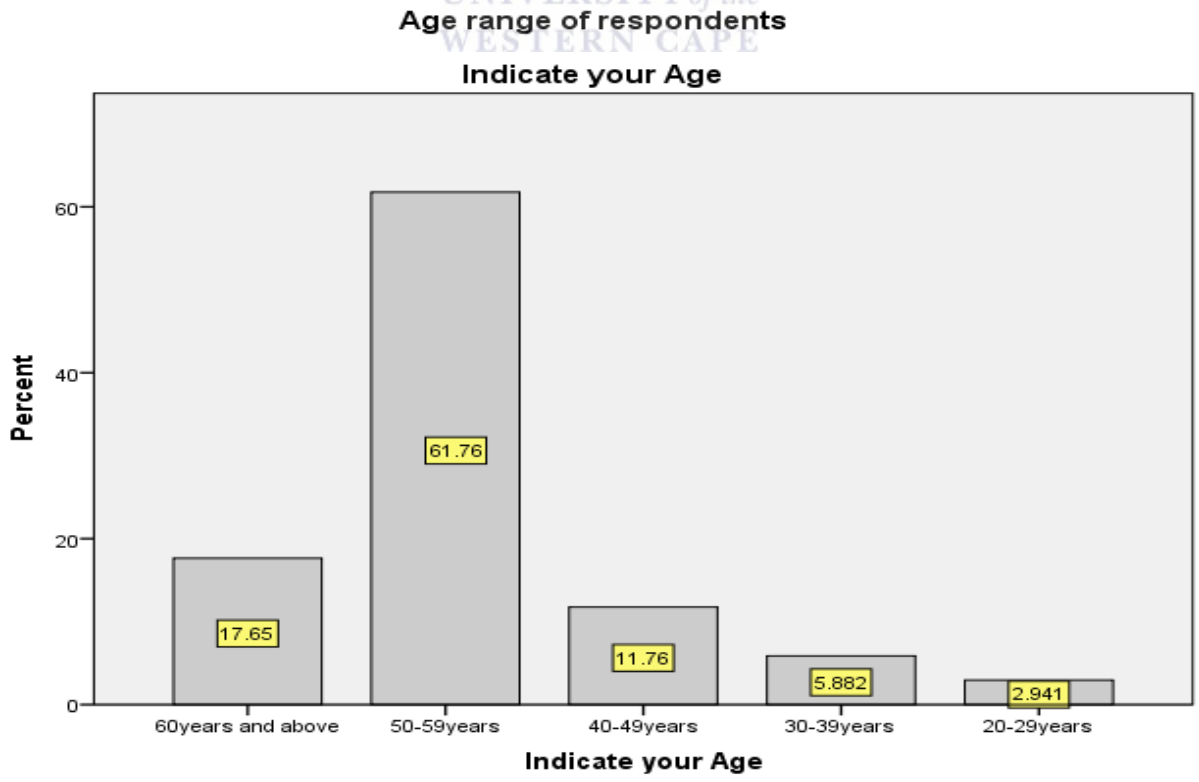

Figure 4.1: Age Distribution of Respondents

Figure 4.1 depicts the age range of nurse educators in Edo State Universities. The highest number is those in the age range of 50-59years 21(61.8%), while the least is in the range of 20-29yrs 1(2.9%).

4.4 Summary of Demographic Variables

This section gave a clear description of all the respondents in the study as regards demographic information. The results indicate that the majority of the respondents are females 25(73.5%). University A has the highest number of lecturers 19(55.9%). The respondents in the age range of 50-59years are more 21(61.8%) with the majority of them having a Master degree 12(35.3%) as their highest qualification. Lecturer 1 and 2 are more in number 16 (47.1%) just as the lecturers who have spent over 20years in the profession 10 (29.4%).

4.5 Objective One (a): Types of ICT Devices Used by Nurse Educators

This section is about the types of ICT devices that are used by nurse educators for teaching and learning at universities in Edo State. The respondents were provided with a list of ICT devices to choose from, and indicate as many types as they could, according to what they used. The ICT devices are presented in the form of hardware and software. The section also provides the researcher with the data on the types of ICT devices arranged in a descending order of use.

Table 4.4: Types of ICT Used by Nurse Educators in Universities in Edo State for Teaching and Learning (N=34)

S/N	ICT Types		Yes Freq (%)	No Freq (%)
1	**Hardware**	Laptop	34(100)	0(0.00)
		Computers (Desktop)	32(94.1)	2(5.9)
		Mobile Technology e.g. (Cell Phones & PDA)	26(76.5)	8(23.5)
		Audio-Visual	24(70.6)	10(29.4)
		Fax Machine	5(14.7)	29(85.3)
		Electronic Whiteboard	0(0.0)	34(100)
2	**Software**	Word, Spreadsheet and Presentation Software	33(97.1)	1(2.9)
		E-mail	25(73.5)	9(26.5)
		Audio-based	21(61.8)	13(38.2)
		Interactive Lessons on CD-ROMS	21(61.8)	13(38.2)
		Course-Related Software	20(58.8)	14(41.2)
		Web 2.0 Social Networking	17(50.0)	17(50.0)
		Chat (Yahoo MSN e.g. Skype)	11(32.4)	23(67.6)
		Video Conferencing	10(29.4)	24(70.6)
		Video Transmission	9(26.5)	25(73.5)

F=Frequencies; %=Percentages.

In Table 4.4, the number and percentages of the types of ICT devices used by nurse educators for teaching and learning in universities in Edo State are presented in descending order.

The laptop is the hardware that is mostly used by all the nurse educators, that is, 34(100.0%). This is followed by computers which are used by 32(94.1%). Mobile technology

such as the cell phones and Personal Digital Assistants (PDAs) constitute 26(76.5%) of users while the audio-visual accounts for 24(70.6%). The Fax machine enjoys the least patronage with only 5(14.7%), but the electronic whiteboard is not used at all 0 (0.0%).

Among the softwares that are used, Word, Spreadsheet and Presentation software top the list with 33(97.1%). Only 1(2.9%) nurse educator was found not using this technology. The e-mail follows with 25(73.5%) users and thereafter the audio-based 21(61.8%) and Interactive lessons on CD-ROMS 21(61.8%) respectively. Course-related software is used by 20(58.8%) of the respondents. Web 2.0, a social networking platform, is used by 17(50.0%), indicating that half of the lecturers use this mode of technology for teaching and learning. The number of respondents who use the software medium apart from the Fax machine depicts more than 50% applicability of these technologies.

A detailed breakdown of other ICTs is shown in the table. However, it is to be noted that Chat (e.g. MSN or Skype) is used by 11(32.4%), video conferencing and video transmission is used by 10(29.4%) and 9(26.9%), respectively indicating a poor applicability or non availability of these technologies.

4.5.1 Association between Computer and Demographic Variables

In Tables 4.5 and 4.6, the researcher aimed to determine whether there is an association between computer use and demographic variables. Cross-tabulations with Chi-Square test on all the items was done to determine if there was any statistically significant association between these items. The level of significance that was used in this study is 0.05. If the level is more than 0.05, then there is no association between the items.

Table 4.5: Distribution of Demographic Variables Cross-Tabulated against Computer Use (N=34)

Variable	Variable Names	Computers	Computers
		Yes **F (%)**	**No** **F (%)**
Gender	Male	9(100)	0(0.0)
	Female	23(92.0)	2(8.0)
Age	20-29years	1(100)	0(0.0)
	30-39years	1(50.0)	1(50.0)
	40-49years	4(100)	0(0.0)
	50-59years	20(95.2)	1(4.8)
	60years & above	6(100)	0(0.0)
Institution	University A	19(100)	0(0.0)
	University B	6.(85.7)	1(14.3)
	University C	7(87.5)	1(12.5)
Designation	Lecturer II & II	15(93.8)	1(6.2)
	Assistant Lecturer	9(90.0)	1(10.0)
	Senior Lecturer	7(100)	0(0.0)
No of Yrs. of Practice	0-4yrs	11(100)	0(0.0)
	Above 20yrs	10(100)	0(0.0)
	15-20yrs	5(83.3)	1(16.7)
	5-9yrs	4(80.0)	1(20.0)
	10-14yrs	2(100)	0(0.0)
Highest Qualification	Masters in Nursing	12(100)	0(0.0)
	PhD	10(100)	0(0.0)
	Bachelor of Nursing	5(71.4)	2(28.6)
	Other	5(100)	0(0.0)

F=Frequencies; %= Percentages.

Table 4.5 shows gender, age, institution, designation, number of years of practice and highest qualification achieved that are cross-tabulated against computer use by nurse educators in Edo State. All the 9(100.0%) males in the study use computer against 23(92.0%)

females. Two of the females, which represent 8%, do not use computers. Those in the age group of 50-59 years are 20 (95.2%) in number among the 21(100%) respondents in this category who use desktop computers. A close look at the table shows that all other age groups make use of the desktop computer as well.

On institutions, University A has the highest number of respondents with all 19(100%) of them making use of desktop computers. The other two institutions B and C have one (1) non-user each, that is, 1(14.3%) and 1(12.5%) respectively. These figures are not significant. Lecturers I and II make up the greatest number of computer users with 15(93.8%) out of 16(100%) respondents; while Assistant Lecturers are 9(90%) from the 10(100%) persons in this cadre. Though the Professors account for 100% users, it is observed that the number which constitutes this percentage is just one (1) person out of the 34 respondents.

The lecturers who have spent 0-4years who make use of desktop computers are 11(100%). This is followed by those who have spent above 20 years 10(100%). The number of non-users of computers is equally very small. They constitute only one or two persons in each category. But the same cannot be said of the highest qualification. All the lecturers with Masters in Nursing 12(100%) as well as those with PhD 10(100%) use computers, indicating that they are higher than the rest on the table. It should be noted that the 5 respondents who answered *other* are those with Masters degrees in other core areas like medicine and public health. Thus, the lecturers with Bachelors degrees who do not use computers is represented by 2(28.6%) in that category.

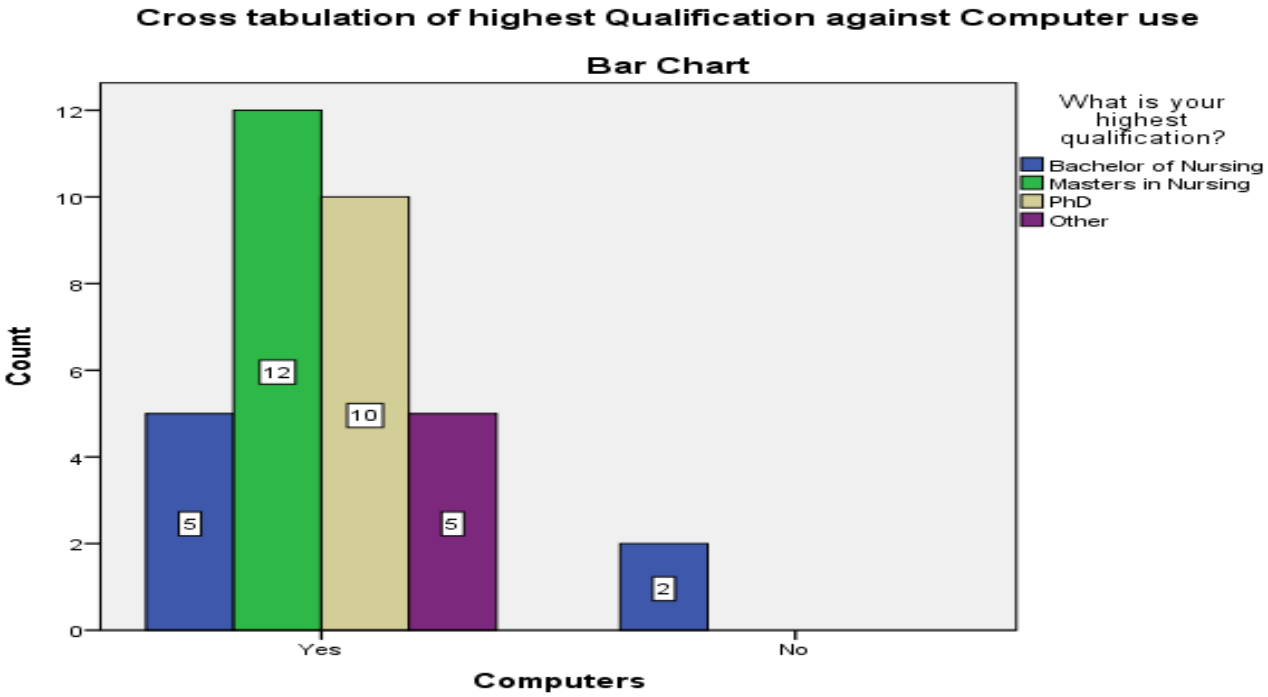

Figure 4.2 Cross-Tabulation of Highest Qualification against Computer Use

Figure 4.2 shows the highest qualification of nurse educators in Edo State universities cross-tabulated against computer use. Those who possess the Masters degree are more in number 12(35.2%), while the least are those with Bachelors degree in nursing 7(20.5%). In this latter category, 5(14.7%) use computers while 2(5.9%) do not.

Table 4.6: Association between Demographic Variables and Computer Use

	Computer		
Demographic variable	χ^2	PV*	NS
Age	7.766	.101	NS
Gender	.765	.382	NS
Institution	2.713	.258	NS
Designation	.810	.847	NS
Years of Practice	4.498	.343	NS
Highest qualification	8.196	.042	S

*Significance level: 0.05; NS=Not Significant; S=Significant, PV = p-value

When the researcher ran the Chi-Square (χ^2) analysis on the demographic variables against computer use, all the P values were found to be above the confidence limit of 0.05 except for highest qualification (see Table 4.6); therefore, no further analysis was done**.**

4.5.2 Summary of Types of ICTs

The analysis in this section shows that the Laptop, Word, Spreadsheet and Presentation softwares, desktop computers and mobile technology such as the cell phones and Personal Digital Assistants (PDA) are the ICT devices that are mostly opted for by nurse educators. The respondents with the highest qualification were shown to use computers more when the computer was cross-tabulated against the demographic variables. Other variables did not show any significant association at 0.05 confidence limit.

4.6 Objective One (b): Regularity of Use of ICT by Nurse Educators

This section concentrates on how often nurse educators use the ICTs listed on the questionnaire. The questions are in a Likert scale of Most Often=4, Very Often 3, Often=2, Sometimes=1, while Not At All=0. The results are presented in a descending order.

Table 4.7: Regularity of Use of ICT by Nurse Educators (N=34)

Types of ICTs	Most often	Very often	Often	Sometimes	Not at all	Use Weighting
	F (%)	F (%)	F (%)	F (%)	F (%)	
Laptop	11(32.4)	8(23.5)	8(23.5)	7(20.6)	0(0.00)	90
Computers (Desktop)	7(20.6)	10(29.4)	8(23.5)	6(17.6)	3(8.8)	80
Mobile Technology e.g. (Cell Phones & PDA)	9(26.5)	5(14.7)	6(17.6)	7(20.6)	7(20.6)	70
Word, Spreadsheet, etc.	3(8.8)	3(8.8)	13(38.2)	14(41.2)	1(2.9)	61
E-mail	7(20.6)	4(11.8)	5(14.7)	9(26.5)	9(26.5)	59
Audio-Visual	7(20.6)	1(2.9)	10(29.4)	7(20.6)	9(26.5)	58
Audio-Based	5(14.7)	6(17.6)	3(8.8)	7(20.6)	13(38.2)	51
Course-Related Software	3(8.8)	8(23.5)	4(11.8)	5(14.7)	14(41.2)	45
Interactive Lessons on CD-ROMS	1(2.9)	6(17.6)	7(20.6)	8(23.5)	12(35.3)	44
Web 2.0	2(5.9)	1(2.9)	3(8.8)	9(26.5)	19(55.9)	26
Chat e.g. Skype	0(0.0)	2(5.9)	1(2.9)	8(23.5)	23(67.6)	16
Video Transmission	1(2.9)	0(0.0)	1(2.9)	6(17.6)	26(76.5)	12
Video Conferencing	1(2.9)	0(0.0)	1(2.9)	6(17.6)	26(76.5)	12
Fax Machine	0(0.0)	1(2.9)	1(2.9)	4(11.8)	28(82.4)	9

Most Often=4, Very often=3; Often=2, Sometimes=1, Not at all=0, N Frequencies; % Percentage.

Table 4.7 presents the regularity of use of ICT by nurse educators in universities in Edo State for teaching and learning. The ICT medium is presented in a descending and weighted order of priority by the respondents. The table shows that the laptop tops the list with use weighting of 90 points. A handful of the nurse educators use the laptop most often

11(32.4%). It is used very often and often by 8(23.5%), while 6(17.6%) use it some of the times. Only 1(2.9%) respondent does not use the laptop at all. The ever-present computer (desktop) follows and has a use weighting of 80 points with 7(26.6%) users using it most often, 10(29.4%) very often, 8(23.5%) often and 6(17.6%) some of the times. Mobile technology like cell phones and PDA follow closely with 70 points and with 9(26.5%) users using it most often, often by 6(17.6%) ; seven (20.6%) use it some of the times while the same number say they do not use it at all. Word, Spreadsheet and Presentation software have a use weighting of 61 and are used by 3(8.8%) most often or often, while 13(38.2%) often use it and 14(41.2%) use it some of the times. The e-mail is used most often by 7(20.6%), with 4(11.8%) using it very often, 5(14.7%), while 9(26.5%) of the respondents use it some of the times. Though it has a use weighting of 59 points, 9(26%) respondents do not use it at all.

On the table, the audio-visuals are weighted 51 and are used by 7(20.6%) most often, with 10(29.4%) of the respondents using it often and 7(20.6%) using it some of the times. The percentage of non-users of audio visuals is high 9(26.5%) when it is compared with the overall figure. Audio-based technology is used most often by 5(14.7%) and very often by 6(17.6%), while 3(8.8%) use it often and 7(20.6%) use it some of the times. The number of non-users is 13(38.2%) which is higher than those who use it often. Interactive lessons on CDROMS are employed by only 1(2.9%) who use them very often, 7(20.6%) often use them, while 8(23.5 %) do so some of the times. The use of Web 2.0 is worth mentioning here as it has a use weighting of 26 and it is used most often by 2(5.9%), 1(2.9%) use it very often while 3(8.8%) often use it, but 19(55.9%) do not use it at all. The other media shown in the table, such as the video transmission, video conferencing and Chat are poorly utilized. The Fax machine is used by 1(2.9%) very often or often and 4(11.8%) use it some of the times.

4.6.1 Summary of Regularity of Use of ICT

This section shows that the laptop is the most often used technological equipment. It is followed by the desktop computer, mobile technology and Microsoft Word which have a use weighting capacity of 90, 80 and 70 respectively. Course-related media and CDROMS have lower use weighing of 45 and 44 in terms of regularity of use, just like web 2.0 weighting of 26. Video conferencing, video transmission and Chat come dismally low with 12 points each just as the Fax machine is not used regularly. It accounts for only 9 use weighting points.

4.7 Objective Two: How ICT Devices are Used by Nurse Educators for Teaching and Learning

This section concentrates on how nurse educators use ICTs. This variable is split into six tables for ease of interpretation.

Table 4.8: How nurse educators use audio based technology for teaching and learning (N=34)

Audio-based	**Yes**	**No**
	F (%)	**F (%)**
Direct Classroom Teaching	17(50.0)	17(50.0)
Complementary Teaching	14(41.2)	20(58.8)
General Educational Programmes	12(35.3)	22(64.7)
Local and National Programmes	5(14.7)	29(85.3)

F=Frequencies; %=Percentages.

Table 4.8 shows how nurse educators use audio-based technology for teaching and learning in Edo State universities. The main activity audio-based technology is employed for is direct classroom teaching. Half of the respondents 17(50.0%) are found doing so. Fourteen

(41.2%) use it for complementary teaching, while 12(35.3%) use it for general educational programmes and the remaining 5(14.7%) use it for local and national programmes. The point to note here is that this media is employed by less than fifty percent (50%) of the lecturers in the various activities.

Table 4.9: How Audio-Visual Technology is Used for Teaching and Learning by Nurse Educators (N=34)

Audio-Visual	**Yes** **F (%)**	**No** **F (%)**
Direct Classroom Facilitation	22(64.7)	12(35.3)
Group Work & Assignment	19(55.9)	15(44.1)
Record and Store Presentation by Students	14(41.2)	20(58.8)
Record and Store Prepared Text for Classroom Facilitation	14(41.2)	20(58.8)
Community Health Posting	10(29.4)	24(70.6)
Excursion Class	6(17.6)	28(82.4)
Introductory Lectures	5(14.7)	29(85.3)
Disseminate Information	3(8.8)	31(91.2)

F= Frequencies; %= Percentages.

Table 4.9 shows that audiovisual devices is used by the majority of nurse educators 22(64.7%) for direct classroom facilitation while 19(55.9%) use it for group work and assignments. Recording and storage of students' presentations as well for as storage and preparations of texts for classroom facilitation account for 14(41.2%) users. It is used for community health posting by 10(29.4%) but only 3(8.8%) use it for dissemination of information.

Table 4.10: How Computers are Used for Teaching and Learning by Nurse Educators (N=34)

Computer	Yes F (%)	No F (%)
Prepare Lectures	29(85.3)	5(14.7)
Microsoft Word and Office Management	23(67.6)	11(32.4)
Spreadsheet for Students' Results	22(64.7)	12(35.3)
Search & Download Educational Materials	22(64.7)	12(35.3)
Send Educational Materials to Students	16(47.1)	18(52.9)
Install Presentation Software	14(41.2)	20(58.8)

F=Frequencies; %=Percentage

Table 4.10 shows how nurse educators in Edo State use computers for teaching and learning. The results indicate that 29(85.3%) use computers to prepare lectures while 23(67.6%) use it with Microsoft Office and Management. Twenty-two (64.7%) employ computers for both Spreadsheet for students' results and to search and download educational materials. Educational materials are sent to students with computers by 16(47.1%), while 14(41.2%) use it for installation of presentation software.

Table 4.11: How Nurse Educators Use Chat e.g. (Skype, MSN) and Course-Related Software for Teaching and Learning (N=34)

Chat (Skype) and Course-Related Software	Yes F (%)	No F (%)
Chat		
Access numerous web-based services	6(17.6)	28(82.4)
Skype to send instant audio-visual messages to students	4(11.8)	30(88.2)
Receive instant messages from students	4(11.8)	30(88.2)
Network globally with students	4(11.8)	30(88.2)
Course-Related Software		
Present course materials to students	18(52.9)	16(47.1)
To store course materials	15(44.1)	19(55.9)

F=Frequencies; %=Percentages

Table 4.11 shows how nurse educators in Edo State use Chat and course related software for teaching and learning. The figures depict a poor application of these forms of devices as only 6(17.6%) use Skype or MSN to access numerous web-based services. Four lecturers (11.4%) use this device to send instant audio-visual messages to students as well as receive instant messages from them. Global networking also accounts for 4(11.4%).

On the same table, the use of course-related software to present materials to students constitutes 18(52.9%) of those who use this media. It is also used by 15(44.1%) to store course materials, indicating a borderline application of the media by nurse educators.

Table 4.12: How Nurse Educators Use Email for Teaching and Learning (N=34)

Email	Yes F (%)	No F (%)
Send and receive messages from students	21(61.8)	13(38.2)
Schedule lectures	13(38.2)	21(61.8)
Receive assignment from students	13(38.2)	21(61.8)
Work and form communities	6(17.6)	28(82.4)

F=Frequencies; %=Percentages

Table 4.12 shows that the number of respondents who use email to send and receive messages from students is 21(61.8%). This, however, contrasts with only 13(38.2%) who schedule lectures and receive assignments from students respectively. Only 6(17.6%) of the respondents work and form communities with the email.

Table 4.13: How Nurse Educators Use Fax Machine and CD-ROMS for Teaching and Learning (N=34)

Fax Machine	**Yes** **F (%)**	**No** **F (%)**
Send documents to students	1(2.9)	33(97.1)
Receive documents from students	0(0.0)	34(100)
Send and receive documents from colleagues	4(11.8)	30(88.2)
Variable: CD-ROMS		
Direct classroom teaching	16(47.1)	18(52.9)
Store course materials	15(44.1)	19(55.9)
Rehearsal & revision sessions	6(17.6)	28(82.4)

F=Frequencies; %=Percentages

In Table 4.13, only one (2.9%) nurse educator makes use of the Fax machine to send documents to students while 4(11.8%) send and receive documents from colleagues through it. CD-ROMS are used for direct classroom teaching by 16(47.1%) of the respondents; 15(44.1%) use it to store course materials while 6(17.6%) employ it for rehearsal and revision sessions.

Table 4.14: How Nurse Educators Use Laptops for Teaching and Learning (N=34)

Laptop	Yes F (%)	No F (%)
Store information	30(88.2)	4(11.8)
Browse the internet	30(88.2)	4(11.8)
Prepare lectures	27(79.4)	7(20.6)
Students' presentation	20(58.8)	14(41.2
Facilitate lectures	19(55.9)	15(44.1)
Record classroom facilitation	19(55.9)	15(44.1)
Receive mail from students	18(52.9)	16(47.1)

F=Frequencies; %=Percentages

Table 4.14 represents how nurse educators in universities in Edo State use the laptop. Results depict a very favourable use of this device for teaching and learning. Thirty (88.2%) use the laptop to store information as well as browse the internet. It is used to prepare lectures by 27(79.4%) while the least use for which it is employed is for the receipt of mails from students. The responses, as shown on the table, are more than 50.00% of how nurse educators use the laptop.

Table 4.15: How Nurse Educators Use Mobile Technology Devices for Teaching and Learning (N=34)

Mobile technology devices	**Yes** **F (%)**	**No** **F (%)**
Send and receive message from students	25(73.5)	9(26.5)
Receive calls and messages from students	25(73.5)	9(26.5)
Urgent calls to schedule class	23(67.6)	11(32.4)
SMS to class leader	22(64.7)	12(35.3)
Connect with other faculty members	21(61.8)	13(38.2)
Record classroom facilitation & presentation	11(32.4)	23(67.6)

F=Frequencies; %=Percentages

Table 4.15 shows how nurse educators in Edo State use mobile technology devices for teaching and learning. Results indicate that the use of mobile technology devices, such as cell phones to send and receive messages from students accounts for its highest application 25(73.5%). The same number of respondents use it to receive calls and messages from students. Twenty-three (67.6%) employ it for urgent calls and also to schedule classes, while 21(61.8%) send SMS to class leaders with this media. Other uses are as shown in the table. It is important to note that this medium enjoys a high patronage by nurse educators except its use to record classroom facilitation which accounts for <33%.

Table 4.16: How Nurse Educators Use Video Transmission and Video Conferencing for Teaching and Learning (N=34)

Video Transmission and Video Conferencing	Yes F (%)	No F (%)
Video Transmission		
Receive recorded lectures from out-stations	7(20.6)	37(79.4)
Transmit recorded lectures to students	4(11.8)	30(88.2)
Video Conferencing		
Dialogue with nursing experts	6(17.6)	28(82.4)
Bring students from divers cultural background together	5(14.7)	29(85.3)
Dialogue with students across the globe	3(8.8)	31(91.2)

F=Frequencies; %=Percentages

Table 4.16 shows how nurse educators use video transmission and video conferencing for teaching and learning. The figures indicate that this medium is not commonly used by the lecturers. The highest is 6(20.6%) of respondents who use video transmission to receive lectures from outstations. Only 4(11.8%) use it to transmit recorded lectures to students. The same poor application is seen in video conferencing which attracts only 6(17.6%) lecturers using it to dialogue with nursing experts and 5(14.7%) to bring students from diverse cultural backgrounds together. Three (8.8%) use it to dialogue with students across the globe.

Table 4.17: How Nurse Educators Use Web 2.0 and Microsoft Word / Spreadsheet (N=34)

Web 2.0	**Yes** **F (%)**	**No** **F (%)**
Keep abreast with current trends in nursing	13(38.2)	21(61.8)
On-line journaling	8(23.5)	26(76.5)
Exchange views with students	7(20.6)	27(79.4)
Microsoft Word, Spreadsheet		
Prepare students' results	28(82.4)	6(17.6)
Office management	24(70.6)	10(29.4)

F=Frequencies; %=Percentages

Table 4.17 presents how nurse educators in Edo State use web 2.0 and Microsoft Office, Word and Spreadsheet for teaching and learning. Web 2.0 is used to keep educators abreast with current trends in nursing by 13 (38.2%); online journaling attracts 8(23.5%) while 7(20.6%) use it to exchange views with students. The users of this medium of communication are far below fifty percent (50%), which points at low application. The table, however, shows that Microsoft Office, Word and Spreadsheet attracts a high number of users. Twenty-eight (82.4%) use it to prepare students' results while 24(76.6%) find it useful for office management.

4.7.1 Summary of How ICTs are Used

This session analyzed how nurse educators use ICT devices for teaching and learning. The Findings reveal that the laptop, desktop computer, word processing and spreadsheet as well as e-mail constitutes the major devices (hard and software) used by nurse educators. These devices are used to send and receive messages from students, store information, browse the internet, for direct classroom teaching, to prepare lectures and to record classroom

facilitation. The email and cell phones are technologies that are commonly used to send and receive messages from students as well as to schedule lectures. These applications are quite high when compared to video transmission and video conferencing. The latter are used to send recorded lectures and for transmitting lectures from out-stations. Chats and facsimile are scantily used, while the CD ROMS are used for direct classroom teaching, for storing course materials and for rehearsal and revision.

4.8 Objective Three: Challenges about the Use of ICT

This section is about the challenges nurse educators face in their use of ICT devices. Table 4.18 shows some of the challenges that nurse educators in Edo State face in their use of ICTs in teaching and learning. The major challenge that was identified by them is erratic power supply 29(85.3%). Unstable connectivity accounts for 27(79.4%) while inadequate ICT facilities is experienced by 24(70.6%. The respondents who face challenges due to high cost of computers and its accessories are 19(55.9%). Lack of managerial or technical support accounts for challenges experienced by 18(52.9%). The others are as indicated in the table but it can be noted that each of these challenges affects more than 50% of the respondents, except for lack of skill 16(47.1%), and 12(35.3%) responses for out-dated facilities.

Table 4.18: Challenges Faced by Nurse Educators about the Use of ICT (N=34)

Variable	Yes F (%)	No F(%)
Erratic Power Supply	29(85.3)	5(14.7)
Unstable Connectivity	27(79.4)	7(20.6)
Inadequate ICT Facilities (Computer and its Accessories)	24(70.6)	10(29.4)
Lack of In-Service Training to Improve Skills	20(58.8)	14(41.2)
High Cost of Computers and its Accessories	19(55.9)	15(44.1)
Lack of Managerial or Technical Support	18(52.9)	16(47.1)
Exorbitant Charges for Airtime by Network Providers	17(50.0)	17(50.0)
Lack of Skill	16(47.1)	18(52.9)
Outdated and Old Facilities	12(35.3)	22(66.7)

F=Frequencies; %=Percentages

4.8.1 Summary of Challenges Faced by Nurse Educators in the Use of ICTs

The section analyzed the challenges faced by nurse educators in their use of ICTs. The findings revealed that the major challenge that was identified was that of erratic power supply, unstable connectivity, inadequate ICT facilities and lack of in-service training. However, lack of skill and out-dated facilities affect less than half of the respondents.

4.9 Objective Four: Suggestions

This section captures the solutions proffered by the nurse educators on how best to solve the challenges they encounter on the use of ICT. The major suggestions that appeared in the open-ended questions were organized into a *yes* and *no* type of questions that fell under the three major themes that appeared.

Table 4.19: Suggestions by Nurse Educators on How to Solve Identified Problems (N=34)

Variable	Yes F (%)	No F (%)
Improvement and Provision of ICT Facility & Connectivity	25(73.5)	9(26.5)
In-Service Training	24(70.6)	10(29.4)
Reduction of subscription fees and cost of soft ware	4(11.8)	30(88.2)

F=Frequencies; %=Percentages

Table 4.19 shows the solutions suggested by nurse educators to solve the problems they identified about the use of ICTs in universities in Edo State. Key among the solutions proffered is the improvement in existing facilities, provision of new ICT facilities and back-up services as well as improved connectivity by 25(73.5%). In-service training for lecturers is suggested by 24(70.6%) while only 4(11.8%) expressed concern about high subscription fees and cost of software.

4.10 Conclusion

This chapter presented the results of the study in the form of tables and graphs with a brief interpretation of the results accompanying each table. The first section described the response rate and the demographic details of the sample. The majority of the respondents were females 25(73.5%) with those aged between 50 and 59 years old constituting 20(95.2%). University A had the largest response rate (52.7%) among the three Universities, Lecturer I and II constitute the largest group of lecturers. Lecturers with master's degrees constitute the highest qualification of the respondents followed by those with PhD.

The second section presented the results of the types of ICT used by respondents for teaching and learning. Among the ICTs listed, all the respondents were found to use a laptop

34(100%); many use Word, Spreadsheet and Presentation software, followed by desktop computers. They all answered “no” to Electronic Whiteboard as a type of ICT device they use. A detailed breakdown of the cross-tabulation of computer use against the demographic variables was done to show the relationship between computer use and each variable because desktop computer use among the respondents constituted 32(94.1%). The respondents with the highest qualifications such as the masters 12(100%) and the PhDs 10(100%) were found to use computers more than the others. The third section presented the results of the regularity of the use of ICT. Computers are used more regularly than other ICTs, followed by laptops and Word and Presentation software.

The fourth section presented the results of how nurse educators use ICT. A detailed breakdown of how the educators actually use ICTs was further done in tables 10 to 19. This section has many respondents affirming that they use audio-based for direct classroom facilitation and audio-visual for group work and assignments by students. Use of desktop computers to prepare lectures comes tops followed by the laptop use to store information and browse the Internet. Most of the educators use Word, Spreadsheet and Presentation software to prepare students’ results.

The fifth session captured the challenges faced by respondents, where erratic power supply, unstable connectivity and inadequate ICT facilities were mentioned as the major challenges experienced. The final section of this chapter presented the results of the open-ended question in a “yes” or “no” format that addressed the respondents’ suggestions on how the problems about ICT use can be solved. Improvement in the provision of ICT facilities and network connectivity make up the main suggestions, while reduction in the cost of computers and accessories was mentioned by few respondents <12%.

CHAPTER FIVE

DISCUSSION OF THE RESULTS

5.1 Introduction

This chapter presents a discussion of the results that were presented in chapter four and how these findings are related to the literature. The first section presents the demographic data of the respondents and discusses the response rate, gender, age, institution, designation, number of years of practice and highest qualification. The second section relates to the types of ICTs used by nurse educators in Edo State universities; while the third section discusses regularity of use of ICT. The fourth section relates to how nurse educators use ICTs. The fifth section is about the solutions proffered by the respondents on how to solve the identified problems. The chapter is concluded with a summary.

5.2 Aim of the Study

The aim of this study is to explore and describe some of the major issues that pertain to nurse educators' use of ICTs in teaching and learning in nursing schools in Edo State, Nigeria with a view to proffering solutions to identified problems.

5.3 Demographics of Respondents

The response rate of 94.4% is considered very high as Fowler (1984**:**49) notes that a high response rate is invaluable when results are meant to be generalized to the larger population because the lower the response rate, the greater are the chances of bias. The positive response rate in this study can be attributed to the fact that the questionnaires were hand-delivered. This has implications for the response rate by respondents. Also of value was the co-operation and interest that was shown by the various heads of department in helping the researcher to sensitize and mobilize the lecturers in their departments by assigning a lecturer to the researcher to assist her in data collection.

The difference between the male and female gender groups was quite high in the universities, showing that the field of nursing is still female-dominated. This is in line with the history of the profession. Males are said to constitute less than 10% of all nurses in Western countries like Norway, and that has been the situation for some decades now (Booth, 2002**:**395; Solbrække, Solvoll, & Heggen, 2013**:**640). Their findings from the studies on how male students learn to practice nursing and the role of technology in their training process added to the study's understanding of gender and nursing education as well as deepening the understanding of how men can adjust to historically conceived notions of female professions like nursing. University A, which has the highest number of respondents, is dominated by female nurses. The only university where there was some kind of gender equity is University C.

It is worth mentioning that University A, which had the highest number of respondents, is a Federal government owned institution. It is in fact classified as a *first generation University* by the Ashby Commission set up by the British to study the needs of university education in Nigeria ("Nigerian Education Profile,"). Such organizations are fully funded by the federal government and therefore tend to attract more qualified lecturers to their fold. This was the position before the economic recession that is currently being experienced in the country (Nnadozie & Nnadozie, 2008**:**1). The other two are State and privately owned institutions respectively. In the first Distinguished Lecture series of Lead City University, Ibadan, Nigeria in 2006, the lecturer, Chief Afe Babalola, (OFR, SAN, LL.D), Pro-Chancellor and Chairman of Council, University of Lagos, made the following remarks concerning private universities in Nigeria….

> The advantages of private universities in our educational system are legion. Generally, they are well-funded and adequately maintained. The proprietors know that the best way to attract quality candidates is to ensure that they provide good services. It is common knowledge that private enterprises thrive better than public establishments.(Babalola, 2006)

The ages of the respondents fell between 20-60 years with a mean age of 53.03. There was only one respondent in the age range of 20-29years. The majority is in the range of 50-59years. This is a pointer that nurse educators tend to be those on the aging side of the profession. Nurses of the "baby-boom" era are beginning to retire. Also women now have greater career opportunities than it was in the distant past coupled with the perception of nursing as a trade instead of a career by many (Booth, 2002**:**392; Palmer, 2003**:**511). In addition, Booth (2002) notes that the average age of Registered Nurses (RNs) in the USA is 45 years while the average age of nurse educators in the universities' faculties who are teaching in the Bachelor's and higher degrees nursing programmes is 50.5 years. The increased age of faculty members can impact negatively on the future of the profession because the younger nurses are not taking up the nurse educators' role, thereby resulting in nurse educators shortage (Agbedia, 2012**:**228).

Lecturer I and II are more in number, followed by Assistant Lecturers. This could be due to the new appointments that are being made in these institutions, especially in University A. These positions are the lowest cadre in the academic rungs. It agrees with Eiriemiokhale's (2013**:**201) findings that Lecturers II constitute 72(23%) out of the 380 respondents in an investigation of the level of satisfaction with available electronic information resources in universities in Edo State. One should also mention here that there was only one professor in all the three Universities, which confirms the acute shortage of such qualified academic staff. It also agrees with Booth (2002**:**392) on the general problem of global nursing shortage. Closely tied to this variable is the number of the years of practice. The lecturers who have spent 0-4years and the ones above 20years in nursing practice constitute the majority. It can be inferred from this that new recruitment is on-going in these institutions, leaving the elderly staff members still very visible as mentioned earlier. Still on the demographics of the respondents, the highest qualification attained by most lecturers is the master degree and the PhD which indicates that the management of these Universities are

compliant with the minimum qualification of academic staff of nurse faculty at university level ("Nursing Degree Guide ").

Evidence from this study indicates that there is no significant relationship between gender, age, designation and highest qualification. However, the small nature of the sample population could be a major factor because previous studies by Lamanauskas et al. (2010**:**64) and Venkatesh et al. (2003) on ICT have found gender and age to correlate with ICT use.

5.4 Types of ICT Used by Nurse Educators

The first objective of this study was to identify and describe the types of ICTs nurse educators use in Edo State, Nigeria. According to the results of the study, all respondents in the three universities surveyed use ICTs for teaching and learning, though not all the types mentioned in the questionnaire are available and maximally used by all nurse educators. The ICT devices that are being used by the nurse educators as presented in order of choice shows that the laptop is the first technology of choice because all the respondents 34(100%) use it. This is followed by computers (desktop) 32(94.1%) and mobile technology 26(76.5%). Among the software, Word, Spreadsheet and Presentation software rank topmost 33(97.1%), followed by emails, audio-based and interactive lessons on CD-ROMS in that order. The inference drawn from this finding is that the lecturers are technology-compliant and they all have preferences for the laptop which is a mobile personal computer with all the features of a desktop computer. This aligns with Lamanauska et al's (2010**:**64) findings in Lithuania about the commonly used ICT by university students as well as Oshinaike and Adekunmi (2012**:**61) on computers and its accessories accounting for 95.0% and CD-ROMS 75.0% of multimedia tools that are used by university lecturers. Equally in support of this finding is that of Czerniewicz and Brown (2005**:**10) and Akbiyik and Seferoglu (2012**:**419) who report that apart from textbooks, teachers preferred websites, animation or videos with increased focus on the use of software such as the word processor, spreadsheets, presentation software and

web-editor page. However, it contradicts Cekerevac et al.'s (2011:264) investigation on the use of multimedia and multimedia presentations in an experimental survey among 200 students in a Serbian university which revealed that less than 30% of lecturers inadequately use multimedia tools in their lectures.

ICT media such as electronic whiteboard, video transmission and video conferencing are not being used at all, perhaps because they are not available in any of the universities' nursing departments though the researcher did not verify if it was available in the universities at large. This may be responsible for its low use or non-usage for teaching and learning. However, the respondents who claim they use it say they do so at personal arrangements level, that is, outside faculty arrangements. The concern here is that, the lecturers who do not use these forms of media are prone to using other media forms such as the conventional blackboard with its inherent disadvantages and pre-disposition to adverse respiratory conditions (Joshi & Morade, 2013:1).

Having identified the desktop computer as a technology of preference by the respondents, an analysis was drawn to find out if any relationship exists between computer use and the demographic variables. Results did not yield any significant association. However, the results of the cross-tabulations of these variables against the computer use show that all the males 9(100%) use computers as against 23(92.0%) females who also use it. Based on the fact that the females are more than the males irrespective of the percentage, it is difficult to conclude that the males are more ICT-compliant even though on face value this seems to be the case. Webster et al. (2003:140) also found that computer use is not influenced by gender while Venkatesh et al.'s (2003) UTAUT theory states that Effort Expectancy is influenced by gender, age and experience. It is said to be more salient for women than for men, something Lamanauskas et al.(2010:73) confirm. They assert that there is evidence of the presence of gender bias between science and humanities students and concluded that boys tend to use complicated functions of the computer more than girls. On the contrary in this

study, increased age was found not to affect computer usage among the respondents. All the age groups made use of computers with the highest being in the group of 50-59 and the lowest 20-29years. This apparently is good for nursing education as students who are technology savvy will find it worthwhile in the faculties as a near-equal match to meet their pace and needs.

When institutions were cross-tabulated against desktop computer use, University A had the highest use. As explained previously in this chapter, it is a Federal Government-owned institution which is supposed to be better equipped in terms of facilities and remuneration. Designation was found to be associated with computer use as Lecturer I and II and Assistant Lecturer are in the highest category of users. This has positive implications for the future of ICT use in the universities. Most of the younger nurse educators are traditionally in this category making it easier for them to embrace ICT use. It agrees with Eiriemiokhale (2013), that Lecturers II are the majority in universities in Edo State. Furthermore, number of years of practice is also not significantly associated with computer use, although educators who have spent 0-4yrs are more in number as far as computer use is concerned. This contradicts Webster et al.'s (2003**:**114) findings that computer use is influenced by level of education, nursing seniority, age, and length of time in the service and to a lesser extent, gender. When highest qualification was cross-tabulated against computer use, it revealed that more nurse educators with Masters in nursing and PhD degrees respectively use computers more than the other categories. This is good for the profession as it indicates that with time, faculties will realize the use of ICT for many other activities and purposes. However, the fact that out of the five respondents who possess the Bachelors' degree, 2(28.6%) do not use computers at all for teaching and learning is a pointer that perhaps the younger lecturers either do not take technology in nursing education seriously or they have not risen in the professional ladder to realize the indispensability of the computer and ICT in teaching and learning. This consideration informed the American Association of Colleges of Nursing to

recommend that competency in the use of technology and informatics on patient care should be made an essential component of doctoral education for advanced nursing practice ("National League for Nursing," 2008; Skiba et al., 2008**:**228)

In this study, computer (desktop) use is found to be influenced by highest educational level attained, thus agreeing with Webster et al.'s (2003**:**143) findings on Australian nurses and midwives' knowledge of computers and their attitudes to using them in their practice. In that study, computer use was influenced by education, nursing seniority, age, and to some extent gender.

5.5 Regularity of Use of ICT by Nurse Educators

In terms of regularity of use, all the nurse educators in this survey use the laptop more than other ICT devices with a use weight value of ninety (90) points. This leaves one with the impression that either all the lecturers own a laptop or have access to one in the course of performing their duties. This is followed by the desktop computer, mobile technology (cell phones and PDAs), Word and Spreadsheet as well as e-mail. The study also found that Web 2.0 is not employed very often by nurse educators (use weighting is 26). The same applies to use of Chat such as Skype and MSN whose platform is not used most often by any of the respondents. Interactive lessons on CD ROMS are used sometimes by 8(23.5%). But video transmission and video conferencing are poorly used platforms of communication because only 6(17.6%) use it sometimes with a weighting of 12 points. As at the time of this research, the electronic whiteboard has no place in any of the three institutions studied; but the Fax machine is used sometimes. This agrees with Oshinaike and Adekunmisi (2012**:**61) that computer use constitutes 76(95.00%) out of 80 respondents with 64(80.00%) users employing it most often, T.V 44(56.00%) but transparencies 4(5.00%) were seldom used.

5.6 How Nurse Educators Use ICT

The second objective of the study was to describe how nurse educators use ICT in nursing schools in Edo State, Nigeria. The study found that audio-based technologies such as radio and CD-ROM are used for direct classroom teaching by half of the respondents while fourteen (41.2%) use it for complementary teaching. Other area where audio-based technology is found useful is in local and national programmes which account for only 5(14.7%). This again aligns with Oshinaike and Adekunmisi (2012**:**61) who have observed that CD-ROMS make up 60(75%) of media resources. The inference drawn from this is that local and national programmes are capital-intensive, and also require the input from experts and university management. The potential cost and benefits have to be weighed against the target population. This sometimes results in time-wasting which may therefore make the educators to seek other means of communication (Selwyn, 2007**:**85).

The audio-visuals, such as TV, film and video are media of technology that are used by the majority of nurse educators for direct classroom facilitation and for group work and assignments. They are used by half of the respondents to record and store presentations by students and also store prepared texts for classroom facilitation respectively. From the diverse ways the medium is used by the respondents, the finding corroborates Rasul et al.'s (2011**:**80) opinion that "audio-visual helps to concretize knowledge that is to be presented, thereby making an experience unique, vital and real." Adamczyk et al. (2009**:**340) equally note that these classical media devices are invaluable during seminars and lectures. This therefore supports Oviawe and Oshio (2011**:**127) who opine that CD-MP3 and television are effective platforms to facilitate and improve teaching and learning. The same view is shared by Goyal et al. (2011**:**7) who remark that classical media serve as a strong tool for interaction between the instructor and students.

A point of concern here is the 20(58.8%) respondents who do not use audio-based devices for complementary teaching and their relative poor application in local and national programmes. This, therefore, disagrees with Oshinaike and Adekunmis's, (2012**:**69) findings that 44(55.00%) out of 80 respondents use the TV as a multimedia resource in university teaching. Unfortunately, audio visual are barely used for dissemination of information as in the case of audio based technology. Unless this has something to do with the communities in which technology is applied, it is not used at all. Thirty-one respondents, who represent 91.2%, answered in the negative to this item, showing that the communication system in most State and private universities needs some improvement. Hence Selwyn (2007**:**86) notes that business and industry interests go a long way in shaping governmental information technology policy. Application of technology in education is dependent on commercial interest of private investors who indirectly dictate the pace and application of these technologies. In Nigeria, the major telecommunication service providers are Mobile Telephone Network (MTN), Global Communication (GlobaCom), The Nigerian Telecommunications Network (NITEL) and AIRTEL (Dada, 2010).

Respondents who reported the use of computers to prepare lectures in Microsoft Office and management gave impressive reports. Other areas of computer use range from spread sheet for students' results to the search and download of materials from the Internet. It is equally for the installation of presentation software. These are similar to the findings by Oshinaike and Adekunmisi (2012**:**68) who identified that the computer and its accessories constitute 76(95.0%) of use among university lecturers. Another survey conducted by Webster et al. (2003**:**144) also reported an approximate figure of 75% of nurses who use a computer at home and 76% who felt confident enough to type their CV on a computer.

The use of Skype and MSN to access numerous web-based services or to send and receive instant audio-visual messages from students as well as network globally is not impressive. The percentage of users of this technology is still small when compared to computer use. The

respondents do not use these forms of media as much as their potential permits. This failure could result in low student/faculty communication. These forms of media, according to Gonzalez et al. (2003:57), can be used in establishing communication by lecturers with students and other professionals. It is a useful tool particularly to language teachers because it affords them with the opportunity to brainstorm with experts, study in small groups and also to get immediate feedback.

Closely related to Chat is course-related software that is used by more than half of the respondents to present materials to students and also to store course materials. The respondents to this question might have done so based on the fact that they have the knowledge of how the technology is used. This is due to the fact that e-learning mode of teaching is not yet established by the nursing departments of these universities. As Cohen (2002:12) notes, where the software is available, designated librarians monitor its usage. The email is being employed by nurse educators to send and receive messages from students as well as schedule lectures and receive assignments from students. The positive response by more than two third of the respondents to the use of this means of communication, agrees with Hassett, Spuches, and Webster (1995:221) and Adesanya, (2002) cited in Ogbomo and Ogbomo (2008:3) who note that emails are one of the most cost-effective means of communication that can be used across the whole world and within campuses for marketing goods and services. It also corroborates Olalokun (2008:282) who found that the email is used for communication, file or documents exchange, dissemination of results as well as data collection. The implications of only 6(17.6%) lecturers using email to form communities could have some far-reaching effects on the social interaction between faculties and students. These media can be strengthened to realize its full potential of use.

While it is clear that majority of the nurse educators are capable of using some forms of ICT for teaching and learning and for some other activities, only 1(2.9%) of the respondents reported using the Fax machine to send documents to students. Another

4(11.8%) report using it to send and receive documents from colleagues. The reason for this poor application can be attributed to the fact that the type of communication involving the use of Fax is most often channeled through the faculty administrative process. This limits nurse educators' use of this medium. The laptop recorded very high application for teaching and learning by more than 88.0% of the respondents. The high usage can be attributed to its mobility and other features which make it much more versatile than the desktop computer. This aligns with Eiriemokhale's (2013) findings that lecturers use information sources for research, to prepare lectures, send SMS and for subject-matter knowledge.

The study identified the application of mobile technology such as cell phones to be very high. More than 73.5% make use of it to send and receive messages from students as well as to receive calls and messages from students respectively. Short Message Service (SMS) to class leaders make up another important area of use. These devices, though personal possession by most lecturers, are used for teaching and learning in the form of instant messaging and voice calls to students. It guarantees immediate feed-back and instant communication with multiple individuals across the globe. It is not surprising that Instant Messaging (IM) is one of the largest growing Internet applications today, with an estimated 510 million users worldwide (Farmer, 2005**:**50). Similarly, Fernnadez et al.'s (2011**:**33) and George's et al. (2010**:**371) findings show that PDAs are used for both classroom and clinical activities and as drug reference software applications. It serves more or less like a tool box to science students. Actually, PDA use by the respondents in this study was not impressive. Only 11(32.2%) of the respondents use PDAs. Despite its handiness, many educators do not use it for recording of classroom presentation, implying that not all of them possess the tool.

Video transmission and video conferencing are also poorly used by the respondents to receive lectures from out-stations. These forms of media are actually not on ground in the various nursing departments at the moment. This has many implications for nursing education as the gains of these media of learning are seriously hampered. It agrees with

Olalokun (2007**:**21) whose findings regarding availability, accessibility and use of ICTs by Nigerian women academics found that only 14(6.8%) and 24(11.7%) out of the 205 respondents have teleconferencing and video conferencing facilities in their institutions.

Web 2.0 is used to keep abreast with current nursing trends, online journaling and to exchange views with students. The study shows that nurse educators actually make use of the social media as espoused by Hansen and Erdly (2009**:**2) who remarked that these technologies are useful in cyber learning with videos, advanced video conferencing, collaboration and networking with peers and faculty. It also agrees with Barry and Hardiker (2012) who reveal that the number of nurses and midwives on the social media such as Facebook in the United Kingdom is close to 355,000, thus predicting to rise to several millions world-wide in the near future (NMC, 2011).

The number of users of Web 2.0 in this study is low. This may be connected to the age of the respondents. Those between the ages of 50-59 make up 61.0% of the faculty in these universities. This agrees with the UTAUT Model of Venkatesh et al. (2003) which states that "increased age has been shown to be associated with difficulty in processing complex stimuli and allocating attention to information on the job." On the other hand, Microsoft Office, Word and Spreadsheet are very much common applications in teaching and learning. Twenty-eight (82.4%) of the respondents use it for preparation of students' results. It is equally used extensively in office management. This implies that nurse educators use the features of this technology. These include spelling and grammar check, word count and other features found in the newer version that permits the user to speak to it or tell it what to do.

5.7 Challenges

The third objective of the study is to identify the challenges faced by nurse educators in Edo State about the use of ICTs. The major hindrance faced by the lecturers is erratic power supply and unstable connectivity. This is followed by inadequate ICT facilities, lack of

in-service training and high cost of computers. The researcher personally experienced some of these challenges in the course of carrying out this study. Power supply and Internet connectivity was at its lowest and many lecturers could only access the internet through a modem at their own cost. Though all the universities are connected to the national electric grid and own generators that augment the power supply to avoid total shut down of activities, the problem seem not to be abatable.

One interesting point to note is that only 12(35.3%) of the respondents view out-dated and old facilities as a challenge. This could be attributable to the fact that the country only recently made a pronouncement on ICT for nation building and development (FGN, 2001). The infrastructure that is currently on the ground for this purpose is being improved and cannot be seen to be out-dated and old in this short space of time. Technology evolves on a daily basis. However, these challenges agrees with Skiba et al (2008:228), Anekwe and Ifeakor (2011:508) and Chapatula (2012:38) who identified cost and lack of steady electricity supply as some of the challenges faced by educators in Nigeria and Malawi respectively. They however stress that obsolete technology, lack of infrastructure, instructional design and training are major factors which can frustrate the adoption of new technologies in these countries. In contrast to these findings, Aguele (2007:177), Goyal et. al (2011) and Eseza et al. (2010) identify policy and planning, staff resistance to changed curricula and pedagogical approaches. Also of note is the complaint of teaching staff regarding lack of incentives and rewards which makes them reluctant to accept implementation of ICT in teaching and learning.

These challenges are in line with the Federal Republic of Nigeria's pronouncement in 2001. Reliable infrastructure, skilled human resources, open government and other essential issues of capacity building are challenges that are to be addressed in order to reap the full gains of this new technology (FGN, 2001).

5.8 Suggestions

This section discusses the fourth objective of the study, which addresses the solutions to the problems of ICT for teaching and learning identified by the nurse educators in Edo State. The suggestions by respondents comprise improvement in the provision of ICT facilities and connectivity as well as in-service training for lecturers. One interesting observation in this study is that only 4(11.8%) respondents have recommended the reduction of subscription fees paid to net-work providers. These suggestions agree with Eiriemiokhale (2013) who suggested that university lecturers should, among other things that will enhance academics' skills in the current dispensation, train and retrain themselves in electronic technology use; while university management should have the will-power to provide data bases and Internet facilities at no cost to the academic staff. Qualified IT experts should be employed to solve ICT problems of hardware and networking as necessary.

5.9 Recommendations

5.9.1 Future Research Projects

After a critical analysis of the study, more research regarding this topic is needed because there is very little literature on nurse educators' use of ICT in teaching and learning in Nigeria, particularly Edo State. ICT have not taken root in nursing departments in Edo State universities although the nurse educators realize the importance. Therefore, further studies can be carried out to actually explore what nurse educators' perceptions and attitudes are towards the use of ICTs in the training of today's nurses for the future.

5.9.2 Recommendations Specific to the Study

The use of technology in all facets of life is now considered the norm throughout the world and not just a requirement, especially in education. Its advantages are quite enormous and cannot be over-emphasized. It is imperative that university management work towards the provision of the enabling environment for this to occur. Based on the findings and

suggestions by the respondents on the possible ways to mediate the challenges encountered by them in the use of ICTs, the following recommendations are made:

1. Erratic power was identified in this study to constitute a major hindrance to ICT use. Since the problem of power supply has become a national issue, the university management should go the extra mile to purchase new generators that have the capacity to serve the whole university community. Regular maintenance of the electricity generating plants should be carried out to avoid frequent shut-downs of power supply or power rationing. The current power generating efforts can be enhanced by exploring the solar energy alternative.
2. Provision of ICT facilities especially desktop computers as part of office equipment for all the nurse educators should be considered a basic requirement. The study has revealed that there were respondents who identified inadequate ICT facilities such as desktop computers and their accessories to be a major hindrance to ICT use. All lecture halls should be installed with requisite facilities for easier service to teaching and learning.
3. University management should increase the bandwidth they currently have to make Internet facilities and e-library functional and accessible to both staff and students all the time. This is based on the identified problem that is experienced by the lecturers regarding connectivity. In addition, internet connection in the offices of the lecturers should be considered as another basic need that can help to mediate the unstable connectivity problems identified as a challenge in this study and the linkage programmes with students.
4. There should be regular up-date courses and training for all lecturers on how to use ICT for teaching and learning. The new employees as well as the older staff members should be involved because the study identified lack of in-service training as a major challenge. This can be achieved through private partnership with network providers like MTN,

GLOBACOM, NITEL and AIRTEL to provide and equip not only the main libraries of the universities with the necessary hardware and software. The same should be extended to all departmental libraries. In-house training workshops on ICT use for teaching and learning could be arranged for nurse educators by the university IT departments.

5. ICT technicians and experts should be employed and be readily available at the universities. This will make it easy for staff to access ICT services. A help desk where lecturers can get ready assistance on any technical or personal issues regarding technology application is recommended.
6. The government of Nigeria is urged to take a critical look at the current charges for subscription to network providers. The study found charges by these providers to be exorbitant. The same thing goes with the cost of ICT devices. The various regulatory bodies should be empowered to carry out spontaneous checks and balances to reduce exploitation and ripping off of clients by businessmen.

5.9.3 Limitations of the Study

The study used a quantitative method that involved the use of a questionnaire to elicit the participants' responses on the types of ICTs they use and how to solve identified challenges encountered as possible solutions. Due to the small nature of the population sample of the study it was practically impossible to cross-tabulate the findings and make inferences. Therefore, future research could be carried out which should involve all the nursing institutions in the state and not limit it to university-based education. Mixed methods and approaches which entail a qualitative method (focus group discussion & classroom observations) as well as quantitative methods are recommended for future research to actually explore how the nurse educators make use of these technologies and verify the technologies

available through an application checklist. This is to avoid the pitfalls of quantitative study such as giving socially acceptable answers which cannot be ruled out from this study.

5.9.4 Conclusion

This study has shown that nurse educators in Edo State, Nigeria are ICT compliant as far as teaching and learning is concerned. The most common and frequently used ICTs are the laptop, desktop computer, mobile technologies (Cell phones) and Microsoft Word & Spreadsheets. The email is used by more than half of the lecturers for teaching and learning. The other technologies like video conferencing and video transmission as well as chat are not adequately used because these services are not fully activated in the nursing departments. Although the nurses have some knowledge on how to use technology in their teaching, they are hindered by a lot of factors. Chief among them are unreliable power supply, unstable connectivity, inadequate ICT facilities, lack of in-service training and high cost of computers. Therefore, it is important that all these issues be holistically approached. All the nursing departments should have ICT facilities and equipment installed to ease the problems of the lecturers. The young and newly employed as well as the older ones are urged to continually up-date themselves. If this is done comprehensively, there is a better chance that Nigeria will produce better nurses that will compete effectively with others in the global community.

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APPENDIX A

UNIVERSITY of the WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

18 June 2013

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Mrs R Esewe (School of Nursing)

Research Project:	The use of information and communication technologies by nurse educators for teaching and learning in Edo State, Nigeria.
Registration no:	13/5/11

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

The Committee must be informed of any serious adverse event and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Private Bag X17, Bellville 7535, South Africa
T: +27 21 959 2988/2948 . F: +27 21 959 3170
E: pjosias@uwc.ac.za
www.uwc.ac.za

APPENDIX B

ETHICS AND RESEARCH COMMITTEE
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF BENIN
BENIN CITY

ETHICAL APPROVAL CERTIFICATE

FROM: The Chairman, Research and Ethics Committee
College of Medical Sciences

Ref: CMS/PO/109/Vol.I/106

TO: Mrs Roselynd Esewe
Department of Nursing Science

Date: 1st July, 2013

TITLE OF PROJECT: The Use of Information and Communication Technologies by Nursing Educators for Teaching and Learning in Edo State.

Your research protocol sent to this committee has been reviewed. The committee's decision is stated below. If you have amendments to make, please do so within 2 weeks of the receipt of this document to allow for expedite action on your protocol.

DECISION OF THE COMMITTEE

APPROVED: YES

RECOMMENDATIONS

The Committee has directed that you proceed with this research and should be completed within the shortest possible time.

Thank you.

Professor (Mrs.) E.I. Unuigbe
Chairman, Ethics and Research Committee.

Pst. M.I. Owie
Secretary, E&RC.

APPENDIX C

AMBROSE ALLI UNIVERSITY

P.M.B. 14, Ekpoma, Edo State, Nigeria

VISION: *To foster the growth of knowledge for the advancement of society.*

Office of the Registrar

Acting Registrar:
F. A. OJO-MALIKI, MNIM, MANUPA
B.Sc. (Hons.), MPA (Ife)

GSM NO: 08036041327
Cable & Telegram: ALLI VERSITY
E-mail: registrar@aauekpoma.edu.ng

Our Ref: AAU/REG/ISS.646/VOL.XVI/267

Date: 4th July, 2013

Mrs. Roselynd Esewe,
Nursing Science Department,
School of Basic Medical Sciences,
University of Benin,
Benin City.

RE: APPROVAL TO CONDUCT RESEARCH IN THE DEPARTMENT OF NURSING, AMBROSE ALLI UNIVERSITY, EKPOMA

Your letter on the above subject refers.

I write to inform you that approval has been given for you to conduct your M.Sc. Nursing Research study at Ambrose Alli University, Ekpoma.

By a copy of this letter, the Head, Department of Nursing is hereby informed of the above and advised to give the necessary support you need to ensure a successful research.

Thank you.

F.A. Ojo-Maliki, MNIM, MANUPA
Acting Registrar

AMBROSE ALLI UNIVERSITY
- 4 JUL 2013
Registrar's Office
EKPOMA

APPENDIX D

IGBINEDION UNIVERSITY, OKADA

OFFICE OF THE REGISTRAR

IUO/REG/SM/SGM/37 2nd July, 2013

Office of the Dean,
Department of Research Development,
University of the Western Cape,
PMB X17,
Ballville 7535,
South Africa.

Attention: Ms Patricia Josias

Dear Sir/Madam, Josias Research Ethics Committee Officer

RE: APPROVAL TO CONDUCT RESEARCH IN THE DEPARTMENT OF NURSING; IGBINEDION UNIVERSITY, OKADA: MRS R. ESEWE M.SC. STUDENT OF YOUR UNIVERSITY

I write to inform you that approval has been granted to Mrs. Roselynd ESEWE to conduct her M.Sc Nursing Research study at Igbinedion University, Okada.

I want to assure that Mrs. Esewe will be given all the support she needs for a successful research study.

Thank you.

E.O. Okoro
Registrar

E. O. OKORO, *BA (Hons), M.I.L.R. (Ibadan), MNIM*
REGISTRAR/SECRETARY TO COUNCIL
Tel:234- (0)803-395-8334
e-mail: ediokoro@yahoo.com

P.M.B 001 OKADA, EDO STATE, NIGERIA
www.iuokada.edu.ng

PROF. EGHOSA E. OSAGHAE, *Ph. D., JP*
VICE-CHANCELLOR

APPENDIX E: Information Sheet

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: 021-9592271 Fax: 9592679

E-mail:rossysewe@yahoo.com

INFORMATION SHEET

Project Title: The Use of Information and Communication Technologies by Nurse Educators for Teaching and Learning in Edo State, Nigeria

What is this study about?

My name is RoselyndEsewe. I am currently registered for a Master programme in nursing education at the University of the Western Cape, and I am doing my research under the supervision of Prof. O. Adejumo. I invite all the nurse educators at the University A, Benin-City, University B, Ekpoma and Igbinedion University, Okada, to participate in the research study specified above. The purpose of this study is to explore the use of Information and Communication Technologies by nurse educators for teaching and learning in Edo State, Nigeria.

What will I be asked to do if I agree to participate?

If you agree to participate in the study, you will be requested to complete the handed out questionnaire that will take 30minutes to complete at your own time in the office or at home and you have it returned in a closed envelope that will be provided. Then, the researcher will collect the completed questionnaires and place them in a secure place under lock and key for five years after the results have been published. Only the researcher, the supervisor and the statistician will have access to the data collected.

Would my participation in this study be kept confidential?

All the personal information and responses in the questionnaire will be kept in a secure place for five years after the results of the research have been published. The questionnaires will remain anonymously numbered to prevent linking the responses with your personal identification. In order to maintain confidentiality, the researcher will not mention your names or the name of the institution in the publication of the research findings.

What are the risks of this research?

There are no known or anticipated risks associated with participating in this research project, if however you feel uncomfortable, before, during or after the participation, you are free to withdraw your participation by notifying the researcher, and this decision will be respected, without any form of repercussion to you.

What are the benefits of this research?

The results will not benefit you directly, but the findings will be beneficial to you as a nurse educator because it may help to develop an adequate teaching/learning environment and capacity building for use of technology if required.

Am I obliged to take part in this research project and can I stop participating at any time?

Your participation in this study is voluntary and you are free to withdraw at any stage of the study without penalty or compromising your status as a nurse educator. You may decide not to participate in the study at all with no repercussion.

How do I get my questions answered?

You are free to ask any question pertaining to the study or your participation. The following are my contact details.

Roselynd E. Esewe
Nursing Science Department,
School of Basic Medical Sciences,
University A, Benin City,
Edo State, Nigeria.
Cell Phone: 08023368031; +27738027593
Email: rossysewe@yahoo.com

You have rights as participants to ask any question related to the study or report any problem encountered during the study. Therefore, should you have any question or problems that needs to be addressed, do not hesitate to contact the following;

Prof. O. Adejumo
My Supervisor & Head of CENTELS
School of Nursing, University of the Western Cape
Private Bag X17, Belville 7535
Cape Town. Republic of South Africa.

Telephone: +2721 9593024 (0); +27824436131
Fax: +27865108808
Email: oadejumo@uwc.ac.za

Dean of the Faculty of Community and Health Sciences

Prof Jose Frantz
University of the Western Cape
Private Bag X17
Bellville 7535
Phone: 021 9592631 Email: jfrantz@uwc.ac.za

This research has been approved by the Senate Research Committee and Ethics Committee of the University of the Western Cape.

APPENDIX F: Written Informed Consent Survey

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: 021-9592271 Fax: 9592679
E-mail:rossysewe@yahoo.com

INFORMED CONSENT FORM

Title of Research Project: The Use of Information and Communication Technologies by Nurse Educators for Teaching and Learning in Edo State, Nigeria

I confirm that I have read and understood the information on the above study and the given description of the study is in the language that I easily understand. I had the opportunity to ask questions related to the study. I therefore, decide to take part in the study and understand that my participation is voluntary and confidentiality will be maintained. I am free to withdraw at any time from the study without any penalty or effect on my job.

Participant's name……

Participant's signature…….

Witness……..

Date……...

Should you have any further questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:
Study Coordinator's Name: Prof OluyinkaAdejumo
School of Nursing, University of the Western Cape
Private Bag X17, Belville 7535
Cape Town. Republic of South Africa.
Telephone: +2721 9593024 (0); +27824436131; Fax: +27865108808; Email: oadejumo@uwc.ac.za

APPENDIX G: QUESTIONNAIRE TO THE LECTURERS

UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa
Tel: 021-9592271 Fax: 9592679

E-mail:rossysewe@yahoo.com

Title of Research Project: The *Use of Information and CommunicationTechnologies by Nurse Educators for Teaching and Learning in Edo State, Nigeria*

Instructions: Please mark X in the response column to indicate your answer

SECTION A*:* *This section is meant to collect your demographic information for statistical purposes only, and will not be used in any way to identify you as a participant.*

1. *Please indicate your Gender*

Male	
Female	

2. Kindly indicate your *Age*

20-29years	
30-39years	
40-49years	
50-59years	
60yrs and above	

3. Please indicate the *Name of your institution:*

University A	
University B	
Igbinedion University	

4. What is your current position or *Designation*

Professor	
Associate Professor	
Senior Lecturer	

Lecturer 1 & 2	
Assistant Lecturer	

5. How many years have you practiced as *a nurse educator?*

Above 20yrs	
15-20yrs	
10-14yrs	
5-9yrs	
0-4yrs	

6. What is your *highest qualification?*

1	Bachelor of Nursing	
2	Post graduate Diploma in N.Ed	
3	Masters in Nursing	
4	PhD	
5	Other (Specify)	

SECTION B: *This section is about the types of ICTs you use for teaching and learning.*

Put X in the space provided for any of the listed technologies. You may mark more than one, or as many as describe the ones you use.

1. Which of the following types of ICTs do you use for your teaching and learning**?**

		Yes	No
1	Audio based e.g. C.Ds, Cassettes, radio.		
2	Audio-visual e.g. Films, TV, Video		
3	Computers		
4	Chat (Yahoo MSN e.g. Skype)		
5	Course related soft ware		
6	Electronic white board		
7	e-mail		
8	Fax machine		
9	Interactive lessons on CD-ROMS		
10	Laptop		
11	Mobile technology e.g. Cell phones, Personal Digital Assistant (PDA)		
12	Video transmission		
13	Video conferencing		
14	Web 2.0 social networking (Face book, Twitter, Blogger, Linkedin, Boxbe, etc)		
15	Word, spread sheet and presentation soft ware		
16	Other (Specify)		

2. How often do you use the following ICT?

(4=Most often, 3=Very often, 2=often, 1=Sometimes, 0=Not at all)

S/N	Type of ICT	4	3	2	1	0
1	Audio based e.g. C.Ds, Cassettes, radio.					
2	Audio-visual e.g. Films, TV, Video					
3	Computers					
4	Chat (Yahoo MSN e.g. Skype)					
5	Course related soft ware					
6	Electronic white board					
7	e-mail					
8	Fax machine					
9	Interactive lessons on CD-ROMS					
10	Laptop					
11	Mobile technology e.g. Cell phones, Personal Digital Assistants (PDA)					
12	Video transmission					
13	Video conferencing					
14	Web 2.0 (Face book, Twitter, Blogger, Linkedin, Boxbe, etc)					
15	Word, spread sheet and presentation soft ware					
16	Other (Specify)					

SECTION C: *The following section attempts to find out how you use ICT.*

3. Please put X for the statement that best describes how you use the following ICT.

1	**Audio based e.g. C.Ds, Cassettes, radio.**	**Yes**	**No**
	Direct classroom teaching		
	Complimentary teaching of courses in the sciences and health education		
	General educational programmes		
	Local and national programmes		
	Other (specify)		
2	**Audio-visual e.g. Films, TV, Video**		
	Direct classroom facilitation		
	Record and store presentation by students		
	Record and store prepared text for class room facilitation		
	Disseminate information to the students in form of announcement (TV)		
	Excursion class		
	Introductory lectures only		
	Group work and assignments		
	Community Health postings		
	Other (Specify)		
3	**COMPUTERS**		
	Preparation of lectures		
	Microsoft word and office management		
	Spreadsheet for students' results		
	Installation of presentation soft ware		
	Search and download course materials		
	Send materials to students		
	Receive students assignments		
	Other (Specify)		

4	**CHAT (YAHOO MSN e.g. SKYPE)**		
	Instant audio-visual messages to students		
	Instant audio-visual messages from students		
	Net work with students and colleagues globally		
	Access numerous web based services		
	Other (Specify)		
5	**COURSE RELATED SOFT WARE**		
	Presentation of course materials to students		
	Storage of course materials		
	Other (Specify)		
6.	**ELECTRONIC WHITE BOARD**		
	Display information to students in same class		
	Display information to students in multiple location taking the same course on campus		
	Teleconferencing		
	Other (Specify)		
7	**E-MAIL**		
	Send and receive messages from students		
	Schedule lectures		
	Send course materials to students		
	Network and form communities as in (Twitter, face book, blogging)		
	Assignment submission by students		
	Other (Specify)		
8	**FAX MACHINE**		
	Send documents to students		
	Receive documents from students		
	Send and receive documents to/ from colleagues		
	Other (Specify)		
9	**INTERACTIVE LESSONS ON CD-ROMS**		
	Direct classroom teaching		
	Storage of course materials		
	Rehearsal and revision of tape recorded sessions		
	Other (Specify)		
10	**LAPTOP**		
	Store information		
	Browse the internet		
	Send and receive mail from students		
	Facilitate lectures		
	Prepare lectures		
	Presentation by students		
	Record class room facilitation and presentation		
	Other (Specify)		
11	**MOBILE TECHNOLOGY E.G CELL PHONES, PERSONAL HAND HELD COMPUTER(PDA)**		
	Send and receive message from students		
	Receive calls and messages from students		
	Urgent calls e.g. to reschedule class time, date and venue		
	SMS (Short Message Service) to class leaders		
	Connect with other faculty members		

	Record class room facilitation and presentation		
	Other (Specify)		
12	**VIDEO TRANSMISSION**		
	Transmit recorded lectures to students		
	Receive recorded lectures from outstations		
	Other (Specify)		
13	**VIDEO CONFERENCING**		
	Dialogue with students from across the globe		
	Bring students from divers cultural background to learn together		
	Dialogue with nursing experts		
	Other (Specify)		
14	**WEB2.0(Facebook, twitter,blogger)**		
	Exchange views with students		
	On-line Journaling (Blogging)		
	Keep abreast with current trends in nursing		
	Other (Specify)		
15	**WORD, SPREADSHEET AND PRESENTATION SOFTWARE (e.g Power Point)**		
	Microsoft word and office management		
	Preparation of students results		
	Class room facilitation of lectures		
	Presentation at Workshops &Conferences		
16	Other (Specify)		

SECTION D: *This section is about the challenges you face using ICT.*

4. Which of the following describes the challenges you face in the use of ICT?

		Yes	No
1	Inadequate ICT facilities (computers and its accessories, projectors, air conditioners, buildings, etc)		
2	Available facilities are outdated and too old.		
3	Lack of Skill		
4	Lack of Technical or managerial support		
5	Erratic electricity supply		
6	Exorbitant charges for air time by network providers		
7	Unstable connectivity		
8	Lack of in-service training to improve skills		
9	High cost of computers and its accessories		
10	Other (specify)		

5. What suggestions do you have to improve faculty development with regard to information and communication technology at your university? You are not limited in what you may write, and may use additional space or page if necessary.

1…….

2…….

3…….

Thank you again for participating in the survey