ASSESSMENT OF THE USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) IN TERTIARY INSTITUTIONS IN KATSINA STATE, NIGERIA

BY

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Declaration

I declare that the work in this Thesis entitled 'Assessment of the Use of Information and Communications Technology in Tertiary Institutions in Katsina State, Nigeria' has been performed by me in the Department of Education Foundation and Curriculum Studies, under the supervision of Prof. A. T. Kadage and Dr S. A. Zubairu.

The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this thesis was previously presented for another degree or diploma at this or any other institution.

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Certification

This Thesis entitled ‘‘ASSESSMENT OF THE USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY IN TERTIARY INSTITUTIONS IN KATSINA STATE, NIGERIA,’’ by Umar Muhammad AHMAD meets the regulations governing the award of Masters Degree of Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Dedication

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Abstract

This research work is on the 'Assessment of the Use of Information and Communications Technology in Tertiary Institutions in Katsina State, Nigeria'. The sample institutions were UMYU and IKCOE out of the four tertiary institutions under the control of Katsina State Government viz Umar Musa Yar'adua University, Isa Kaita College of Education, Hassan Usman Katsina Polytechnic and Yusuf Bala Usman Legal and General Studies. The study adopted descriptive survey research design. The population of the sample institutions (UMYU and IKCOE) were 663 lecturers (UMYU 452 and IKCOE 211 lecturers) and 10,866 students (UMYU 5799 and IKCOE 5067 students). The sample was calculated as 350 lecturers (UMYU 210 and IKCOE 140 lecturers) and 722 students (UMYU 361 and IKCOE 361 students). The data collection procedure was through the use of questionnaire titled 'Assessment of the Use of Information and Communication Technology in tertiary Institutions in Katsina State'. The instrument was administered as part of the analysis procedure which took place within a period of two weeks, in December, 2013 and analyses were completed using simple percentage. The findings of the study clearly revealed that the types of ICT resources provided in tertiary institutions in Katsina State were inadequate. It is recommended that ICT resources and facilities be provided to tertiary institutions in the State: Lecturers should endeavour to acquire some of these tools, since they are integral part of the instructions, government and non-governmental organisations should put more emphasis on campaigns in order to create awareness on the positive role of ICT in today's modern society.

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Abbreviations

ET:	Educational Technology
FCEKAT:	Federal College of Education Katsina
FUDMA:	Federal University Dutsin-ma
HUK-POLY:	Hassan Usman Katsina Polytechnic
ICT:	Information and Communications Technology
IKCOE:	Isa Kaita College of Education
IPM	Information Processing Machine
IT:	Instructional Technology
ITF:	Industrial Training Fund
JSS:	Junior Secondary School
KATU	Katsina University Katsina
NCET:	National Council of Educational Technology
SBRS:	School of Basic and Remedial Studies
SCET:	Scottish Council for Educational Technology
SIWES:	Students' Industrial Work Experience Scheme
SSS:	Senior Secondary School
UMYU:	Umar Musa Yar'adua University
YBU- CLGS:	Yusuf Bala Usman College of Legal and General Studies

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The use of ICT could be an effective tool in attaining any goal set by Tertiary Institutions, the Society and the Government. Many investigations and researches have revealed that ICT is an important fulcrum on which modern society revolves around. This mean it is an effective instrument in bringing change which could lead to faster advancement in every sector of human life, most especially if effectively and efficiently managed. Historically, when modern technology emerges first in other parts of the world including Africa and precisely Nigeria, traditional systems of instruction was common before the recent replacement with a new one that is ICT-based, some of the changes introduced were partly adopted while some were wholly adopted in schools, most especially in the developing countries, Nigeria inclusive. These adoptions or uses were visible in almost all levels of education system- pre-primary, primary, secondary, and Tertiary Institutions.

Institutional activities like record keeping, admission processing, students registration, teaching, learning, practical demonstrations, , assessments and so on could be achieved via the use of ICT. Therefore in trying to put into our knowledge how system of Nigeria's education looks like, it is classified into different levels mainly four or five viz pre-primary, primary, secondary (JSS and SSS) and tertiary levels (Adeyemi and Olaleye, 2010). In short, the system is designed as 6-3-3-4 system before it was recently changed to 1-6-3-3-4 system which made it five levels. In recent periods, the traditional methods were commonly employed such as chalkboard, human talks and poor quality print materials. But as time progresses, modern man understood the need to simplify and improve his life, these resulted in the design and implementation of the use

of variety of machines that formed the basis of new process for passing information, of communications, of management and administration in education and in other areas as well. These led to the use of Information and Communications Technology (ICT) resources in tertiary institutions.

What is ICT? ICT refers to so many things but for the sake of simplicity and clarity in this research work, it refers to the integration of computing technology and information. Also, Mohanty and Vohra (2008) added broadly that ICT could also be defined as ‘‘anything which allows us to get information, to communicate with each other, or to have an effect on the environment using electronic or digital equipment.’’ In the views of Asiabaka and Oku (n.d), the heart of the ICT revolution are the computers because they are fast information processing machines (IPM), configured to receive input in the form of information, systematically process the input and provide organized information that serves the needs of the user.

The early computers were designed to aid computation, however, today, their use has become diverse and computation is just one among the many functions of the computer. Adeyemi and Olaleye (2010), emphasised that the use of ICT can improve education quality, expand learning opportunities and make education accessible. If education is made accessible to all, people who lived both in the rural and urban areas, learners with special needs and others would benefit more with less difficulty.

It is due to the above and other advantages of use of ICT that the Nigerian Educational reforms stressed the importance of use of computer technology in schools during the 32nd Ministerial Council meeting of the National Council on Education in 1987, (Adeyemi and Olaleye, 2010). Emphatically, the National Policy on Education (FRN) as revised in 1988 and 2004, re – emphasized the need for the integration of this ICT education in the Nigerian educational system. This is an acceptance of the need to

go beyond computer to the level of ICT which also call the need for infrastructure, (Agbetuyi and Oluwatayo, 2012). It is the hope of this research to identify whether these ICT resources are provided in Katsina State Tertiary Institutions or otherwise.

In analysing the policy of Nigeria's education system, Zubairu (2013) noted that the policy (National Policy on Education) was inadequate for positive impact on the Nigerian education system. This, he noted, stems from the fact that the philosophical frame of reference is market driven, and that there is little emphasis on the integration of ICT in instruction. It should be noted that none of the policy documents, National Policy on Computer Education, neither National Policy on Education nor Nigerian National Policy on Information Technology recognised the need to use the computer or ICT to provide access to education for people with disability. This underscores a major inadequacy in the policy document, (Zubairu, 2013). In addition the strategies outlined in the document were not followed. These might have made still difficult to marry out this new development in to our tertiary institutions.

In stressing term, the importance of ICT is quite enormous from the general educational perspective. According to Achimugu, Oluwagbemi and Oluwaranti (2010), higher education is approaching the point at which science and technology particularly ICT, plays a vital role in nearly all phases of the educational process. The Internet has emerged as a major driving force of this dynamic development of ICTs which has impacted positively in virtually every sector of the Nigerian economy. In the education sector, Tertiary Institutions use computers in their academic programs in order to produce good quality of research output and learning.

Though the chalkboard, textbooks, radio/television and film have been used for educational purposes over the years, none has quite impacted on the educational process like the computer.Other means of Information Communications Technologies according

to Adeyemi and Olaleye (2010), apart from computers are internet services, projector screen, laptop, scanning machine, printer, photocopier machine, hardware, software, rad io cassette, television, satellite dishes, handsets, Xerox machines and fax machines, whi ch facilitates human communications and also boosts educational frontiers. Due to this background this research is being conducted in order to assess the use of Information and Communications Technology in Tertiary Institutions in Katsina State.

1.2 Statement of Problem

In spite of the contributions and advantages which ICT has brought to all human endeavours such as improvement of the quality of education, simplifying the general administrative and management activities, expansion of the learning opportunities and making education accessible, much have not been done in its development in Katsina State, Nigeria. Few Tertiary Institutions in the State took a serious step in providing the necessary atmosphere and environment for the inclusion of Information and Communications Technology resources. The enormous increase in students' and lecturers' quest and pursuit for information, government and societal need for fast growth and development, has doubled over the years. This increase has called for the use of sophisticated equipment and facilities such as ICT resources for the processing, analysis and interpretation of raw data. It has been observed by experts, however, that ICT resources might not have been used effectively in institutions in Katsina State.

Inspite of the benefits attached to the use of ICT still there is problem in the area of application most especially in education. These have resulted in poor lesson delivery by lecturers, and low assimilation and comprehension of facts, ideas and information looking at the population explosion in our schools. Also, lecturers and students have become adamant in updating their knowledge through research and online investigations. Important activities such admission processes, public lectures and

announcements, classroom lecture presentations, grading, scoring and marking, result preparation and checking as well as general inter and intra school communications are still manually done, these are serious problems. It is further recognised that despite the fact that some institutions may be offering ICT related study programmes, most have relied on theoretical elucidation, explanation and description of concepts and ideas instead of the practical aspects of explanation and pedagogy. The benefits related to ICT use in education are enormous and unquantifiable but many foreseen and unforeseen factors have not allowed students, lecturers, government, society, individuals and other users to reap the benefits attach to it. Examples of these benefits are found in the social, economic, political and business experiences of the society. Therefore this research study wishes to investigate and assess the general use, problems and prospects of the use of ICT resources in Tertiary Institutions in Katsina State, Nigeria.

1.3 Objectives of the Study

The following objectives were raised to guide the study:

1. Determine the extent to which tertiary institutions are provided with ICT resources in Katsina State.
2. Assess the types of ICT study programmes offered in tertiary institutions in Katsina State.
3. Find out about the lecturers' access to ICT resources for teaching in tertiary institutions in Katsina State.
4. Find out about the students' access to ICT resources for learning in tertiary institutions in Katsina State.
5. Determine the lecturers' perception on the benefits of ICT resources in tertiary institutions in Katsina State.

6. Determine the students' perception on the benefits of ICT resources in tertiary institutions in Katsina State.

1.4 Research Questions

The study will seek to answer the following research questions:

1. To which extent are tertiary institutions provided with ICT resources in Katsina State?
2. Does tertiary institutions in Katsina State offer ICT related study programme(s)?
3. What are the ICT resources lecturers have access to for teaching in tertiary institutions in Katsina State?
4. What are the ICT resources students have access to for learning in tertiary institutions in Katsina State?
5. What are the lecturers' perceptions on the benefits of ICT in tertiary institutions in Katsina State?
6. What are the students' perceptions on the benefits of ICT in tertiary institutions in Katsina State?

1.5 Significance of the Study

The research will expose facts to both lecturers and students which will eventually instil into them the needed attitude towards understanding the significance of ICT in their research and learning activities as well as teacher-student interaction, and avail them more to the global challenges of modern techniques of accessing new information. For instance students will be exposed to typing skills and discovery, interpretation and analysis of new facts which otherwise couldn't have been possible without ICT. Lecturers would be able to undertake cumbersome and huge amount of their work simply and accurately. For example by calculating and presentation of student's results and grading and research works.

The research will be a useful tool for the government, policy makers in education at all levels thereby understanding the contribution of ICT in the socio-economic development of the state. With ICT, social interaction is enhanced, and the economy is developed because modern society and economic development depends largely on the level of ICT development of a country, (Anie, 2011). It is hoped that this research material will enable school managers, government and private individuals and organisation to understand the significance of ICT in today's life thereby provide more assistance to Tertiary Institutions (and other non-tertiary schools like primary, secondary schools etc) with the needed ICT resources and other forms of instructional materials. This would help in transforming the whole of educational activities viz production of admission lists, records keeping, scoring and marking, and even and effective administration of Tertiary Institutions in Katsina State.

1.6 Scope of the Study

The research work is on the assessment of the use of ICT in tertiary institutions in Katsina State, and will specifically cover tertiary institutions that are run and funded by Katsina State Government. The research was limited to state tertiary institutions in Katsina State; the information used was obtained from the Department of Higher Education Katsina State and also from the respected tertiary institutions. The lecturers, and students who were in the 2013/2014 academic session, precisely final year level will constitute the scope of the research. Reason for this selection is that the information received from these respondents will be able to give the researcher a picture and view of some of the efforts made by government in ICT development in Tertiary Institutions in Katsina State.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

In this chapter the researcher examine some of the relevant concepts which are related to the research this is hope to give a reader a clue of where the research is heading to. It will comprise among other thing theoretical framework, and the major concepts involved such as instruction technology, objectives of instructional technology educational technology, concept of information and communications technology, ICT in enhancing teaching and learning, advantages of ICT in education, ICT in tertiary institutions in Nigeria, tertiary institutions, the challenges and prospects of ICT use in tertiary institutions in Nigerian, and a comparative discussion of use of ICT in education in developed and developing nations.

2.2 Conceptual Framework

Concepts to be discussed include that of instruction technology, educational technology, Information and Communication, Technology, Teaching and Learning, Tertiary Institutions or education, ICT, advantages of ICT in teaching and learning process, challenges and prospects of using ICT in Nigerian tertiary institutions, and so on.

2.3 Instructional Technology

Instructional technology (IT) and Educational technology (ET) are two terms that are invariably used as the equal thing but they are somewhat different. Some definitions given by various authors will help us to understand each concept and a depicting table will be used to show these differences that exist among the duo concepts. Instructional Technology: Instructional technology was given two major characteristics as shown by Singh (2004) as the application of scientific knowledge to

the practical tasks' and 'the division of the practical tasks into sections and subsections. He further added that any subjects who meet these two norms of the characteristics are called instructional technology. Instructional technology is slightly different from educational technology due to scope.

Instructional technology is neither technology in education nor technology of education but all pervasive which pervades the whole teaching-learning process to make it meaningful for the teacher who teaches and the learner who learns and modifies his behaviour for his own betterment and the betterment of mankind. It is an aggressive invention in education which has a promising future in the hands of all those who are constantly engaged in the pursuit of knowledge, (Singh, 2004). Furthermore, instructional technology owes its origin to psychological laboratory experiments. The Commission on Instructional Technology (as cited in Venkatash, 2007) that IT is; the media born of the communications revolution which can be used for instructional purposes alongside the teacher, textbooks, and blackboards. And, a systematic way of designing, carrying out and evaluating the total process of learning and teaching in terms of specific objectives based on research on human learning and communication and employing a combination of human and non-human resources to bring about more effective instruction.

Experts like Mangal and Mangal (2010), viewed IT as a sub-system of educational technology which help the instructor or the learner himself as part of his self learning or auto instruction by determining the media, methods, or material for the realisation of the stipulated instructional objectives in a given teaching –learning situation. Singh (2004) produced additional definitions of IT gathered from various experts that include the followings that: instructional technology is the application of

scientific knowledge and learning and the conditions of learning to improve the effectiveness and efficiency of teaching and training.

Scientific knowledge and learning could encompass those things as new discoveries made under scientific regulations that comprise how human beings learn and interpret information. IT is the application of the laws as well as recent discoveries of science and technology to process of education. This include the materials used in teaching and learning example include slides, discs, computers, others are the infrastructure and those laid educational procedures such as contents, objectives, goals and methodology. In short, in the past, teacher talks with his voice alone but today he can employ the use of microphone, adoption of computer assisted learning and programmed instruction. Richmond viewed IT as that which is concerned to provide appropriately designed learning situations which, holding in view of objectives of teaching or training, being to bear the best means of instruction. E.E. Hadden asserted that IT is that branch of educational theory and practice concerned primarily with the design and use of messages which control the learning process. Messages which controlled the learning process refer to the content being delivered. The content of the information carries what form ‘meaning’ to the set objectives. In the view of Takashi Sakaamato IT is an applied or practical study which aimed at maximising educational effect by ‘controlling’ such relevant facts as educational purposes, educational environment, conduct of students and instructors (Singh, 2004).

IT is the identification, generation, application and evaluation of processes which create a purposeful, facilitating structure from available resources to enhance teaching and learning. Also further added that instructional technology has certain characteristics which is inherent to it among which include being helpful in achieving cognitive objectives; it can meet the shortages of effective teachers; it help students to

learn according to needs and speeds; it can control the individual differences etc (Audu and Agbo, 2010).

Why do we have to include IT in our today's effort to develop education? The followings as the objectives or reasons; to determine the goals and formulate the objectives in behavioural terms; to analyse the characteristics of the learner; to organise the content in logical or psychological sequence; to mediate between content and resources of presentation; to evaluate the learners' performance in terms of achieving educational objectives; and to provide the feedback among the components for the modification of learners. Interestingly the process of teaching and learning a new or already known fact or data is aimed at improving the needs of the learner and assisting him to acquire a skill which will benefit the whole society. As such IT must not try to forget these goals instead should make a giant effort in finding new way of achieving the set goals (Singh, 2004).

2.3.1 Objectives of Instructional Technology

Every designed programme must have objectives to achieve some may be in the long run while others in the short run. Whatever the time frame of attaining the set goals is, instructional technology meant to achieve the followings as its objectives: summarised the objectives of IT as making education more productive and more individual; to give instruction a more scientific base; and to make instruction more powerful, learning more immediate and access more equal. Having succinctly address the concept of IT, another vital concept which deserve treatment while discussing print media or anything relating to new instruction strategy, is that of Educational Technology.

2.4 Educational Technology

Educational technology, today is widely accepted as the application of systems approach in the systematic design of a learning system, and as a method or approach combined with the appropriate and necessary media and materials to bring about improvement in teaching-learning-evaluation process. It may, however, be noted that ET is neither an end in itself nor a concept that embraces all of education. Rather it can be considered as means to accomplish some predetermined, but clearly defined and unambiguous educational and instructional objectives, (Singh, Sharma and Upadhya, 2008). They added that ET is neither technology in education nor technology of education but both and all pervasive which pervades the whole teaching-learning process to make it meaningful for the teacher who teach and the learner who learns and modifies his behaviour for his own betterment and that of mankind.

Educational technology (ET) according to Venkatash (2007) inevitably centres on the so-called hardware. This emphasis results from the very restricted definition which said it is the art of using tools and machines, or the new media and technological systems employed for instructional purpose. Actually much more are involved in educational technology. Hardware, materials, systems of organisation and new roles for teachers and administrators are all part of ET. Bhoomireddy and Bhatia (2004) presented varied definitions which were authored by some experts. Among these are: National Council of Educational Technology (NCET) which said ET ‘‘is the development, application, and evaluation of systems techniques and aids to improve the process of human learning.’’ Mangal and Mangal (2010) sees ET as that which is concerned with application of modern skills and techniques to requirements of education and training. They added that ‘‘ET include the facilitation of learning by manipulation of media and methods, and the control of environment in so far as this

reflects on learning.'' It is the systematic application of scientific knowledge about teaching-learning and conditions of learning to increase the efficiency of teaching and training. Efficiency is very important in whatever a teacher does otherwise it will amount to time wastage. With educational technology in place teachers can design and implement educational programmes and objectives easily and with precision.

Moreover, Mitra (2001) said that ET is a science of techniques and methods by which educational goals could be realised. Science has brought in tremendous progress in the field of teaching and learning. A teacher mustn't have to suffer again in trying to pass information to a large number of students or solve compound problems because he can use loud speakers and internet in his teaching delivery. An overview of these definitions reveals that there exist wide differences of opinion regarding a particular definition of the term ET. These definitions initially encompass the whole range of ET activity from the analytic methods of psychology of learning and teaching to the audio-visual communication and mass media technology.

To simplify and ease understanding of the differences between ET and IT concepts, Aggarwal (2007) presented his findings in a tabular form as follows:

Table 2.1: Differences between IT and ET

Educational Technology	Instructional Technology
1. It has a wider concept, including instructional technology.	1. It is a part of educational technology.
2. Goals are decided in the context of the needs of a nation.	2. Goals are determined in the context of the local needs.
3. Behavioural outcomes are determined keeping in view the ultimate needs of a nation.	3. Behavioural outcomes are determined keeping in view the specific expectation of the learners.
4. Attempts are made to discover the competencies and skills of learners all over the nation.	4. Competencies and skills of the learners of a locality are discovered.
5. Selection of educational media is made for making teaching and learning more effective in several schools of a region.	5. A given class or school is the unit for the selection of educational media for making teaching and learning more effective.
6. Teaching materials is produced on a large scale.	6. Limited material is produced according to local needs.
7. Feedback is obtained at national level.	7. Feedback is obtained at local levels.

Source: Aggarwal (2007)

With the table above, we can notice that the two concepts are not directly the same' they seriously differ in one way or the other. When we analyse what is contained in the above table, the concepts and contents in IT are an embodiments of the ET most especially in the first level of categorisation and so many other differences.

2.5 Information and Communications Technology

In the view of Owhotu (2006), information means intelligence generating knowledge and internal vent important for learning. Information is a one-way process of discovering, storing, and retrieving science and technology knowledge, skills and techniques by respective individuals. To be informative is to have power to inform and instruct. Whereas he added that communication means what and how information gets

across and is quite distinct from the concept of communication. It is an integral part of information and is interpersonal. Without communication there cannot be dissemination of knowledge. Without information, there cannot be communication. Consequently, teaching and learning occurs only when what is being imparted and assimilated are effectively informed and communicated.

Singh (2004), technology implies the application of science to art. He further said when we apply the science of learning and communication to teaching we evolve a technology. The interaction of physical sciences with education provides us with traditional aids tools, hardware such as pager, ink, books, radios, lingua phones, films, televisions (TV) and more sophisticated modern hardware like computers, space-satellite, language laboratories etc. Lahkar (2013) defines technology as a systematic application of scientific learning. In the view of Kadage (2012) while linking technology to education, he said it is an increasing influential factor which developed countries used both to complement established education practices and develop new ways of learning such as online education.

According to Hornby (2003), technology is the application of scientific knowledge for practical purposes. There is this believe that concrete objects are more understood than abstract ones. Teacher always try to make what he teach as concrete as possible by the use of instructional technological innovations. We shall bear in mind that the role of technology of instruction can make an ordinary person capable of superior performance and means, either printed or electronic, to distribute that instruction (Venkatash, 2007).

Therefore Information and Communications Technology (ICT) has become, within a very short time, one of the basic building blocks of modern society. Many countries now regard understanding ICT and mastering the basic skills and concepts of

ICT as part of the core of education, alongside reading, writing and numeracy (UNESCO, 2002). Ghelani, Kadage (2012) asserted that ICT stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information."

ICT in this aspect of study is centred most in the use of computer and internet in gathering, collating, analysis and interpretation of data or information most especially in the field of education- teaching and learning process. Internet, according to Mohanty and Vohra (2008), is sometimes referred to as the mother of all networks. It is the interconnected network of computers or worldwide electronic connections of computers and their networks. Internet takes a myriad of forms, notably online internet phone and multimedia, (Owhotu, 2006). Asiabaka (n.d.), stated that Information and Communications Technology (ICT) is a collective term covering all those technologies, both hardware and software, dedicated to the capture, storage, processing, transmission, and presentation of information.

With thousands of computers all over the world connected to each other through satellite, cables, and radio waves, the information stored in those computers can be shared. Mohanty and Vohra (2008) asserted that the world has become a small village owing to the use of internet. Virtually anybody with an internet connection can contact another person sitting anywhere in the world through e-mail, online chat, and video conferencing. It is also vast repository, ordnance or storeroom on information on a wide range of topics which can be retrieved at the mere click of a mouse and has influenced all spheres of life ranging from business, agriculture, health, general administration and education. They added that, schools have found internet as an effective tool in their teaching and learning processes.

The followings figures are some of the examples of common ICT resources that are used in tertiary institution.



Figure 1: A Desktop Computer
(Source: www.m.shutterstock.com/search?...)



Figure 2: A Laptop Computer
(Source: www.m.123rf.com/ photos-images)



Figure 3: A Television Set
(Source: www.photobucket.com/images/television%20set)



Figure 4: A Camera
(Source: www.imaging-resource.com/)



Figure 5: A Printer
(Source: www.zan1011.com/download.htm)



Figure 6: A Disc Plate
(Source: www.daemon-tools.cc/downloads)



Figure 7: A Screen Reader
(Source:
www.martinkennethbayne.typad.com/acoustic_enhancement/science/)



Figure 8: A Scanner
(Source: www.en.m.wikipedia.org/wiki/image_scanner)



Figure 9: A Loudspeaker
(Source: www.m.shutterstock.com/search?q=loudspeaker)



Figure 10: A Microphone
(Source: www.artsites.ucsc.edu/ems/.../teces_20.html)



Figure 11: A Photocopy Machine
(Source: www.m.snapdeal.com/.../office-equipment-)



Figure 12: A Smart Board
(Source: www.http://smarttech.com/~/media/imagessmartboard)



Figure 13: A Typewriter
(Source: www.photobucket.com/images/typewriter)



Figure 14: A Projector
(Source: www.en.m.wikipedia.org/wiki//projector)



Figure 15: A Radio Set
(Source: www.audioenglish.org/.../radio_set.htm)

2.5.1 ICT in Enhancing Teaching and Learning

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research. ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change, (Noor-Ul-Amin, n.d.). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. Such ability must find include ICTs in the global village.

Conventional teaching has emphasized content. For many years course have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasize capabilities and to be concerned more with how the information will be used than with what the information is. Contemporary ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance-based curricula that make sound use of the affordances of these technologies, Oliver (as cited in Noor-Ul-Amin, n.d.).

The integration of information and communication technologies can help revitalize teachers and students. This can help to improve and develop the quality of education by providing curricular support in difficult subject areas. To achieve these objectives, teachers need to be involved in collaborative projects and development of intervention change strategies, which would include teaching partnerships with ICT as a tool. According to Zhao and Cziko (as cited in Noor-Ul-Amin, n.d.), three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should

believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology.

However, research studies show that most teachers do not make use of the potentials of ICT to contribute to the quality of learning environments, although they value this potential quite significantly. Experts concludes that the benefits of ICT will be gained "…when confident teachers are willing to explore new opportunities for changing their classroom practices by using ICT. As a consequence, the use of ICT will not only enhance learning environments but also prepare next generation for future lives and careers, (Noor-Ul-Amin, n.d.). According to Cabero, 2001 (as cited in Noor-Ul-Amin, n.d.), "the flexibilization time-space accounted for by the integration of ICT into teaching and learning processes contributes to increase the interaction and reception of information. Such possibilities suggest changes in the communication models and the teaching and learning methods used by teachers, giving way to new scenarios which favour both individual and collaborative learning".

In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission, Duffy and Cunningham, 1996 (as cited in Noor-Ul-Amin, n.d.).

Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centred settings and by enabling learning to be related to context and to practice, Berge and Barron (as cited in Noor-Ul-Amin, n.d.). As mentioned previously, any use of ICT in learning settings can act to support various aspects of knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become. Teachers generate meaningful and engaging learning experiences for their students, strategically using ICT to enhance learning. Students enjoy learning, and the independent enquiry which innovative and appropriate use of ICT can foster. They begin to acquire the important 21st century skills which they will need in their future lives.

In the opinion of Ghelani (2012) education policymakers and planners must first of all be clear about what educational outcomes are being targeted; these broad goals should guide the choice of technologies to be used and their modalities of use. The potential of each technology varies according to how it is used. Haddad and Drexler, 2002 (as cited in Agbetuyi, 2012) identified at least five levels of technology use in education: presentation, demonstration, drill and practice, interaction, and collaboration.

He added that each of the different ICT - print, audio/video cassettes, radio and TV broadcasts, computers or the Internet - may be used for presentation and demonstration, the most basic of the five levels. Except for video technologies, drill and practice may likewise be performed using the whole range of technologies. On the other hand, networked computers and the Internet are the ICT that enable interactive and collaborative learning best; their full potential as educational tools will remain unrealized if they are used merely for presentation or demonstration.

According to Siddiqui (2004), ICT has been used for educational purposes. This made it to be vital in the teaching and learning process. He classified it into three forms: as object, aspect or as medium. The use of ICT in education as object refers to learning about information technology and is mostly organised in a specific course such as 'computer education' or 'informatics'. ICT as aspect refers to specific applications of ICT in education as used in industry, business and professional practice. Our interest here would be on the medium form which is much connected to teaching-learning situation. In continuation of analysis, Siddiqui (2004) reasserted that ICT as a medium of teaching and learning connotes it to be as a tool for teaching and learning itself, that is, the medium through which teachers can teach and learners can learn. He further added that ICT as a medium appears in many different forms such as in drill and practice exercise in simulation, in tutorials, in Individual Learning Systems (ILS), in educational networks, in hypermedia programs, in test-generating systems, etc.

However, the use of information and communication technologies in the educative process has been divided into two broad categories: ICTs for Education and ICTs in Education. ICTs for education refers to the development of information and communications technology specifically for teaching/learning purposes, while the ICTs in education involves the adoption of general components of information and communication technologies in the teaching learning process, Noor-ul-Amin (n.d.). Siddiqui (2008) in his contribution titled 'Changing the Face of Teaching' tried to show the relevance of using computer which is a form of ICT, that in principle, ICTs have greatly increased the amount and range of information available. Reddi (n.d.) viewed ICTs as that which are often associated with the most sophisticated and expensive computer-based technologies. But ICTs also encompass the more conventional technologies such as radio, television and telephone technology. He further argued that,

while definitions of ICTs are varied, it might be useful to accept the definition provided by United Nations Development Programme (UNDP) which says that 'ICTs are basically information-handling tools- a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the 'old' ICTs of radio, television and telephone, and the 'new' ICTs of computers, satellite and wireless technology and the internet. These different tools are now able to work together, and combine to form our 'networked world'. Likewise Osakwe (2012) sees ICT as the science that investigates the properties and behaviour of information, the force governing the flow of information and the means of processing information for optimum accessibility and usability. The process includes the origination, collection, storage, retrieval, interpretation, dissemination and use of information.

ICT is a broad term that has to do with the harnessing of process, the methods and the product of electronic communication related technologies and other related resources in today's knowledge driven society, for enhancing the productivity, the spread and efficiency of set programme activities geared towards the achievement of clearly defined goals. ICT is an eclectic application of computing, communication, telecommunication and satellite technology (Osakwe, 2012).

Having outlined various definitions of ICT we found it extremely important to identify some of the advantages that could be gained in the use of ICT resources most usefully in education or teaching and learning area. The field of education has not been unaffected by the penetrating influence of Information and Communications Technology. Undoubtedly, ICT has impacted on the quality and quantity of teaching, learning, and research in traditional and distance education institutions, (Yusuf, 2005). In concrete terms, ICT can enhance teaching and learning through its dynamic,

interactive, and engaging content; and it can provide real opportunities for individualised instruction. Information and Communications Technology has the potential to accelerate, enrich, and deepen skills; motivate and engage students in learning; helps to relate school experiences to work practices; helps to create economic viability for tomorrow's workers; contributes to radical changes in school; strengthens teaching, and provides opportunities for connection between the school and the world. Also, Information and Communications Technology can make the school more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' professional activities, (Yusuf, 2005).

In research, ICT provides opportunities for schools to communicate with one another through email, mailing lists, chat rooms, and so on. It also provides quicker and easier access to more extensive and current information, and it can be used to do complex mathematical and statistical calculations. Furthermore, it provides researchers with a steady avenue for the dissemination of research reports and findings, Yusuf and Onasanya (as cited in Yusuf, 2005). ICT has contributed to effective learning through expanding access, promoting efficiency and improving the quality of learning and improving management systems. It is now regarded as a utility such as water and electricity and hence has become a major role in education, learning and research in general, agriculture, and health and even in poverty alleviation by generating or creating new jobs and investment opportunities. Students become more aware about how to learn when using ICT because they must interact with computer. ICT has also changed the relationship between students and lecturers and has made it open and intimate. The idea of sharing knowledge and the capability of using new resources for learning are enhanced by using ICTs. It has also helped undergraduates in better communication and access to information. This is due to the fact that there is a national policy supporting

ICT in schools. It has also helped students' curiosity and motivation that has in turn forced the lecturers to seek more knowledge, (Agbetuyi and Oluwatayo, 2012). Voogt, 2003 (as cited in Mikre, 2011) tried to explain some of the most important functions of ICTs in education where he pointed out the followings to represent his views thus:

1. ICT as an 'assisting tool'. ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating, and conducting research. Typically, ICT is used independently from the subject matter.
2. ICT as a medium for teaching and learning. This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, in simulations and educational networks.
3. ICT as a tool for organization and management in schools.

This resemble what Siddiqui (2004) opined in his book titled ''Technology in Teacher Education,'' that potential advantages of using ICT for the teaching and learning process are that, it can help students learn at their own pace, provide them with unlimited sources of information, offer access to other learners and mentors which can be motivating for students of all ages. He added that using ICT as a learning medium offers students the opportunity to learn to collect information, organise their thinking, give meaning to information, revise their work, collaborate on projects with others, and present knowledge to audiences. Also, ICT allows the student to focus on real problems, make connections to different fields of interest and construct their own knowledge, (Siddiqui, 2004).

Therefore we can say, without any doubt, the specific benefits or advantages related to ICT are because it has been able to alter the role of the teacher who used to be

the only source of information vital for learners' consumption. It has also make students to be active participants in the teaching and learning process. Siddiqui (2004) added that ICT has made access to information resources expanded significantly; learners became more independent; access to teachers became equal and direct; on the parts of teachers, interactions increased significantly; education became learner-centred; and the teacher-learner hierarchy broke down thereby making teachers became learners, and learners became teachers. In the words of Tinio (2002) (as cited in Agbetuyi and Oluwatayo, 2012), ICTs are powerful enabling tools for educational change and reform. When used appropriately, helps expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life.

In Nigerian educational system, ICT has helped to increase access to and improving the relevance and the quality of education. It greatly facilitate the acquisition and absorption of knowledge, offering developing countries unprecedented opportunities to enhance educational systems, improve policy formulation and execution and widen the range of opportunity for business and the poor. This new communication tends to reduce the sense of isolation, and open access to knowledge. This is enhanced because ICT provides access anytime and anywhere by making possible asynchronous learning. Online course materials, for example, can be accessed 24 hours a day, 7 days a week. ICT based educational delivery like educational programming broadcast over radio and television also dispenses with the need for all learners and the instructor to be in one location. In addition, certain types of ICTs such as teleconferencing technologies enable instructions to be received simultaneously by multiple, geographically dispersed learners (Synchronous learning).

Mohanty and Vohra (2008) showed the followings as advantages of using ICT in teaching, that, learners are able to access high-quality teaching and learning at any time and place. Information previously available only through a professor or an instructor is accessible on demand through computers and the Internet, they added. Also, well-designed multimedia learning materials can be more effective than the traditional classroom methods because students learn more easily and quickly through illustrations, animation, different structuring of materials, and increased control of interaction with learning materials. New technologies can be designed to develop and facilitate higher order learning skills, such as problem solving, decision making, and critical thinking. Furthermore, interaction with teachers can be structured and managed through online communications to provide greater access and flexibility for both students and teachers. Lastly, computer-mediated communication can facilitate team teaching, use of guest faculty from other institutions, and multicultural and international classes.

For this reason, Mohanty and Vohra (2008) summarised the advantages of ICT in education as: Empowerment (students feel more powered in hand), Engagement (students get to collect data and analyse them), Authenticity (students feel that technology has helped them), and Leading with technology (students feel technology will give them an edge in the latter part of their life.

2.5.2 ICT in Tertiary Institution Administration

The traditional method of storage, preservation and presentation of large volume of information in print media has failed to facilitate the work of the educational administrator; consequently, ICT became indispensable in the administration of Tertiary Institutions. According to Hawkridge, Jaworski and McMahon, 1990 (as cited in Asiabaka, n.d) computers are at the heart of the ICT revolution because they are fast

information processing machines, configured to receive input in the form of information, systematically process the input and provide organized information that serves the needs of the user. It has the advantage of improving administrative efficiency and overall quality of the teaching and learning process. The administrator of Tertiary Institutions, are constantly making decisions, planning, organizing, communicating, influencing, coordinating, and evaluating, consequently, they need good information. Information and Communications Technology (ICT) is technology-based and knowledge driven and is indispensable in all spheres of human activities in the present age. In view of the importance attached to ICT, it is necessary to determine the availability, extent of use, and constraints to the use of ICT by educational administrators in Tertiary Institutions in Katsina State.

2.6 Tertiary Institutions

While deliberating on the nature of Tertiary Institutions in Nigeria, Umo, 1999 (as cited in Osakwe, 2012) asserted that Tertiary Institutions play essential roles in human resource development and promote high quality education capable of offering clear directions in most endeavours designed for purposes of quality living. They help in creating, supporting and propelling knowledge-driven economic strategies, and the empowerment of the citizens. Tertiary Institutions have been described as parastatals which award professional and non-professional certificates. They are involved in providing higher education opportunities. In view of this, Asiabaka and Oku (n.d) tried to point what Tertiary Institutions are and why they were established most especially in respect to Nigeria, it is certain that Tertiary Institutions offer tertiary education. They maintained that tertiary education is the type of education given in such institutions as Universities, Polytechnics, Mono-techniques, Colleges of Education and their affiliates.

Traditionally, they are established for the broad purposes of teaching, research, dissemination of knowledge and community service.

They further pointed that these institutions are unique in the sense that they have high concentration of individuals involved in the pursuit of knowledge. According to Federal Republic of Nigeria (FRN), (as cited in Asiabaka and Oku, n.d), the goals of tertiary education in Nigeria shall be to Contribute to national development through high level relevant manpower training, development and inculcate proper values for the survival of the individual and society, develop the intellectual capability of individuals to understand and appreciate their local and external environments, acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the society, promote and encourage scholarship and community service, forge and cement national unity; and promote national and international understanding and interaction.

It further stipulates that tertiary educational institutions shall pursue these goals through; teaching; research and development; virile staff development programme; generation and dissemination of knowledge; others are a variety of modes of programmes including full-time, part-time, block-release, day-release, sandwich, etc; access to training funds such as those provided by the Industrial Training Fund (ITF); Students' Industrial Work Experience Scheme (SIWES); maintenance of minimum educational standards through appropriate agencies; Inter-institutional co-operation; and dedicated services to the community through extra-mural and extension services. The roles expected of the Tertiary Institutions in a given country cannot be overemphasised these encompass among other things like social, economic political and indeed educational endeavours. There are significantly number of Tertiary Institutions which are spread across Katsina State serving wide range of objectives via distinct teaching

and learning styles. While some adopt modern methods others still uses traditional technique in achieving the set educational and instructional goals.

The traditional method involved the common way in which teacher-talk and learner-listen to the instruction. This has to change for the better where vital information which was not available to the learner would be made available and accessible. This led to the introduction of ICT into the educational sector covering all the educational levels available in the state.

2.6.1 The Challenges and Prospects of ICT Use in Tertiary Education in Nigeria

Despite the functions, uses, benefits and advantages stated above which could be achieved as a result of ICT application in the teaching and learning process, still in Nigeria a lot of factors have continued to affect proper development and implementation. Among the major problems as indicated by Oshodin and Idehen, 2007, (as cited in Osakwe, 2012), are poor installation of ICT related facilities, these include computer hardware and software, television sets, internet connections etc; irregular electricity/power supply, which has not allowed intending ICT users to enjoy the full bits of the system and poor maintenance culture Nigerians. People do not care about maintenance of ICT resources provided to them most especially if those items were supplied by the government; all are among factors considered as problems facing ICT usage in Tertiary Institutions in Katsina State. Other problems as noted for by Aduwa-Ogiegbaen and Iyamu (2005) include cost of resources, weak infrastructure, lack of skills, lack of relevant software, limited access to the internet.

From the researchers view other factors that are considered to be among the problems that affect ICT usage are lack of concrete and well defined curriculum that is design for such purpose. We have curricula that are currently considered as new which are taught in our various levels of study such as civic education, animal husbandry

being offered in secondary school level and entrepreneurship in the Tertiary Institutions. Although computer science is taught at certain educational levels, this subject is only taught at basic level. It is a starting point at the right direction.

ICT surpasses the use of computer basic knowledge alone, it is as wide as more than what is expected. From the views given by Akudolu, 2002 and Adebayo, 2002 (as cited in Nbina and Obamanu, 2011) ICT covers the use of computers, online self-learning packages, interactive CDs, satellites, radio, optical fibre technologies, tele-presence systems and all types of information technology (IT). Olagunju, 2002 (as cited in Nbina and Obamanu, 2011) said in order to attain these skills; there is need for users to be computer literate. There are different ways via which individual could be literate in computer which could be through acquisition of an ordinary certificate, national certificate of education, national diploma, higher national diploma or degree.

Furthermore, Siddiqui (2004) posited other points as reasons for low usage of ICT in education thus insufficient numbers of computers, lack of release time for teachers or lecturers to learn how to use computers or the internet and lack of time in schedule for students to use computers in class. Mohanty and Vohra (2008) pointed the followings as obstacles to ICT in education thus, insufficient number of computers, teachers lack knowledge and skills, difficult to integrate query into instruction, scheduling computer time, insufficient peripherals, not enough copies of software, insufficient teacher time, not enough simultaneous access to world wide web (www), not enough supervision staff, and lack of technical assistance.

Owhotu (2006) asserted the followings as constraints for ICT usage in Tertiary Institutions in Nigeria including Katsina State, this include inadequate power supply, financial constraints, inadequate/lack of expertise, bureaucracy in administering ICT in

teaching and learning periods, distance, space and time, moral and ethical values, and lack of feedback.

Having briefly talked about the problems associated to the use of ICT in Nigeria, it will be imperative to look at the possible solutions so as to make ICT accessible to all and sundry. Katsina State government must take a concrete and real step to solve, once and for all, the issue of energy problem. This provides the teaming students and teachers to exploit and make full utilisation of this newly found technology. Another possible solution is for the Katsina State government to create an enabling environment for lecturers to go for in-service programme in order to be computer literate. This shall be supported with the supply and distribution of personal computers to lecturers and students.

Moreover, state government should design a curriculum that will directly deal with ICT knowledge so that the kind of consideration given to all other subjects should also be given to it. This will provide an opportunity for new teachers and lecturers to emerge. Schools should be adequately provided with ICT resources and laboratories and many other important rooms for every intending user. Katsina state has listened to calls in order to improve ICT knowledge accessibility by the recent construction of an ICT and business school in the state which is situated along Katsina-Batagarawa new ring road.

2.7 A Comparative Analyses of Use of ICT in Education in Developed and Developing Nations

For the sake of introduction, in the more advanced industrialized nations, there has been a staggering amount of research and publication related to ICT use for educational purposes during the past decade. Today, nearly everyone in the industrialized nations gained access to ICT and the purchase of computers for school use in such nations as the United States has been increasing in such a pace that is

difficult to keep track of how many computer machines are now in American schools, Harper, 1987 (cited in Aduwa-Ogiegbaen and Iyamu, 2005).

Becker, 1986 (as cited in Aduwa-Ogiegbaen and Iyamu, 2005) reported a comprehensive survey of the instructional uses of computers in United States public and non-public schools. The report suggested that over one million computers were in American elementary and secondary schools and more than fifteen million students used them during 1985. The report also says half-a-million teacher used computers during the same period and that half of U.S.A. secondary schools (about 16,500 schools) owned 15 or more computers. Also, over 7500 elementary schools owned 15 or more computers.

It has been almost two decade since the figures quoted above were released. There is no doubt that those figures would have increased tremendously since then. Bergheim and Chin, 1984 (as cited in Aduwa-Ogiegbaen and Iyamu, 2005) reported that the US government made available $529 million to schools out of which 60 to70 percent was spent on computer education. However, in the US administration's fiscal 2001 budget, more than $900 million was earmarked for educational technologies Hess and Leal, 2001 (as cited in Aduwa-Ogiegbaen and Iyamu, 2005).

In Britain, the story is the same as the wider availability of computers in schools was made possible through government funding largely through the Local Education Authorities (LEA). Visscher et al, 2003 (as cited in Aduwa-Ogiegbaen and Iyamu, 2005) reported that following the Education Reform Act in 1988, the central government made available $325 million, over time, to promote the use of computers in school administration and management. Just as the United States and Britain have been budgeting huge sum of money for cyber education, so have other developed nations been doing same.

Even many developing nations have embraced ICT. In Africa, concerted efforts have been made by many governments to initiate Internet connectivity and technology training programs. Such programs link schools around the world that in order to improve education, enhance cultural understanding and develop skills that youths need for securing jobs in the 21st century. In Uganda, an interconnectivity programme known as "Uganda School Net" is dedicated to extending educational technology throughout Uganda Carlson and Firpo, 2001 (as in Aduwa-Ogiegbaen and Iyamu, 2005). In Senegal, teachers and students are using computers extensively as information tools. These programs in African countries mentioned are supported by their government through the ministries of Education.

The use of ICT in teaching and learning process over world nations most especially those called 'developed' nations is quite significantly large than that of the 'developing' ones, Nigeria inclusive. For example, Hong Kong a part of the Mainland China through its educational programmes called The Education and Manpower Bureau of the Government of Hong Kong (2004) in a Plan titled ''Five Year Strategy'' maintained how it determined to change and enhance the use of ICT in the whole of the country. In the first section of the Plan it stated that the past five years saw the introduction of information technology in education in Hong Kong. With the concerted efforts of schools, teachers, Tertiary Institutions, the private sector and other relevant organizations, have begun to reap harvest.

The report has shown how the necessary infrastructure were laid, provided teachers with the basic training on the use of information technology, and collected a rich repository of digital education resources. Regional centres of information technology excellence have emerged, innovative pedagogies and practices have surfaced, and students' generic information technology skills have improved. The

plan, while discussing about the access and connectivity found that on average, each primary school now has 91 computers while secondary school has 247. These are well above the original targets of 40 in primary schools and 82 in secondary schools now in the Five year Strategy. All schools have broadband connection to the Internet, with over 60% of them having fibre access and enjoying 10 to 100 Mbps bandwidth. Also, Hong Kong has a household personal computer (PC) and internet penetration rate of 68% and 60% respectively in 2003. Some students have limited access to computers after school. An incentive grant has therefore been provided for over 1,000 schools to extend the opening hours of their computer rooms/resources for use by students.

The Plan recognizes the important role of teachers as the enabler of IT in education. At the end of August 2003, all teachers (about 50,600 including 4,600 teaching assistants) have completed IT training at the Basic Level, 35,600 (77%) teachers at Intermediate Level, 12,500 (27%) teachers at Upper Intermediate Level and 2,600 (6%) teachers at Advanced Level. The Education and Manpower Bureau (EMB) provided refresher training courses, seminars and workshops to keep teachers abreast of IT developments. The Hong Kong Education City (HKEdCity), an education portal in Hong Kong, has also organized various activities to promote IT solutions to schools. Additionally, Collaboration among schools has been fostered through a territory-wide network of "Centres of Excellence on IT in Education" (CoE) comprising some 20 schools in various districts. The CoE provided professional support to schools to help meet the goals of the Five-year Strategy.

In 2000, the "Information Technology Learning Targets" (Curriculum Development Council, 2000) were issued, paving the way for the integration of IT into the curriculum. To support primary schools in implementing the learning targets, a computer awareness programme comprising eight learning modules was developed. The

curriculum reform document "Learning to Learn – The Way Forward in Curriculum Development" published by the Curriculum Development Council (CDC) in 2001 reinforced the role of IT as a tool to support the reform measures.

The "Basic Education Curriculum Guide – Building on Strengths" published by the CDC in 2002 provides, among others, guidance to schools on fostering an appropriate environment for interactive learning with IT, and making appropriate use of IT in teaching various subjects. As Hong Kong's market for education software was then at an early stage, EMB assumed the dual role of forerunner and facilitator in the production of curriculum resources in the past five years. The education software developed by EMB helped the private sector and other parties understand the needs of schools. In just a few years, schools, teachers, Tertiary Institutions, the private sector and non-government organizations (NGOs) have produced a remarkable volume of curriculum resources and materials. Many are available for sharing online and at physical resource centres.

Supported by the Quality Education Fund, the HKEdCity was launched in August 2000 to serve and promote quality education and IT for lifelong and life-wide learning. It quickly became one of the most popular education portals in Hong Kong, offering rich learning resources and education contents, facilitating learning communities and organizing promotional activities. The HKEdCity was corporatized in 2002 and continues to receive support from the Government to develop into an e-learning and e-business platform for teachers, parents and students. Expositions, activities and competitions have been held to promote the use of IT in education. Programmes have also been held in collaboration with schools, professional bodies and private companies. This is the situation in Hong Kong which is a part of the mainland

China which has also transformed its educational system to the current needs of its technological advancement.

In Singapore, the use of ICTs in the educational system is not a new thing. The federal government has introduced variety of programmes that make the use of ICT a success. The Ministry of Education of the Singaporean Government has developed three master plans regarding the use of ICT in the educational sector. In this research I concentrated on the third master plan which is latest and new, although the plans might share some sort of similarity in objectives.

The major objectives of these master plans is to enrich and transform learning environments of our students and equip them with the critical competencies and dispositions to succeed in a knowledge economy, (Singapore MOE, 2008). The government furthermore states the strategies she felt could be used in achieving this master plan which include the followings; To strengthen integration of ICT into curriculum, pedagogy and assessment to enhance learning and develop competencies for the 21st century, to provide differentiated professional development that is more practice-based and models how ICT can be effectively used to help students learn better, to improve the sharing of best practices and successful innovations; and to enhance ICT provisions in schools to support the implementation of Master Plan three (3), (Singapore MOE, 2008).

In the case of Nigeria, a country regarded as one of the developing nations did not play with the contributions offered by ICT. ICTs are making dynamic changes in society. They are influencing all aspects of life. The influences are felt more and more at schools. Because ICTs provide both students and teachers with more opportunities in adapting learning and teaching to individual needs, society is, forcing schools aptly respond to this technical innovation, (Mikre, 2011).

Nigeria as a nation has recognized the potential of ICT in her educational system. The national policy on computer education emphasized the need for the integration of ICT into the Nigerian educational system. This dates back to the National Policy on Computer Education, FME (cited in Agbetuyi and Oluwatayo, 2012) which emphasized the need for primary school pupils to be introduced to the basic computer skills, the use of the computer to facilitate learning and rudimentary use for text writing, computation and data entry. For secondary school, they have related goals which were to be achieved at higher level. The Tertiary Institutions were also required to teach computer science as a discipline and to integrate it in school administration and instruction. However, the implementation was not effective, (Agbetuyi and Oluwatayo, 2012).

They added that three major objectives, among others were emphasized in the Nigerian National policy for Information Technology (FRN, 2001). These are to empower youths with ICT skills to prepare them for competitiveness in a global environment, integrate ICT into the mainstream of education and training and establishment of multifaceted ICT institutions as centres of excellence of ICT, (Agbetuyi and Oluwatayo, 2012). The main purpose of ICT in education means implementing of ICT equipment and tools in teaching and learning process as a media and methodology. The purpose of ICT in education is generally to familiarize students with the use and workings of computers, and related social and ethical issues. ICT has enabled learning through multiples intelligence as it has introduced learning through simulation games; this enables active learning through all senses (Agbetuyi and Oluwatayo, 2012).

2.8 Empirical Study

Empirical research study is a way of gaining knowledge by means of direct and indirect observation or experience. In other definition, it is based on observed and measured phenomena and derives knowledge from actual experience rather than from theory or belief. Therefore in this study Assessment of the use of ICT in Tertiary Institutions of Katsina State, the researcher was able to observe that the level of use of ICT is very. Evidences gathered from various Tertiary Institutions visited are that most of them do have some form of ICT resources or the other but the actual usage of it for varied academic and non-academic activities is not poor. Among the reasons observed include inadequate supply of energy, lecturers and students incompetency in operating some or most of the ICT resource materials (lack of operating skills). Other reasons such as poor provision of periods for effective utilisation of ICT materials during lecture hours and government nonchalant attitude towards ICT development do also constitute a significant problem.

This situation is not only common in Katsina State rather in the entire states of the federation. For example, in a research reported by Asiabaka and Oku(n.d) about the use of ICT in Imo State tertiary institution by administrators. The resulted showed that 80.61% of the administrators of Tertiary Institutions in Imo State used the computer for administrative purposes always, 66.33% never used the printers, and 66.33% used e-mail always in communication. The table also showed that 59.18% used the internet facility always while 83.67% used the computer always.

The methodology used in carrying out the study is the survey method. Data for the research work was collected with the use of questionnaire, which was administered to the administrators of tertiary institutions in Imo State of Nigeria. The instrument solicited for information on the administrators' access, use and constraint to the use of

selected ICTs for administrative purposes. The population of the study comprised of all the individuals holding administrative positions in Federal University of Technology, Owerri, Imo State University, Owerri, Alvan Ikoku College of Education, Owerri, Federal Polytechnic Nekede and Micheal Opara College of Agriculture and Technology, Umuagwo. They include, Principal Officers, Deans, Directors, Heads of non-academic Units. The systematic random sampling technique was used to select 98 administrators in these institutions.

The conclusion and recommendations in this section pointed that there is the need for a well articulated, needs assessment to be carried out to determine priority areas for ICT intervention in education in Nigeria. The Federal and State Governments should put in place explicit policy guidelines for the use of ICT in the administration of tertiary institutions. Provisions for the implementation of these policies should be made and monitored to ensure compliance. Training of administrators should be given priority attention and should include basic computer literacy, email, search engines, website design, and the integration of technology into the classroom. The training should be either in-service or pre-service. Seminars and workshops should form a major method of in service training.

Tertiary institutions should establish linkages with funding agencies such as; World Bank's Link for Development (WorLD), the International Development Research Centre (IDRC), the International Education and Resource Network (IEARN) and the Department for International Development (DFID), Schools Online, and the Swedish International Development Cooperation Agency (SIDA). The government should ensure adequate funding of ICT. This should include capital and recurrent funds for provision and maintenance of ICT facilities such as hardware and software,

installation, expansion of existing facilities, telecommunication, phone lines, pre-service and in-service training of educational administrators and technical support staff.

2.9 Summary

In this chapter we have been able to discuss concepts related to ICT such as the concept of teaching and learning and how ICT resources is used in order to improve the whole educational programme-teaching, learning, research and development. In the view of Siddiqui (2004), ICT as a medium of teaching and learning connotes it to be as a tool for teaching and learning itself, that is, the medium through which teachers can teach and learners can learn. This means that with the introduction of ICT simplicity and flexibility has been brought in to the education sector in Nigeria.

This vital development in the education sector has contributed greatly in shaping how new facts are acquired by both the teacher and the learner which led to the current revolution in education. Research and presentation by lecturers has been eased and comprehension level increase. Mohanty and Vohra (2008) summarised the followings as advantages or reasons of using ICT in tertiary institutes, that, learners are able to access high-quality teaching and learning at any time and place which the researcher believe it's a right thing to have happened.

In the words of Tinio (as cited in Agbetuyi and Oluwatayo, 2012) ICTs are powerful enabling tools for educational change and reform. When used appropriately, helps expand access to education, strengthen the relevance of education to the workplace, and raise educational quality by creating an active process connected to real life. A point of observation here is how should we know that a particular ICT resource is appropriately been used for it to yield a desired result. Whatever the argument that arises due to the application of ICT in the educational sector one fact that is certain is that it is a new tool and medium that makes academic activities simple and interesting.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the pattern and methodology that was adopted in conducting the research study. The research was carried out based on the following subheadings thus: design of the study, population, sample and sampling technique, validity, reliability, instrumentation, pilot testing, procedure for data collection, procedure for data analysis and responses presentation.

3.2 Research Design

This study adopted the survey research design as it desires to assess the use of ICT in Tertiary Institutions in Katsina State, Nigeria. The reason for choosing this design is to allow the researcher to gain an insight into the feelings, opinions, awareness and appreciation of Lecturers and Students of Tertiary Institutions in Katsina State towards the use of ICT. Other researchers such as Adeyemi and Olaleye (2010) have made good use of the design and collected a reliable result. Also, Sambo, Best and Khan (as cited in Suleiman, 2013) supported the use of descriptive survey design which sought to assess the perceptions of a large number of participants within a specific period of time.

3.3 Population

The target population of this study comprises of Umar Musa Yar'adua University (UMYU) with 452 number of lecturers and 5799 students; Isa Kaita College of Education, Dutsinma (IKCOE) 211 lecturers and 5067 students; Hassan Usman Katsina Polytechnic, Katsina (HUKPOLY) 272 lecturers and 6844 students; and Yusuf Bala Usman Legal and General Studies, Daura (YBU- CLGS) 198 lecturers and 2758

students. The distribution of the Tertiary Institutions is presented in table 3.1 below thus:

Table 3.1: Distribution of State Tertiary Institutions in Katsina State

SNO	Name of Institution	Male Lecturers	Female Lecturers	Total No. of Lecturers	Male Students	Female Students	Total No. of Students
1	Umar Musa Yar'adua University (UMYU)	424	28	452	4398	1401	5799
2	Isa Kaita College of Education, Dutsinma (IKCOE)	200	11	211	4168	899	5067
3	Hassan Usman Katsina Polytechnic, Katsina (HUKPOLY)	241	31	272	5912	932	6844
4	Yusuf Bala Usman College of legal and General Studies, Daura (YBU-CLGS)	189	9	198	2360	398	2758
	Subtotal	**1,054**	**79**	**1,133**	**6,838**	**3,630**	**20,468**

Sources: Field Study, 2013

3.4 Samples and Sampling Technique

Out of the population, two institutions were selected as the sample for the study through the simple random sampling technique thus: Out of the 452 lecturers and 5799 students from UMYU, 210 and 361 would be selected respectively as the sample for the study. And for the IKCOE which has 211 lecturers and 5067 students, 140 and 361 samples would also be used, respectively. The sample technique to be used in this research work is simple random sampling technique. The lists of whole tertiary institution were written, folded and dropped inside a cup. The cup was shaken and 2 folds were randomly picked and UMYU and IKCOE emerged.

Table 3.2: Distribution of Samples from the Population of Tertiary Institutions in Katsina State

S/NO	Name of Institutions	Sample Frame of Lecturers	Sample Size	Sample Frame of Students	Sample Size
1	Umar Musa Yar'adua University (UMYU)	452	210	5799	361
2	Isa Kaita College of Education (IKCOE)	211	140	5067	361
	Subtotal	**663**	**350**	**10,866**	**722**

Sources: Field Study, 2013

3.5 Instrumentation

The instrument used in collecting data for the study is a questionnaire titled "Questionnaire for the Assessment of Use of Information and Communications Technology in Tertiary Institutions, Katsina State (QAUICT) designed by the researcher.'' The questionnaire was designed in such a way that lecturers have their own pattern and students theirs as well which they are to respond. And among the reasons why the questionnaire tool is selected than others is because of economy, uniformity of questions and standardisation.

Expense and time involved in training interviewers and sending them to interview are reduced. Then, each respondent receives the same set of questions phrased in exactly the same way. Questions may, therefore, yield data more comparable than information obtained through an interview. If the questions are highly structured and the conditions under which they are answered are controlled, then the questions could become standardised. Each questionnaire contain five sections A to E. Section A is demographic, it elicit among other things information on the personal data relating to

the schools such as the name of the school, its location, the lecturers' and the students' sex. Section B to E consists of 40 structured questions with each section carrying 10 questions.

The respondents replied based on the options provided in the questionnaire such as that proposed and used according to Likert scale procedure. Likert scale required respondents to answer or tick what he/she feels are correct like agree, strongly agree, disagree or strongly disagree or other statement similar to the aforementioned style et cetra.

3.5.1 Validity of the Instrument

After the construction of the questionnaire instrument, the initial draft was shown to validation panel which comprises of the research supervisors and other experts in instructional technology who checked, corrected and ascertained its face and content validity. The panel removed some items from section A which is the bio-data section and reduce the number of items to forty because they feel they are not related to the research of the study. All other corrections observed were done.

3.5.2 Pilot Testing

Pilot testing was carried out after the proposed instrument had been modified. The instrument was administered to 20 students of Katsina University, Katsina (now Alqalam University, Katsina) who were in their final year of study in 2013/2014 session programme; the responses were later retrieved and safely stored before actual analysis. Also, the sums of 20 lecturers were given a questionnaire and the responses collected back, from same institution. All the respondents were not part of the sample of the study but were used because they have similar characteristics of where the study would take place.

3.5.3 Reliability of the Instrument

The reliability of the instrument was analysed using the Kuder-Richardson-20 in order to check the internal consistency of the instrument for each of the two. The reliability co-efficient of the instrument responded by lecturers through the KR-20 yielded an r = 0.73 and this is an indication of high reliability. And for the students questionnaire, an r = 0.85 value was yielded, it is also a high reliability. Fulekar (2009) noted that an instrument is said to reliable when the reliability coefficient can be approximated to one. Therefore these instruments can be said to be satisfactory for use in the research study.

The reliability co-efficient was calculated using the formula KR-20

3.6 Procedure for Data Collection

The sample size of the population selected for the study were administered a questionnaire with a title ‘‘Questionnaire for the Assessment of the Use of Information and Communications Technology in Tertiary Institutions in Katsina State (QAUICT).’’ This was done with the permission of the department (Department of Educational Foundation and Curriculum) which issued an introduction letter to the researcher describing his status and where he come from for subsequent delivery to the institutions where the research was conducted. After the researcher obtained consent of the school, he later solicited for the help of a research assistants. After initial introduction and briefing in respect of the purpose and nature of the research instrument, the research assistants were required to administer the instruments to the respondents as well as ascertain that they (responses) were duly returned by the respondents. Some of the research assistants are Master’s degree students and Bachelors degree holders. The instruments were administered within a period of two weeks.

In order to enhance optimum data collection, a sizeable copies which are a little bit higher than the sample size was used in order to escape from poor response which might affect the analysis. A number of 400 copies for each lecturer from the sampled institutions and 800 copies for the lecturers were administered. The administration was done on 5 December, 2013, in the morning when much number of students were around the school for lectures. The sample is in tune with the specifications of the sample size rules as indicated in Appendix III.

3.7 Procedure for Data Analysis

In presenting the findings of this study, the data collected from the respondents were collated and analyzed using Likert Scaling system and the simple percentage which were used to answer the research questions of the study. These could be simple and clear methods of data analysis devoid of unnecessary ambiguity. The questionnaire was scored appropriately. Likert scale here was classified in four areas where in the first group a respondent is required to choose from the alternatives of Provided in Large Extent/Provided in Moderate Extent or Not Provided in any Extent. While in the second group the respondents is required to choose from Offered/Fairly Offered or Not Offered. In the third group it should be Accessible/Fairly Accessible or Not Accessible. And lastly in the fourth group it is to be Beneficent/Fairly Beneficent or Not Beneficent.

When an item is therefore selected, a code number is usually assigned to it and it is what the researcher would calculate and arrived at a decision. See Appendix II for the detailed presentation of the result.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter deals essentially with data presentation and analysis of findings based on the data generated from the questionnaires administered in the sampled Tertiary Institutions - Umar Musa Yar'adua University, Katsina (UMYU) and Isa Kaita College of Education (IKCOE) Dutsinma. The tool used was pilot-tested in Katsina University, Katsina (renamed in 2014 as Alqalam University, Katsina) in December, 2013.

The questionnaires were administered randomly to the lecturers and students that formed the samples for the study. Umar Musa Yar'adua University has 210 lecturers and 361 students, whereas Isa Kaita College of Education has 140 lecturers and 361 students. In sum, a total of 350 lecturers and 722 students were used as the sample for the study. These numbers were arrived at when excess copies of 400 and 800, students and lecturers respectively, were distributed in order to avoid the problem of poor response by the targeted respondents. When the required numbers were randomly picked the remaining copies were consequently discarded. This has enabled the researcher to have a response that matched with the defined sample.

The data obtained from the questionnaires were tabulated and analysed in a likert scale pattern before using Simple Percentage. The lecturers' and students' responses from Umar Musa Yar'adua University were first discussed before that of Isa Kaita College of Education. The tables that followed in the discussion of the results were numbered in alphabets 'a' and 'b' with UMYU Lecturers and Students represented by 'a', whereas IKCOE lecturers and students are represented by 'b'.

4.2 Analysed Responses from UMYU

For simplicity and clarity of understanding which is effective in answering the questions that would follow in the questionnaire, a key is provided that will guide the respondent thus. All tables were as a result of analyses conducted on the questionnaire which sought to answer the research questions.

PLE= Provided in Large Extent

PME= Provided in Moderate Extent

NPE= Not Provided in any Extent

OF= Offered

FOF= Fairly Offered

NOF= Not Offered

AC= Accessible

FAC= Fairly Accessible

NAC= Not Accessible

BN= Beneficent

FBN= Fairly Beneficent

NBN= Not Beneficent

4.2.1 Lecturers and Students Responses from UMYU

The following data were generated from section 'A' of the questionnaire that sought for the personal information of respondents.

Table 4.1a: Sex Distribution of Lecturers

Sex	Responses	Percentage
Male	188	89.52%
Female	22	10.48%
Total	**210**	**100%**

Table 4.1a indicated that the highest number of the respondents were male 188 (89.52%) which represents a large percent of dominance above the female colleagues which is 22 (10.48%).

Table 4.1b: Sex Distribution of UMYU Students

Sex	Responses	Percentage
Male	263	72.85%
Female	98	27.15%
Total	**361**	**100%**

Table 4.1b clearly shows that the highest number of the respondents in UMYU institution are male 263 (72.85%) which represents a greater number of dominance above their female colleagues who have 98 (27.15%) responses.

Table 4.2a: Qualification Distribution of Lecturers

Qualification	Responses	Percentage
NCE	-	-
Bachelors Degree	15	7.14%
Masters Degree	190	90.48%
PhD	5	2.38%
Total	**210**	**100%**

Table 4.2a clearly point that majority of the lecturers possess qualifications that are minimum for a lecturing profession in a university, Masters (90.48%), as such the school has the required standard to operate, and some are in pursuit of PhD Certificates in various institutions across the country and beyond. This will enable the schools to compete with other institutions across the globe. And for the students, the anticipated qualification is a Bachelors Degree.

Research Question 1: To which extent are Tertiary Institutions provided with ICT resources in Katsina State?

Table 4.3a: Items on ICT resources provided in Tertiary Institutions in Katsina State

Items	Types of ICT resources Provided in Tertiary Institutions in Katsina State	Provided in Large Extent	Provided in Moderate Extent	Not Provided in any Extent	% of Response	Decision
1	Internet-Connected Desktop Computers	158	52	0	75.24%	PLE
2	Internet-Connected Laptop Computers	137	73	0	65.24%	PLE
3	Multimedia Classrooms(Audio-Visual Centre)	10	53	147	70.00%	NPE
4	Examination Scoring Machine	10	32	168	80.00%	NPE
5	Institutional Cybercafés	63	105	42	50.00%	PME
6	Smart Board	31	74	105	50.00%	NPE
7	Screen Readers	0	52	158	75.24%	NPE
8	Data Projector	52	126	32	60.00%	PME
9	Digital Camera	21	84	105	50.00%	NPE
10	Television/Radio	32	84	94	44.76%	NPE

Table 4.3a shows that items 1 and 2 (75.24% and 65.24%) are provided in a Large Extent in some Tertiary Institutions, while items 5 and 8 (50.00% and 60.00%) were provided in Moderate Extent. And, items 3, 4, 6, 7, 9 and 10 (70.00%, 80.00%, 50.00%, 75.24%, 50.00% and 44.76%) were not provided and represented as 'Not Provided in any Extent'. This mean that there is the need for the government or the school authorities to do more in providing schools with the needed ICT resources for academic activities. Where items are not provided individual and private groups should be engaged so that assistance could be rendered.

Research Question 2: Does Tertiary Institutions in Katsina State Offer ICT related Study Programme(s)?

Table 4.4a: Items on Assessment of Programmes of Study Offered by Tertiary Institutions in Katsina State

Items	Programmes of Study Offered by Tertiary Institutions in Katsina State	Offered	Fairly Offered	Not Offered	% of Response	Decision
11	Doctor of Philosophy	21	10	179	85.24%	NOF
12	Masters degree	63	95	52	45.24%	FOF
13	Bachelors degree	147	63	0	70.00%	OF
14	Higher National Diploma	84	74	52	40.00%	OF
15	National diploma	95	63	52	45.24%	OF
16	National Certificate of education	105	53	52	50.00%	OF
17	Ordinary diploma	63	84	63	40.00%	FOF
18	Internationally recognised Certificate like Cisco Certificate	11	84	115	54.76%	NOF
19	Professional Certificate on Application and Appreciation	21	126	63	60.00%	FOF
20	Other Certificates not mentioned	10	63	137	65.24%	NOF

Table 4.4a shows that items 13, 14, 15, and 16 (70.00%, 40.00%, 45.24%, 50.00%) respectively, are believed to be offered in some Tertiary Institutions in Katsina State. But items 12, 17 and 19 (45.24%, 40.00% and 60.00%) were Fairly Offered. The responses further indicated that items 11, 18 and 20 (85.24%, 54.76% and 65.24%) were not offered in Tertiary Institutions in the state. This showed that advanced degree programmes such as PhD and Masters Programmes need to be given additional attention because of the changes which education is undergoing in katsina state, this will enable graduates to further their study. Other certificates not mentioned were not

offered may be because they may not likely secure a job to the owner. Examples of these certificates are the ones offered in private institutions and secondary schools.

Research Question 3: What are the forms of ICT resources that Lecturers have accesses to for teaching in Tertiary Institutions in Katsina State? (response by lecturers of both the institutions)

Table 4.5a: Items on the Forms of ICT resources Lecturers Accesses in Tertiary Institutions in Katsina State

Items	Forms of ICT resources Lecturers Access in Tertiary Institutions in Katsina State	Accessible	Fairly Accessible	Not Accessible	% of Response	Decision
21	Computers	116	84	10	55.24%	AC
22	Screen Readers	11	42	157	77.76%	NAC
23	Digital camera	31	74	105	50.00%	NAC
24	Scanners	32	94	84	44.76%	FAC
25	Overhead Projector	32	126	52	60.00%	FAC
26	Radio	21	74	115	54.76%	NAC
27	Televisions	21	63	126	60.00%	NAC
28	Printers	53	115	42	54.76%	FAC
29	Photocopy Machine	11	105	94	50.00%	FAC
30	Microphones/Loudspeakers	63	42	105	50.00%	NAC

Table 4.5a indicates that item 21(55.24%) is adequately accessible whereas items 24, 25, 28 and 29 (44.76%, 60.00%, 54.76%, and 50.00%) were fairly accessible. The responses also pointed that items 22, 23, 26, 27, and 30 were not accessible. There are still a lot of efforts that need to be done in the area of provision of more ICTs materials this will give lecturers opportunity to grasp the advantages that each material carry.

Research Question 4: What are the forms of ICT resources that students have accesses to for learning in Tertiary Institutions in Katsina State? (Responses by students of both the institutions)

Table 4.6a: Items on the Forms of ICT resources Students Accesses in Tertiary Institutions in Katsina State

Items	Forms of ICT resources Students Access in Tertiary Institutions in Katsina State	Accessible	Fairly Accessible	Not Accessible	% of Response	Decision
31	Computers	198	129	34	54.85%	AC
32	Screen Readers	0	0	361	100.00%	NAC
33	Digital camera	67	130	164	45.43%	NAC
34	Scanners	80	160	121	44.32%	FAC
35	Overhead Projector	67	164	130	45.43%	FAC
36	Radio	41	39	281	77.84%	NAC
37	Televisions	56	50	255	70.64%	NAC
38	Printers	154	120	87	42.66%	AC
39	Photocopy Machine	20	175	166	48.48%	FAC
40	Microphones/Loudspeakers	80	133	148	41.00%	NAC

Table 4.6a clearly showed that the respondents are of the opinion that items 31 and 38 (54.85% and42.66%) are accessible but items 34, 35 and 39 (44.32%, 45.43%, and 48.48%) are Fairly Accessible. More so, items 32, 33, 36, 37 and 40 (100.00%, 45.43%, 77.84%, 70.64%, and 41.00%) were not accessible. The students accept that there are no certain ICT resources in their institutions.

Research question 5: What are the Lecturers' Perceptions on the Benefits of ICT resources in Tertiary Institutions in Katsina State?

Table 4.7a: Items on Assessment of Lecturers' Perceptions of Benefits of ICT resources in Tertiary Institutions in Katsina State

Items	Benefits of ICT resources by Lecturers in Tertiary Institutions in Katsina State	Beneficent	Fairly Beneficent	Not Beneficent	% of Response	Decision
41	ICT helps in making teaching more interesting and less boring.	115	42	53	54.76%	BN
42	ICT help in providing distance learning programmes.	105	74	31	50.00%	BN
43	ICT enhances the quality of general work of lecturers.	84	105	21	50.00%	FBN
44	ICT help in checking examination malpractice.	21	63	126	60.00%	NBN
45	ICT makes lecturers to be up-to-date in their fields.	21	105	84	50.00%	FBN
46	ICT enhances efficiency of work.	126	53	31	60.00%	BN
47	ICT improve quality of teaching.	105	73	32	50.00%	BN
48	ICT enhances the management of financial records.	21	189	0	90.00%	NBN
49	ICT helps in reducing lecturers' workload.	31	74	105	50.00%	NBN
50	ICT help lecturers in acquiring new and less physically available instructional books/materials.	31	32	147	70.00%	NBN

Table 4.7a indicates that the respondents agreed item 41, 42, 46 and 47 (54.76%, 50.00%, 50.00%, 60.00% and 50.00%) are among the most important benefits the respondents enjoy in using ICT. And items 43 and 45 (50.00% and 50.00%) were considered to be Fairly Beneficent. Also, items 44, 48, 49 and 50 (60.00%, 90.00%, 50.00% and 70.00%) were not beneficent in the view of the respondents. Item 34 may not be understood well by many respondents but the fact is that ICT could be very effective in checking and controlling examination malpractice right from registration to the result preparation. We have CCTV cameras which could strategically place in examination halls; finger prints identification programme would help to check

impersonation and use of computer base examination where by students will do his tests by and in computer. Another technique of examination is called Automated Integrated examination System (AIES). Item 38 was about keeping records in schools. Actually the best way of keeping records today is through the use of ICT. We keep students registration lists, payment details, school accounts, meeting extracts, promotions, transfers and so on. And where item 39 the respondents believed that ICT is not beneficent in reducing lecturers' workload I wish to assert that, in my opinion it is not true. There are various tasks which lecturer does in relation to academic activities like paper making, result compilation and submission. Other tasks include seminar paper presentation, departmental meetings and so on. With ICT these and others could be achieved easily. In discussing item 40 which is about the use of ICT in acquiring new and less physically available instructional books/materials. Yes of course many vital textbooks are not readily available physically but could be purchased or freely accessed in the internet. This has enabled a large number of people including lecturers to own their own materials.

Research question 6: What are the students' perceptions on the Benefits of ICT resources in Tertiary Institutions in Katsina State?

Table 4.8a: Items on Assessment of students' perceptions of benefits of ICT resources in Tertiary Institutions in Katsina State

Items	Benefits of use of ICT resources by Students in Tertiary Institutions in Katsina State	Beneficent	Fairly Beneficent	Not Beneficent	% of Response	Decision
51	ICT help in making learning more interesting and less boring	160	118	83	44.32%	BN
52	ICT assist in providing distance learning programmes	283	124	54	78.39%	BN
53	ICT enhances the quality of general study of learners	189	125	54	52.35%	BN
54	ICT help in checking examination malpractice	40	79	242	67.04%	NBN
55	ICT makes learners to be up-to-date in their fields of study	38	184	139	50.97%	FBN
56	ICT enhances efficiency of both teaching and learning	230	81	50	63.71%	BN
57	ICT improve quality of learning	206	53	102	57.06%	BN
58	ICT enhances social interactions among students e.g., facebook	200	100	61	55.40%	BN
59	ICT helps students to be research oriented	65	186	110	51.52%	FBN
60	ICT help students in acquiring new and less physically available instructional books/materials online	169	121	71	46.81%	BN

Table 4.8a indicates that items 51, 52, 53, 56, 57, 58 and 60 (44.32%, 78.39%, 52.35%, 63.71%, 57.06%, 55.40%, 46.81%) are beneficent from using ICTs. While items 55 and 59 (50.97%, 51.52%) were chose to be Fairly Beneficent. Also, item 54 (67.04%) was not beneficent in the view of the respondents.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECCOMENDATIONS

5.1 Summary

Therefore, the research which was basically about the Assessment of the Use of Information and Communications Technology in Tertiary Institutions in Katsina State, Nigeria was analysed thoroughly and the following findings were discovered thus.In the preliminary section of the research study, chapter one has dealt with the introduction after discussing about the background of what the research, including the objectives, to be achieved. Based on the stated objectives, six research questions were raised in order to guide the researcher in getting answers to certain issues. The significance as well as the scope of the research work were discussed and presented. The research study hoped to benefit the government, society, the school, lecturers and the students as well.

The research has encountered certain limitations which include inadequate information or knowledge of the concept of ICT, most pressingly by the student respondents. These character and attitude has resulted in poor response which is often accompanied with vague answers. The researcher had to take lengthy time in some way to explain, interpret and elucidate more on some aspects of the tools to the respondents.

In chapter two, concepts which are related to the study were discussed which include introduction part of the chapter and the conceptual framework. Others were the concepts of instructional technology, objectives of instructional technology, educational technology, differences between instructional technology and educational technology, information and communications technology and the challenges and prospects of ICT usage in Nigerian tertiary institutions. Additional concepts such as ICT in enhancing teaching and learning process, tertiary institution, and the roles of ICT in education and tertiary administration; empirical study was also briefly discussed. All these and other

related concepts were presented in the work in order to enhance quick and faster understanding of the research work.

Chapter three had highlighted the introduction of the chapter and the design adopted in the study, the design used was a descriptive survey. Other areas for discussion include the population of the study which comprise of 1,133 lecturers and 20,468 students; sample and sampling technique in the study as well as the instrumentation, validity, pilot testing, reliability of the instrument, procedure for data collection and data analysis were expatiated. The samples include two Tertiary Institutions with a population of 350 lecturers and 722 students.

Chapter four discussed about data presentation and analysis, based on the findings, it was found that Government has provided tertiary institutions in some ways internet connected desktop and laptop computers which are used for both academic and non-academic activities. Other ICT resources provided include Institutional Cyber café, Projectors, Photocopy Machines, Scanner and Printing Machines. Many important ICT resources are not available such as the Screen Readers, Loudspeakers, Digital Cameras, Multimedia Rooms, Radio and Televisions.

On the programmes of study offered in relation to ICT resources in Tertiary Institutions, it was discovered that PhD Programme is not offered but Masters Programmes are Fairly Offered in one of the institutions in the state. Whereas Bachelors' degree, Higher National Diploma, National Diploma, National Certificate of Education and Professional Certificate on Computer Application and Appreciation are Offered in Tertiary Institutions in Katsina State. International certificate programmes like Cisco are not offered.

On the forms of ICT resources which lecturers and students accesses for academic purposes, social interactions and so on, the research discovered that

computers are strongly accessible followed by Photocopy Machine, Printers, Scanners, and Projectors. Also in discussing the benefits that are inherent in the use of ICT by both lecturers and students, the research discovered that numerous benefits could be gained when ICT resources adequately used. Among the benefits that the respondents suggested were in the field of making teaching more interesting and less boring, in providing distance learning programmes and in the enhancement of the quality of general work of lecturers. Others were making learning more interesting and less boring, in keeping school records and in enhancing the quality of general study of learners. Also, ICT has helped lecturers and students in accessing and in some other case enabling them to acquire materials that might not be available except online. In fact, the research has found that ICT is an important tool for shaping the future of our educational system.

5.2 Conclusion

Therefore, the research wish to concluded that although some ICT resources were provided in Tertiary Institutions in Katsina State such as computers and internet resources, Printers, Scanners and Photocopy Machine, others were not available, example is the screen reader, which would take care of learners with special abilities and needs (blinds people, etc). The research has drawn the attention of lecturers and students on the benefits of ICT in education and beyond. It has been vindicated that ICT has impacted on the quality and quantity of teaching, learning, and research in traditional and distance education institutions, (Yusuf, 2005). In concrete terms, ICT is a means to enhancing academic and non academic activities through its dynamic, interactive, and engaging content; and it could provide real opportunities for individualised instruction.

The research also wish to conclude that Information and Communications Technology had possess the potentiality to accelerate, enrich, and deepen skills; motivate and engage students in learning; helps to relate school experiences to work practices; contributes to radical changes in school; strengthens teaching, and provides opportunities for connection between the institution and the world. Also, Information and Communications Technology could make the school more efficient and productive, thereby engendering a variety of tools to enhance and facilitate teachers' professional activities.

Also ICT has contributed to effective learning through expanding access, promoting efficiency and improving the quality of learning and improving management systems. According to Obeng (as cited in Agbetuyi and Oluwatayo, 2002), ICT is now regarded as a utility such as water and electricity and hence has become a major role in education, learning and research in general, agriculture, and health and even in poverty alleviation by generating or creating new jobs and investment opportunities.

Apart from the benefits related to ICT, many obstacles and problems were related to its success in Katsina State Tertiary Institutions. Among the hitches are power insufficiencies, lack of qualified personnel who will teach or instruct learners, poor connectivity and available network reception which cause poor access to internet utilisation and so forth. The research could not be completed without presenting necessary recommendations which could serve as an indicator towards reshaping the use of ICT in Katsina State.

Therefore it is hoped that the research has answered the salient questions designed earlier which have given focus to what the research intended to achieve. Among the questions raised were to: what extent are tertiary Institutions provided with ICT resources in Katsina State? Does Tertiary Institutions in Katsina State offer ICT

related study programme(s)? What are the ICT resources lecturers have access to for teaching in Tertiary Institutions in Katsina State? What are the ICT resources students have access to for learning in Tertiary Institutions in Katsina State? What are the lecturers' perceptions on the benefits of ICT in Tertiary Institutions in Katsina State? What are the students' perceptions on the benefits of ICT in Tertiary Institutions in Katsina State?

5.3 Recommendations

The researcher recommends that there is need for a well articulated, needs assessment to be carried out to determine priority areas for ICT intervention in education in Katsina State. The State Government should put in place explicit policy guidelines for the use of ICT in Tertiary Institutions. Provisions for the implementation of these policies should be made and monitored to ensure compliance. Training of lecturers should be given priority attention and should include basic computer literacy, email, search engines, website design, and the integration of technology into the classroom. The training should be either in-service or pre-service. Seminars and workshops should form a major method of in service training. The upspring of Tertiary Institutions in the state warrants the need to employ more lecturers who are ICT specialists and those who have low education qualification be sponsored in and outside the country to go further and acquire more knowledge. This will help in addressing the problem of inadequacy of ICT experts.

Tertiary Institutions should establish linkages with funding agencies such as; World Bank's Link for Development (WorLD), the International Development Research Centre (IDRC), the International Education and Resource Network (IEARN) and the Department for International Development (DFID), Schools Online, and the Swedish International Development Cooperation Agency (SIDA). The government

should ensure adequate funding of ICT. This should include capital and recurrent funds for provision and maintenance of ICT resources such as hardware and software, installation, expansion of existing resources, telecommunication, and phone lines, pre-service and in-service training of educational administrators and technical support staff.

Also, a campaign programme should be flag up with the aim of equipping all the students and lecturers of Tertiary Institutions with computer and other various types of ICT resources. This can be achieved by providing them with personal computers at a cheaper rate or through free interest loan payable in a longer time, and ensuring adequate maintenance of already established ICT and computer centres in respective schools/institutions. A department could be opened in the ministry of education which will be saddled with responsibility of supply, installation, monitoring and supervision of ICT and computer resources in the State. This will no doubt boost long life and sustainability of resources in institutions. And, if the government intends to achieve more on ICT and computer literacy, O'levels education should also be given consideration so that those students that will enter A' levels are already not new to ICT or computer resources and operations.

Programmes of study that are ICT related should be introduced and be given priority, into our institutions so that students who wish to specialise in one ICT area could do so without necessarily going far away. This will undoubtedly make our institutions to be ICT base higher institutions in the whole country and government may stand the chance of controlling the problem graduate unemployment as many would be self employed.

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APPENDEX I

Introduction Letter

Department of Educational Foundation and Curriculum,
Ahmadu Bello University,
Zaria.
17th June, 2014

Sir,

The researcher is a final year student of the Department of Education Foundations and Curriculum, Ahmadu Bello University, Zaria and is carrying out a research on ‘‘Assessment of the Use of Information and Communications Technology in Tertiary Institutions in Katsina State, Nigeria.’’ The research is in partial fulfilment of the requirements for the award of Masters of Education (M.ED) Degree in Instructional Technology. The information required is strictly for academic purpose and shall be treated with utmost confidentiality.

Yours sincerely,

Umar Muhammad AHMAD
(MED/EDUC/04861/2010-2011)

TITLE

''QUESTIONNAIRE FOR THE ASSESSMENT OF THE USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY (QAUICT) IN TERTIARY INSTITUTIONS IN KATSINA STATE, NIGERIA''

SECTION A
Bio-Data of the Respondent

1. Sex of the Respondent. Male [ ] Female [ ]

2. Status of the Respondent. Lecturer [ ] Student [ ]

3. Name of Institution where the Lecturer teaches.

A. University
B. College of Education
C. Polytechnic
D. None of the Above

4. Highest Qualification obtained? A. Doctor of Philosophy B. Masters Degree [ ] C. Bachelors Degree/Higher National Diploma [ ] D. NCE/ND

SECTION B

Items on Types of ICT resources Provided in Tertiary Institutions in Katsina State

Key:
Provided in Large Extent (PLE)
Provided in Moderate Extent (PME)
Not Provided in any Extent (NPE)

SNO	Types of ICT resources Provided in Tertiary Institutions for Teaching in Katsina State	PLE	PME	NPE
1	Internet Connected Desktop Computers			
2	Internet Connected Laptop Computers			
3	Multimedia Classrooms(Audio-Visual Centre)			
4	Examination Scoring Machine			
5	Institutional Cybercafés			
6	Smart Board			
7	Screen Readers			
8	Projector			
9	Digital Camera			
10	Television/Radio			

SECTION C

Items on Assessment of Available Programmes of Study Offered by Tertiary Institutions in Katsina State

Key:
Offered (OF)
Fairly Offered (FOF)
Not Offered (NOF)

SNO	Types of Programmes Offered by Tertiary Institutions in Katsina State	OF	FOF	NOF
11	Doctor of Philosophy			
12	Masters degree			
13	Bachelors degree			
14	Higher National Diploma			
15	National diploma			
16	National certificate of education			
17	Ordinary diploma			
18	Internationally recognised certificate like Cisco certificate			
19	Professional Certificate on Application and Appreciation			
20	Other Certificates not mentioned			

SECTION D

Items on the Forms of ICT resources Lecturers Accesses in Tertiary Institutions in Katsina State

Key:
Accessible (AC)
Fairly Accessible (FAC)
Not Accessible (NAC)

SNO	Forms of ICT resources Lecturers and Students accesses in Tertiary Institutions in Katsina State	AC	FAC	NAC
21	Computers			
22	Screen Readers			
23	Digital camera			
24	Scanners			
25	Overhead Data Projector			
26	Radio			
27	Televisions			
28	Printers			
29	Photocopy Machine			
30	Microphones/Loudspeakers			

SECTION E

Items on the Forms of ICT resources Students Accesses in Tertiary Institutions in Katsina State

Key:
Accessible (AC)
Fairly Accessible (FAC)
Not Accessible (NAC)

SNO	Forms of ICT resources Students Accesses in Tertiary Institutions in Katsina State	AC	FAC	NAC
31	Computers			
32	Screen Readers			
33	Digital camera			
34	Scanners			
35	Overhead Data Projector			
36	Radio			
37	Televisions			
38	Printers			
39	Photocopy Machine			
40	Microphones/Loudspeakers			

SECTION F

Items on Assessment of Lecturers' Perceptions on the Benefits ICT resources in Tertiary Institutions in Katsina State

Key:
Beneficent (BN)
Fairly Beneficent (FBN)
Not Beneficent (NBN)

SNO	Benefits of ICT resources to Lecturers in Tertiary Institutions in Katsina State	BN	FBN	NBN
41	ICT help in making teaching more interesting and less boring			
42	ICT help in providing distance learning programmes			
43	ICT enhances the quality of general work of lecturers			
44	ICT help in checking examination malpractice			
45	ICT makes lecturers to be up-to-date in their fields			
46	It enhances efficiency of work			
47	ICT improve quality of teaching			
48	It enhance the management of financial records			
49	ICT helps in reducing lecturers workload			
50	ICT help lecturers in getting and possessing new and less physically available instructional books/materials			

SECTION G

Items on Assessment of Student's' Perceptions of Benefits of Using ICT resources in learning in Tertiary Institutions in Katsina State

Key:
Beneficent (BN)
Fairly Beneficent (FBN)
Not Beneficent (NBN)

SNO	Benefits of Using ICT resources by students for learning in Tertiary Institutions in Katsina State	B	FB	NB
51	ICT help in making learning more interesting and less boring			
52	ICT help in providing distance learning programmes			
53	ICT enhances the quality of general study of learners			
54	ICT help in checking examination malpractice			
55	ICT makes learners to be up-to-date in their fields of study			
56	It enhances efficiency of both teaching and learning			
57	ICT improve quality of learning			
58	ICT enhances social interactions among students e.g., facebook			
59	ICT helps students to be research oriented			
60	ICT help students in getting and possessing new and less physically available instructional books/materials online			

APPENDIX II

Table for Determining Sample Size Research Activities

This table was collected from the research of Robert V. Krejcie and Daryle W. Morgan (1970:607-610)

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	364
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note- N is population size
S- Is sample