BASIC TECHNOLOGY TEACHERS' PERCEPTION ON THE AVAILABILITY AND UTILIZATION OF INFORMATION AND COMMUNICATION TECHNOLOGY FOR TEACHING IN SECONDARY SCHOOLS IN KWARA STATE.

BY

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DECLARATION

I declare that the work in this thesis entitled "Basic Technology Teachers' Perception on the Availability and Utilization of Information and Communication Technology for Teaching in Secondary Schools in Kwara State" has been carried out by me in the Department of Educational Foundations and Curriculum. 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 presented for another degree or diploma at this or any other institution.

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Name of Student	Signature	Date

CERTIFICATION

This thesis entitled "Basic Technology Teachers' Perception on the Availability and Utilization of Information and Communication Technology for Teaching in Secondary Schools in Kwara State" by Samsondeen Abiodun Adepoju meets the regulations governing the award of the degree of Masters of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This thesis is dedicated to my late father, Alhaji AbdulWahab Adepoju Adio, who inspired me greatly.

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ABSTRACT

This study examined basic technology teachers' perception on the availability and utilization of Information and Communication Technology for teaching in secondary schools in Kwara State. The study used cross-sectional survey design and simple random sampling was used to select the sample. Fifty six junior secondary schools with a total population of 376 and a sample size of 112 Basic Technology teachers with a total population of 445 were sampled for the study. Questionnaire was the instrument used for data collection in the study. Five research questions and two research hypotheses were answered and tested respectively. T-test and ANOVA tools were used for the statistical analysis. The result shows that ICTs are not available for delivery of instructions, thereby leading to irregular utilization for instructional process or self development. The finding shows most basic technology teachers are not competent in ICT utilization but are confident that it has great benefits despite several constraints encountered in its utilization. The result also shows no significant difference between public and private schools and no significant difference among the three senatorial districts in the utilization of ICT for instructional delivery in Kwara State. It is recommended that; teachers should endeavour to develop skills in the utilization of ICT for effective delivery of instruction. Parents should support the utilization of ICT resources in instructional delivery in their schools. Schools and government should make funds available and sponsor Basic Technology teachers' attendance at conferences, seminars and workshops on utilization of ICT for effective integration of ICT.

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LIST OF ABBREVIATIONS

AECT: Association for Educational Communication and Technology

ANOVA: Analysis of Variance.

ISTE: International Society for Technology Education

PBLC: Problem Based Learning Cycle

TRCN: Teachers' Registration Council of Nigeria

Operational Definition of Term

Information and Communication Technology: this refers to range of technological tools and techniques which basic technology teacher integration into teaching.

Perception: This refers to the teachers' sense of judgment and opinion as regards teaching.

Availability: This refers to the ability of a teacher to access information or resources in school and in the correct format so as to use it for teaching or learning.

Utilization: This refers to ability of a teacher to achieve instructional objectives through ICT tools .

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

As a new paradigm emerges, each paradigm shift has brought a set of all pervasive principles that becomes the new common sense basis for organizing every activity and for structuring any organization- be it government, business, entertainment or education. While developed countries are engaged in the shift from mass production to information technology paradigm, the economies of many less developed countries are pre industrial and based on agriculture (United Nations Education and Scientific Cultural Organization, 2011). Africa being a continent with lots of developing nations and large dependence on her human or natural resources (Marcellius, 2009), should wakeup to the fact that its human and natural resources are being eroded by the introduction of the new technologies. Nigeria as a nation therefore, needs to device new and profitable adjustment mechanism for integrating into the global system as was the case in the colonial period (Iheriohanma, 2011). The Economic Commission for Africa has also indicated that in a rapidly changing world, the ability to access and utilize information should not be seen as a luxury but a necessity for development (Adomi & Kpagban, 2010).

Having outlined its new economic strategies to become one of the world largest economies by the year 2020 as stated in the first national vision 20:2020 medium term implementation plan document (NV 20:20, 2009), Nigeria need not to lose sight of the importance of moving to the knowledge development and innovation

stage in the future, and may start doing so in certain sectors of the economy (World bank, 2010). The field of education has been affected by Information and Communication Technologies which have undoubtedly affected teaching, learning and research (Yusuf, 2005). Therefore, a better education system will also allow Nigerian youth to take advantage of economic opportunities and also become active players in their own economy and reduce the rate of unemployment in the country (World Bank, 2010).

Many nations of the world had transformed their education systems and training by ICT, therefore these reforms can also make instruction delivery in Nigerian secondary schools much more interesting and relevant to meet not only the needs of the society, but also the outside world as well (Ajelabi & Agbatogun, 2010). According to Adomi & Kpangban (2010), NEPAD e-School initiative stated that the typical African School Environment provides neither opportunity nor training in using ICTs and that seventy five percent of responding teachers had little or no experience or expertise in the utilization of ICT for instructional delivery. Furthermore, efforts have been made to ensure that ICTs are available in Nigerian secondary schools, the uptake is still low as most secondary schools (public and private schools) do not offer ICT training programmes. New instructional techniques that use ICTs provide a different modality of instruments such as allowing access to tools that adjust attention span and provide feedback for literacy enhancement.

In enhancing the prominent roles of ICT in advancing knowledge and skills necessary for effective functioning in the modern world, the Nigerian Government -

during the President Goodluck Jonathan administration- set up a committee to harmonize the different IT sectors policies which the Minister for Communications and Technology -Omobola Johnson- headed. The committee in the year 2012 came up with the document titled the National ICT policy (FGN, 2012). Despite the great work done by the committee, a critical review of the policy shows that there is need for an explicit ICT policy for Education to leapfrog from the information darkness that erodes the system and also achieve the vision 20:2020 objectives.

Learning societies constantly change, giving room for dynamics in its educational system. Having recognized the role self employment can play in the high rate of unemployment, Nigeria is making serious efforts to establish and systematically improve the teaching of technical and vocational education and training. Basic technology as a subject is very important for the scientific and technological advancement of any nation as its usefulness cuts across all fields of human endeavor (Onasanya, Fakomogbon, Shehu & Soetan, 2010). According to Fafunwa (1984) as cited in Uwaifo (2011), he stressed that the sole aim of the subject is to develop in children the aptitude for things that are technical and not necessarily making them technicians. The preceding statement gives room for students to decide either to go to technical colleges or complete the senior secondary school on completion of the upper basic education. Uwaifo (2011), further stated that recent development laid emphasis on the need for review of traditional approaches and instructional delivery method as the bulk of knowledge and skills that technical teachers in Nigeria impart are foreign to the traditional environment due to constant

changes in the body of knowledge and developments in basic technology and societal needs.

Sarason (2004) as cited by McConnel (2007), expresses his frustration about the ambiguity that surrounds the word learning for educators. He opined that reducing the measurement of learning to simply a change of behaviour severely limits both the teacher and the learners as it is a complex and multi-dimensional process which is often difficult to capture, access and communicate to stakeholders. Learning can be said to be the link between being in the world and knowing about the world. Knowing about the world affects how we exist in the world and likewise affects how we think about it, which all involves learning process (McConnel, 2007).

Therefore, the kind and quality of training and development opportunities and culture in which a teacher works will influence their promotion of lifelong learning values and their ability to help students to learn to succeed (LaBoskey, 2006). The concept of teaching in this context is addressed as a profession which deals with construction and organization of a personal pedagogy through interaction with classroom culture and the wider culture, and also acting as a mediator of an innovation.

Kwara State which is the location of this study - has an economy based on subsistence farming, small scale manufacturing and government driven economic activity- is among the six poorest states in Nigeria. When it comes to educational quality, Kwara is generally performing no better and no worse than the Nigerian average, but this still means that its students are not acquiring sufficient academic

skills in School. Despite the fact that large majority of teachers in Kwara State are now qualified they do not have adequate knowledge among which low levels of numeracy and literacy skills, as well as inadequate knowledge in their chosen areas of subject specialization are common place (Gannicott, 2008). According to Teachers' Registration Council of Nigeria (2012), 43.74% are NCE holders, 45.49% have Bachelor degrees, 10.706% with Masters degrees and Ph.D with 0.056% in Kwara State.

Based on the aforementioned points, the researcher was of the view that there was need to examine basic technology teachers' perception on the availability and utilization of Information and Communication Technology for teaching in secondary schools in Kwara State.

1.2 Statement of the Problem

Despite the strength of the rapid spread of technology around the world in recent time, there is a decline in the academic performance in basic technology in the country. This poor performance has been recorded for some years by the examining bodies of Junior Secondary Certificate Examination (JSCE), school promotion examinations and the qualifying examinations conducted by the State Ministry of Education. This poor performance has been ascribed to non-availability of ICT resources and teachers' lack of the necessary digital competence to utilize ICT in instruction delivery (Onasanya, Fakomogbon, Shehu & Soetan, 2010).

It has also been recorded in the past according to Akpan, Usoro & Akpan (2010), that pupils acquire skills in basic technology which makes them fit into the society properly and the reverse is now the case as students' on completion of the course cannot carry out simple daily maintenance on technological appliances. Several complains have been attributed to this among which is schools' lack of organization of workshops for teachers on the utilization of ICT in instructional delivery of content, teachers' enrolling for professional development programmes in which their employers gave no approval resulting to low input as expected and parents' little or no effort to support or address the utilization of ICTs in instructions during Parents' Teachers' Association (PTA) meeting.

Hence, the essence of the study was to examine basic technology teachers' perception on the availability and utilization of Information and Communication Technology for teaching in secondary schools in Kwara State.

1.3 Objectives of the Study

The study examined basic technology teachers' perception on the availability and utilization of Information and Communication Technology for teaching in junior secondary schools in Kwara State. Specifically, the study aimed to:

i. Identify the available ICT resources for teaching basic technology in Kwara State junior secondary schools.

ii. Evaluate the level of competency of basic technology teachers of Kwara State in the utilization of ICTs for teaching.

iii. Determine the frequency of utilization of ICTs by Basic Technology teachers in Kwara State for teaching.

iv. Examine the perceived benefits of utilization of ICT for teaching by basic technology teachers in Kwara State.

v. Examine the constraints militating against effective utilization of ICT for teaching by basic technology teachers in Kwara State.

vi. Determine the difference between public and private basic technology teachers in junior secondary schools of Kwara State in the utilization of ICTs for teaching.

vii. Determine the difference among basic technology teachers of the three senatorial districts of Kwara State junior secondary schools in the utilization of ICTs for teaching.

1.4 Research Questions

The following research questions guided the study:

i. What type of ICTs are available for teaching of basic technology in junior secondary schools in Kwara State?

ii. What level of competence do basic technology teachers of junior secondary schools in Kwara State possess in the utilization of ICT for teaching?

iii. How frequent do Basic Technology teachers in junior secondary schools of Kwara Sate utilize ICT for teaching?

iv. What are the perceived benefits of ICT utilization in teaching by basic technology teachers in junior secondary school of Kwara State?

v. What are the constraints militating against effective utilization of ICT in teaching by basic technology teachers in Kwara State junior secondary schools?

vi. Is there any difference between public and private basic technology teachers in junior secondary schools of Kwara State in the utilization of ICTs for teaching?

vii. Does difference exist among basic technology teachers of the three senatorial districts of Kwara State junior secondary schools in the utilization of ICTs for teaching?

1.5 Hypotheses

The following null hypotheses were drawn to guide the study:

i. There is no significant difference between public and private basic technology teachers in junior secondary schools of Kwara State in the utilization of ICTs for instructional delivery.

ii. There is no significant difference among basic technology teachers of the three senatorial districts of Kwara State junior secondary schools in the utilization of ICTs for instructional delivery.

1.6 Scope of the Study

The research work was carried out in 45 public and private junior secondary schools in Kwara State. ICTs examined in the study were range of tools and techniques relating to computer based hardware (including computer system, laptops, printers, scanners and xeros machine), to generic tools (such as word processor,

database, spreadsheet and presentation software), to communications (including TV, radio, e-mail, internet, networks (wired and wireless), mobile phones, fax) and personal-professional activities on ICT integration in instructional delivery by basic technology teachers in junior secondary schools in Kwara State.

1.7 Significance of the Study

The research work will be significant and useful in teaching of basic technology. The findings will help basic technology teachers appreciate the value of ICT in instruction delivery and motivate them towards utilizing suitable ICT that will possibly reduce the failure in basic technology examinations. The curriculum developers will find it useful possibly when reviewing the basic technology curriculum thereby stressing the need for its development in order to leapfrog into the information age.

Furthermore, the study will be useful for researchers by forming a basis for further studies on ICT utilization in instructional delivery by basic technology teachers. Funding agencies of like interests, as well as professional bodies can support or formulate policies from recommendations made from the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents review of relevance to the study. The chapter was reviewed under the following subheadings:-

2.2 Conceptual Framework

2.2.1 Concept of ICT

2.2.2 Basic Technology as a Subject in Nigerian School Curriculum

2.3 Types and Terms of ICTs

2.4. ICT Competence- Skills and Knowledge

2.5 Application of ICT in Teaching

2.6 ICT for Education

2.6.1 Explicit ICT policy for Education

2.6.2 Model for Systemic Development of ICT for Education

2.6.3 Conditions for Proper Integration of ICT in Classroom

2.7 Problems Militating the utilization of ICT in Teaching

2.8 Empirical Studies

2.9 Summary

2.2 Conceptual Framework

2.2.1 Concept of ICT

Many of the momentous economic and social changes that have been experienced in the late twentieth and early twenty first centuries have been facilitated by the dramatic increase in the capabilities and availability of information and communications technologies (UNESCO, 2011). Towards the end of the last millennium, deep structural, technological and scientific developments were impacting business, education and the ways we live and learn. The last few years witnessed two parallel revolutions in the field of information technology -the first represents the explosion of information that is easily accessible while the other is electronic communications through which all types of information are transferred securely at very high speeds at local and international levels (Al-Natour, Alkhamra & Ajlouni, 2008).

Machlup (1983) as cited in Sholle (2000), noted that the original meaning of the word "information" derives from the Latin word ‘informare’, which means "to put into form." "Informing" therefore carries the sense of "imparting learning or instruction" or more generally conveys the sense "to tell (one) of something." Thus, "information" refers to the action of informing or to that which is told.

Adegbija (2009), explains in her work that there are many definitions of communication based of different disciplines. She further stressed that the term communication originated from a Latin word ‘communis’ which means creating and establishing ‘commonness between two people with the intent of effecting a change

in the recipients' attitude. Sambe (2008), sees communication as an instrument or a vehicle of social interaction and is the bedrock of modern society. A most critical component of modernity and civilization.

Etymologically, technology is derived from the Greek word 'teckne' which is an art or craft. Over time, technology has acquired meanings as a process and as a product. As a process, it involves applying resources to satisfy human wants and needs to extend human capabilities – systematic process of solving problems by scientific means. It is also refers to as a product in that it is perceived as hardware device that delivers information and serves to accomplish task – it implies the development of application of tools, machines and materials (Galbraith, 1967 in Egbowon, 2007).

UNESCO (2004) as cited by Al-Natour, et al. (2008), defined ICT as those aspects of scientific, technological and engineering knowledge, and administrative methods that are used to access and process information and its applications – the interaction between computers and tools with human beings and their social, economic and cultural matters. Tella, Tella, Toyobo, Adika & Adeyinka (2007), claimed that formerly the term IT was used to mean ICT and the term ICT was synonymous with computer, but as the passage of time covered other equipment created to enhance acquisition, storage and dissemination of information materials.

As ICT is becoming more pronounced to the extent that rarely is anything mentioned in any area of human endeavours without reference to this technology, Perez (2002) as cited by UNESCO (2011) provides an insightful summary and

contrast between the technological, economic and social paradigms associated with the mass production and the information technology paradigm as follows;

i. The primary distinction between the two paradigms is the shift from production of objects (mass production) to production of knowledge (Information Technology). They further stress that the hallmark of mass production is standardization while the hallmark of IT paradigm is personalization.

ii. Secondly, the mass production paradigm used ICTs of an earlier time – print, radio and television- to support the dissemination of information from centralized authorities and to foster the consumption of mass produced goods. In the IT paradigm, ICT served primarily a production function, as more people have access to the multimedia information processing capabilities of computers and are able to use them to create new knowledge.

Therefore, a good conclusion is that ICT can increase the economic and social well being of poor people, enhance the transparency of the public sector in the delivery of social services and empower individuals and communities to be part of global village (International Institute for Communication and Development, 2009).

2.2.2 Basic Technology as a Subject in the Nigerian Secondary School Curriculum

Technical and vocational education systems in Africa differ from country to country and are delivered at different levels in different types of institutions, including technical and vocational schools (both public and private), polytechnics, enterprises, and apprenticeship training centers. West Africa has a traditional apprenticeship which offers great opportunity for the acquisition of employable skills

in the informal sector. In general, students enter the vocational education track at the end of primary school which corresponds to 6 – 8 years of education as in countries like Burkina Faso and Kenya, or at the end of lower or junior secondary school, which corresponds to 9 – 12 years of what is called basic education in countries like Ghana, Nigeria, Mali and Swaziland. (African Economic Outlook, 2008 as cited by Adeoye & Olabiyi, 2011).

At the inception of 6. 3. 3. 4. system of education in Nigeria, technical and vocational education as offered as a subject at the end of primary school and was called "Introductory Technology" which is different from the current 9. 3. 4. system of education where it is called "Basic Technology" (Fakomogbon, Morakinyo, Omiola & Ibrahim, 2012). Basic technology is a subject that introduces students at the Junior Secondary schools in Nigeria to the basic rudiment of technology. The National Policy on Education (FRN, 2004) defined it as the aspect of education which leads to acquisition of practical and applied skills as well as basic scientific knowledge. It is also a subject that deals with the fundamentals of engineering and technology and its components include: Woodwork, Metalwork, Building Construction, Electrical/Electronics, Computer, Mechanics, Technical Drawing, and so on.

According to the Federal Ministry of Education (2004) in Fakomogbon, Morakinyo, Omiola & Ibrahim (2012), the following are the objectives of teaching Basic Technology subject in Nigerian junior secondary school schools:

i. To provide pre-vocational orientation for further training in technology.

ii. To provide basic technology literacy for everyday living and

iii. To stimulate creativity (Fakomogbon et al., 2012).

Therefore, to reduce ignorance about technology and lay a solid foundation for true national development; basic technology subject needs to be accorded a place in the school curriculum as a not only as a core subject like Mathematics and English language, but with consideration of recent technological developments.

2.3 Types and Terms of ICTs

Information and Communication Technologies are information handling tools used to produce, process, store, distribute and exchange information. According to Cengage Learning (2010), the following are examples of ICTs which provide an overview for teaching and interacting with learners of all ages:

i. **Desktops PCs**: These are microcomputers whose case or main housing sits on a desk, with keyboard in front and monitor often on top.

ii. **Tablet PCs** : A small screen (12") laptop PC in which data may be directly entered onto the screen with a special pen.

iii. **Notebook computers (laptop computers)**: A mobile computer that is operated with a battery away from power sources. Newer versions are now wireless and can connect to the Internet in wireless hotspots.

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iv. **Interactive Whiteboard:** A whiteboard surface that displays digital files from a computer via a data projector. May function as a standard whiteboard i.e., teacher or student may write on it and then digitise the marked up materia

v. **Personal Digital Assistants (PDAs)**: PDAs and PocketPCs allow input of data via a mini keyboard or equivalent, they usually include a calendar, organiser functions, basic software functions such as word processing, email, spreadsheets, data storage and wireless capacity.

vi. **Gaming Devices** : Consist of a gaming console (e.g. Gameboy) and games or a content delivery method.

vii. **Assistive and Adaptive Technologies**: Technology that supports students with disabilities, such as screen readers, and virtual pencils.

viii. **Video Conferencing**: This is a video output in which people in different geographical locations can have a meeting. They can see and hear one another, using computers and communications. This ranges from videophones to group conference rooms with cameras and multimedia equipment to desktop systems with some video cameras, microphones, and speakers.

ix. **Voice over Internet Protocol (VolP)**: This enables transmission of voice across the internet. It allows holding of meetings or discussion in which people are connected to phones. Here people share audio information only. There is no face-to-face interaction. It is only the sounds that are connected. A teacher can have an audio conference with his students no matter where they are located as long as they are connected.

x. **The Internet**: This is the heart of Information Age. It is called "the mother of all networks." It is a large computer network available to everyone with a microcomputer and a means to connect it. It is a worldwide computer network which connects hundreds of thousands of smaller networks. The network is made up of wires, cables and satellites. Internet networks links educational, commercial, non-governmental agencies, military as well as individuals.

xi. **World-wide-web (w.w.w.)**: This is the multimedia aspect of the internet. It is often called the 'web'. It is the media inter-connected system of internet computers (called servers) that support specially formatted documents in multimedia form.

xii. **Multimedia**: The word is from 'multiple media' meaning technology which presents information in more than one medium such as text, still images, moving images, and sound. It is the sequential or simultaneous use of variety of media format in a given presentation or self-studied programme.

xiii. **Local Area Network (LAN)**: This is a network which allows all the personal computers under the same roof to share the same peripherals. It connects, usually by cables, a group of desktop PCs and other devices, such as printers, in an office or a building. It could also be the networking of home appliances, linking stereos, lights, heating system, phones, etc.

xiv. **Radio**: A system of sending and receiving spoken messages by using electronic signals. It is common with pilots and security personnel. It is also used in the educational system. It is a system of broadcasting information and programmes that people listen to. It is equally used for instructional purposes in the classroom.

xv. **Digital Television**: This is similar to analogue TV but has the capacity to deliver rich multimedia learning experience. It can be used for both entertaining and instruction.

xvi. **Teleconferencing**: This is the use of television video and sound technology as well as computer networks (including the internet) to enable people in different locations to see, hear and talk with one another.

xvii. **Scanners**: These enable the digitisation of analogue content. Digital items can then be manipulated by software on the computer and stored.

2.4 ICT Competence - Skills and Knowledge

Technology has played a vital role in building up 21st century skills, broadening access to education and personalizing the experience to adapt teaching to the unique needs of learners. Information and Communication Technology should therefore be used as a pedagogically powerful tool for the construction and modeling of knowledge (Yusuf & Onasanya, 2004 in Onasanya, 2009). According to Krumsvik (2008), Computer literacy, media literacy, digital literacy and digital competence are all concepts which highlight the need to handle technology in the digital age.

However, teachers still lack the necessary digital competence to utilize ICT as many of them sees it as destructive while some still ask if it might be relevant to school activities. The basis for this notion in his explanation is that pupils are acquiring digital self-confidence through frequent use which has contextual aspects- learning that take place in and between multiple contexts- and an increasing number

of teachers are recognizing this situation. This stresses the need for teachers to be able to distinguish themselves from other technology users by focusing on education and instruction - not entertainment, social communication and habits- in order to be referred to as being digitally competent.

According to Krumsvik (2008), digital competence can be defined as 'the proficiency in utilizing ICT in a professional context with good pedagogical-didactic judgment and his or her awareness of its implications for learning strategies and the digital building of pupils'. Therefore, digitized situated learning may represent a new form of knowledge building that may be relevant in school context, both as a theoretical lens to understand the pinning of this new knowledge building and regarding the kind of digital competence teachers need in order to handle this broader epistemology.

Knowledge, unlike raw material can be used multiple times without depreciated value and by many people at the same times-it can be shared widely at little cost. Several authors propose the idea of knowledge building as a form of learning and the knowledge- building as the context where it can take place. According to McConnell (2007), Knowledge building is a concept that brings together under one umbrella the curiosity-driven inquiry of the young child and the disciplined inquiry and invention of the mature knowledge worker. The knowledge building community extends the concept of knowledge building to situations where school students are committed to developing and extending shared understanding. Knowledge building communities have four characteristics as follows;

i. Focus on knowledge and the advancement of knowledge rather than tasks and projects.

ii. Focus on problem solving rather than performance of routines.

iii. Dynamic adaptation in which advances made by members of the learning community change the knowledge conditions requiring other members to re-adapt, resulting in continual progress.

iv. Intellectual collaboration as members pool intellectual resources, making it possible for communities to solve larger problems than can individual or small groups.

According to Uwaifo (2011), basic technology as a subject requires the acquisition of skills involving knowledge, judgment, accuracy, and usually manual dexterity. He further listed approaches used in the identification of skills in basic technology which includes: Competency-based approach, job analysis approach, task analysis approach, occupational area approach, and modular approach.

- Competency-based approach: This approach requires competency specified for proficiency level in any given work in basic technology. The following steps towards competency:

i. Identify all task or operations to be learnt.

ii. Arrange task in appropriate courses.

iii. Organize knowledge and work skills for each task to be learnt to hierarchy of difficulty.

iv. State what should be done in order to master each skill or knowledge.

- Job analysis approach: Job analysis approach is concerned with identifying training content of works and involves;

i. Identifying the criteria needed to achieve success on the job; and

ii. Identifying the traits that will predict the criteria for success

- Task analysis approach: Task analysis approach is concerned with breaking works into smaller component and is therefore relevant to production. The following steps are relevant to developing a task:

i. Breaking an occupation into various tasks for example, in woodwork, cutting wood, making joints and assembling the joints are tasks.

ii. Breaking the task into specific learning activities like measuring and setting out.

iii. Validate the activities through a review of job functions to materials and methods for performing.

iv. Identify the material and methods for performing each activity like wooden rules, saws, and type of wood.

v. Implement the activities.

- Occupational area approach**:** This approach overlaps and the implication of such overlap can be found in technical competencies in that learning and coordinating from one occupation can offer their services in another occupation and vice versa. Therefore, this approach may be of great use in curriculum in that such occupation will involve levels of technical knowledge for efficient performance of the skills, ability, attitude and understanding of the profession.

- Modular approach: Modular approach is an effective method of teaching skill oriented programmes. It involves arrangements in which appropriate work skills in basic technology are identified, arranged sequentially, and then used for training purpose. The modular approach is flexible enough to accommodate a variety of teaching and learning environment and occupational goals of the trainee forms the basis for programme planning.

2.5 Application of ICT in Teaching

No matter how undeveloped countries might be, virtually most of them recognize that ICT development is the key to future prosperity. Therefore, teachers' pedagogical content knowledge in era of technological advancement must develop to take account of ICT, noting that the speed and extent of the development can vary between teachers depending on their degree of confidence and competence with these technologies (Kennewell & Beauchamp, 2008). Ajelabi, (2005), opined that individual differences among learners can influence the outcome of instruction. In recent times, many researchers have lamented on the integration of ICT into the curriculum as a major factor for curriculum developers. Some based their criticism on teachers not been taught in their training institutions, inability of teachers to decide the appropriate use of it for instruction, lack of teachers' knowledge of subject matter and so forth.

According to Kemmis et al. in Tella et al., (2007), there are three main approaches to ICT which can be taken by teachers. They are as follows;

i. Integrated Approach: planning the use of ICT within the subject to enhance particular concepts and skills and improve students' attainment. This involves a careful and considered review of the curriculum area, selecting the appropriate ICT resources which will contribute to the aims and objectives of the curriculum and scheme of work, and then integrating the use of relevant lessons.

ii. Enhancement Approach: planning the use of an ICT resource which will enhance the existing topic through some aspects of lessons and tasks. For example, using an electronic white board for presenting theory about a topic. In this approach, the teacher plans to complement the lesson with an innovative presentation method to promote class discussion and visualization of problems.

iii. Complementary Approach: using an ICT resource to empower the pupil's learning, for example by enabling them to improve their class work by taking notes on the computer, or by sending home work by email to the teacher from home or by word processing their homework.

Therefore, educators have shown concern on how instructional needs are met while making use of ICT as a mode in instructional delivery. Some amongst many ways in which include the following:

i. Computer Managed Instruction: This refers to programme that evaluate and diagnose students' need, guide them through the next step in learning and record their progress. Onasanya (2009) citing Harold (1981) classified the functions performed by

computer managed instruction into two as follows: the function support- for basic users, including students, instructors, administrators and curriculum developers and evaluators- and the instructional management related functions- such as diagnosis of students, making prescription based on results of test, monitoring the performance of students, allocating or scheduling the instructional resources specified by the prescriptive process and reporting through storage in the data base for records.

ii. Computer Aided Design (CAD): These are graphics software which offers a variety of 3-dimensional modeling and visualization features. They allow images to be rendered completely, dangerous events to be simulated and making tedious tasks to be easier and less time consuming.

iii. Computer Assisted Instruction: Though popularly referred to as CAI, it has several nomenclatures such as Computer Assisted Learning (CAL), Computer Based Learning (CBL), Computer Based Training (CBT), etc. it is an interactive technique which allows computer to be used for presenting instruction and also monitor the process of presentation. It can be used in the classroom in the area of drill and practice, tutorial, simulation demonstration, designing, data collection, analysis and games.

iv. Programming: this is the art of conceiving a problem in terms of the steps to its solution and expressing those steps as instruction for the computer to follow. Students and teachers can develop their programme using special computer programmes like BASIC, FOTRAN, COBOL, etc.

Therefore, knowledge in the use of computer technology such as privacy and artificial intelligence, skills in flow charting, skills in software and hardware maintenance, etc. would also be of beneficial knowledge in the process of using ICT for classroom instruction. Teachers should endeavour to integrate ICT in teaching as it provides different modality to instruction and also makes it less cumbersome.

2.6 ICT for Education

2.6.1 Explicit ICT Policy for Education

According to UNESCO (2011), Information and Communications Technologies (ICTs) in schools are seen by policy makers as an opportunity. Yet, once policy makers consider making significant investments in ICT, a host of questions emerge, from how many computers are needed in a school to how teachers can use them. Yusuf (2005), lamented that the first time Nigeria had a policy document on IT was National Policy on Computer Education in 1988. The document contained information on the application of computer at various levels of the country's education, and with issues related to basic objectives, hardware and software requirements. He furthered that the government took a bold step in 2001 when it came up with the National Policy on Information Technology, tagged "Use IT". The policy has within its purview the vision, mission, general objectives and strategies for the implementation of the policy, and sectoral application for all sectors but education was subsumed under human resource development and the document was silent on the education of the disabled and other disadvantaged.

It could be recalled that in 2004, the government who claims to tailor the country's educational goals in relevance to the needs of individual and those of the society in consonance with the realities of our environment and the modern world introduced the 4th edition of National Policy on Education which had some policy innovations and changes among which was the introduction of ICT into the school system. To actualize this goal, the document states that government will provide basic infrastructure and training at the primary school, computer education as a pre-vocational elective at the junior secondary school and as a vocational elective at the senior secondary school (FGN,2004). It also had the intention to provide necessary infrastructure and training for the integration of ICTs in the secondary school system but saddens to find out that chalkboard and textbooks continue to dominate classroom activities in most Nigerian secondary schools (Adomi & Kpangban, 2010).

Another major policy document in 2004 according to Yusuf (2005), was the Ministerial Initiative on Education for the Nigerian Education System. The document contains information on the theoretical framework for e-education in Nigeria, analysis of the Nigerian situation, that is, factors inhibiting or promoting the integration of ICTs in education, components of e-education in Nigeria, e-education blue print, elements of the blue print strategies, decade goals (2015), mid-decade goals (2009) and the action plan, among others. The ministerial initiative document though not encompassing enough to address ICTs integration in Nigerian schools, contained policy statements, which could leapfrog the integration of ICT in Nigerian schools.

However, the removal of the Minister of Education who initiated the document, probably accounts for non-implementation of the document.

Though the ICT evolution will take place with or without systematic, comprehensive and articulated policy, but the lack of a coherent policy is likely to contribute to the development (prolonged existence) of ineffective infrastructure and a waste of resources. Few years back in Nigeria, as a result of absence of policy at the ministerial level which did not help in coordinating ICT projects and programmes being carried out by various agencies as stated in the National ICT policy draft in 2012. The government's action in 2011 was an inspiring one and believed by many to be a bold step of being a technocratic nation, when the Nigerian President appointed a Minister for the new Ministry of Communications and Technology. The minister went ahead to set up an Adhoc committee on 25th of August to harmonize all the various policies for the different sectors in the ICT industry.

Remarkably, the need for capacity building ICT training and skills development- is addressed in the national ICT policy. According to the document's section 7.7 on capacity building, the objectives of the document are;

i. To integrate ICT into the national education curriculum
ii. To promote the culture of lifelong learning
iii. To promote development of ICT skilled personnel
iv. To support training and capacity building among the public sector employees in the development and use of ICT tools and application to improve the delivery of educational services.

The strategies to achieve the above stated objectives are as follows;

i. Develop and facilitate the development and globally competitive training institutions in the field of ICT;

ii. Introduce mandatory training and appropriate courses for the ICT at all tiers of education

iii. Encourage continuous training for professionals through specialized training institutes

iv. Foster an ICT driven educational administration and environment.

v. Train and retool teachers and facilitators at all level of education to enhance ICT competence.

vi. Promote ICT awareness and proficiency in mass and non-formal education with emphasis on children, women and the physically challenged.

vii. Promote the development of instructional materials in electronic format.

viii. Develop and implement ICT training programs for public sector employees in connection with introduction of e-government and other digital functions with government offices.

The ICT strategies as seen above are typically more focused on educational needs than educational strategies on ICT needs. It would be worthy to note that changes are common social facts of life, as many embraces it, so do many rebel it just as we have in Nigeria. Education without doubt is among the tools for general changes, but the Nigerian Education sector is despicable; its practices of freedom for societal development has been interrupted and subverted (by faulty policies, low

commitment and weak structures). The sector which is experiencing - economy, social and polity – frustrations instead of an organized fulfillment for the survival of the social system had brought about constant innovations and changes in the policy of Education (Mahuta & Inuwa, 2011). A good conclusion is that ICT in Education can have great impact when policies and programmes support educational strategies and transformation.

2.6.2 Model for Systemic Development of ICT for Education

According to UNESCO (2011), the economic and social factors offer four alternative, complementary approaches or models of how education can contribute to development. Each provides a different policy vision for the education system. Together, they represent a progressive trajectory for educational change and transformation and can contribute to development as follows:

i. **The Basic Education Approach**: The policy goals are to increase primary school participation, to increase the number of people that enter the formal economy, and to provide the skills that would improve health and welfare and also supply the education system with a corps of teachers with at least minimum subject matter knowledge and teaching skill. Curriculum should centre on basic literacy and numeracy skills and schools operate based on the standardized delivery of content while the use of technology is for administrative purposes if there is any.

ii. **The Knowledge Acquisition Approach**: Its policy goal is to increasing secondary level enrolments capable of taking up new technologies and contributing to

economic productivity. Teachers are expected to have a comprehensive knowledge of their field and continuing professional development may not be required if mastery is achieved. The curriculum enumerates a large number of facts and concepts within school subjects such as ICT and emphasizes their acquisition. Technology when low is used primarily to deliver instruction and if high is used by students for individualized instruction.

iii. **The Knowledge Deepening Approach**: Here, the policy goal is to improving the understanding and problem solving skills of students and connecting school learning to real world problems and contexts. Teachers are expected to have a deep understanding of their field and principles of pedagogy and are achieved through a combination of continuing formal and informal experiences. The curriculum identifies key, interrelated concepts and principles that organize the subject area and its implementation is responsive to local contexts. Simulations and multimedia are used to support deep understanding of interrelated concepts, address misconceptions, explore systems, and solve problems.

iv. **The Knowledge Creation Approach**: The policy goal is to increase innovation and knowledge creation to drive the knowledge economy through joint efforts from schools, teachers, and students. Teachers as experienced professionals are primarily responsible for their own and each others' development, as colleagues and mentors as they collaborate with each other and with outside experts to build a professional community. The curriculum is flexible and responsive to student goals and local contexts. It emphasizes the development of collaboration, inquiry, information

management, creativity, and critical thinking skills and learning how to learn is essential. Pervasive technology and social networks are used to help teachers and students build knowledge communities.

2.6.3 Conditions for Integration of ICTs in Classroom

Information and Communications Technologies (ICTs) as one of the driving forces of globalization is bringing people together, and bringing decision makers unprecedented new tools for development. Also, there is fear that the world's poor might be excluded from the emerging knowledge-based global economy." (UNDP - APDIP, 2004). In order to enhance 21st century skills in the field of Education, policy makers and practitioners should focus on seven key conditions as stated by International Society for Teacher Education (2008) as it allows for proper integration of technology as follows:

i. Effective professional development for teachers in the integration of technology into instruction is necessary to support student learning.

ii. Teachers' direct application of technology must be aligned to local and/or state curriculum standards.

iii. Technology must be incorporated into the daily learning schedule (i.e., not as a supplement or after-school tutorial).

iv. Programs and applications must provide individualized feedback to students and teachers and must have the ability to tailor lessons to individual student needs.

v. Technology use must be incorporated in a collaborative environment to be most effective.

vi. Project-based learning and real-world simulations must be the main focus of instructional technology utilization.

vii. Effective technology integration requires leadership, support, and modeling from teachers, administrators, and the community/parents.

In order to integrate ICT effectively into the system, strategies should balance economic and social issues to allow combination of sectoral growth with the development of society.

2.7 Problems militating against the Utilization of ICT in Teaching

i. **Lack of technically experienced teachers**: Majority of teachers who had been contracted are not skilled in the use of ICTs for instructional purpose. Most higher institutions cannot boast of competent lecturers in the use of technology for instruction, thus they cannot model good use of technology (Yusuf, 2005).

ii. **Professional development of Teachers**: Teacher professional development and initial teacher training are an important issue in the component of ICT in education. Consequently, ICT policies and programmes related to teacher training needs be structured in a way that connects to specific classroom practices or engages teachers in a community of professional practice and ongoing development, policies that have proven to be effective in school reform (UNESCO, 2011).

iii. **Lack of Electric Power Supply**: It was projected that Nigeria will be a net supplier of electric power by the end of 2009 when it's massive across country electric power grid construction projects are completed. According to Agyeman

(2007), rural communities are off because of the absence of infrastructure. In pursuit of the vision to improve access to electric power, -most especially by rural dwellers- the government signed into law the Nigerian Electric Power Sector Reform Act (EPSRA) which established the Nigerian Electricity Regulatory Commission (NERC) and the Rural Electrification Agency (REA).

Other problems according to Jones (2004) as cited by Agyei & Voogt (2011) include;

i. Lack of confidence among teachers during integration,
ii. Lack of access to resources,
iii. Lack of time for the integration,
iv. Lack of effective training,
v. Technical problems on the use of software,
vi. Lack of personal access during lesson preparation,
vii. Age of teachers,
viii. Poor fit with curriculum and
ix. Poor administrative support.

2.8 Empirical Studies

The following related studies reveal the utilization of ICT in instructional delivery by teachers in schools. Though few international studies were reviewed, effort was made to address its impacts on Nigerian secondary schools. Subsequently, several studies carried out locally which have significant effect on utilization of ICT in instructions by teachers were also reviewed.

In a study carried out on ICT resource utilization by Jude and Dankaro (2012) in Benue State in which five schools and forty teachers were sampled, the study revealed that 87.5% of the sampled does not have computers/laptops. 80% of those who had laptops/computers were not connected to the internet, while 67.5% could not access the internet using persona mobile device. Fakeye, (2010), also investigated English language teachers' knowledge and use of ICT in Oyo State and found that availability of computers and internet was non-existent in virtually all the schools studied. Chattel,(2002); Cheng, (2003); Chiemeke, (2004) in AbdusSalam, (2010) on teachers' use of ICT also concluded that most secondary schools have either insufficient or no ICT tools to cater for the increasing population of students in the schools and where they are available, they are by implication a matter of out-of-bounds to the students.

A study carried out in Jordan by Jawarneh, El-Hersh and Khazaleh, (2007), in exploring Vocational Education teachers' adoption of ICT reveals that teacher have both low to moderate ICT skills and the degree to which they incorporate ICT in their instruction. Lawal, Ahmadu and Dogara (2003) also conducted an investigation into the six selected secondary schools in Kano Metropolis. Finding among others revealed that half of the teachers were IT literate but very few used ICT in instruction. Salau (2003), study on promotion of ICT usage in instructions revealed, "that nations who adopt rigid ICT human resource or skill development policies run the risk of expanding the gap between ICT skills demand and supply".

A report from UNESCO (2011) on transforming education through the power of ICT policies, stresses the urgent need for correct integration of technology into teaching and learning. In another study carried out according to a survey on teachers' potential on ICT utilization by Kiridis, Drossev and Tsakiridou, (2006), majority of teachers in Greece were not fully convinced about the potentials of ICT due to their low ability level in ICT utilization. Some studies on application and adoption of ICT in Nigerians schools also showed that most Nigerian junior secondary schools teachers are yet to harness the opportunities offered by ICTs in instructional delivery process in which Kwara State is part of (Olatokun & Folaranmi, 2008; Adomi & Kpangban, 2010). According to ISTE (2008) report on using ICT in classroom "merely purchasing computers and practice software is not enough to makes alignment of software to curricular standards, effective school leadership and professional development are equally as important".

Ali, Haolader, and Muhammad, (2013), carried out an empirical study on factors influencing use of ICT to make teaching and learning effective. A sample of 90 teachers and 75 administrators in which 101 (61.2%) fully completed questionnaires were returned- 70 were filled by teachers and 31 by administrators respectively. The findings of the study revealed that teaching staff and administrators had a strong desire to integrate ICT into teaching and learning process. Also, Ajelabi and Agbatogun (2010), carried out a study on teachers' perception on ICT in instruction. Teachers were of the view that ICT should be utilized in schools as soon as possible to support learning.

Five schools were surveyed - two public and three private Kenyan schools by Gakuu and Kodombo (2008). The results showed that the integration of ICT in curriculum delivery in Kenyan secondary schools is influenced by the ownership of the schools. Also, an investigation by Idoko, and Ademu (2010), on the challenges of ICT for teaching/learning as perceived by Agricultural science teachers in 210 secondary schools from the three educational zones in Kogi State found that ICT facilities were not available in secondary schools.

2.9 Summary

Conceptualization of ICT, Basic Technology as a subject, ICT in Education and ICT for Education explained in details the variable that make up the study – ICT utilization, instructional delivery and basic technology. The study used Milken Exchange on Educational Technology, mode for systemic development of ICT for Education and seven key conditions by ISTE to describe in detail how ICT can be utilized in instructional delivery of contents. The review of related studies employed in this study revealed the objectives and impact of basic technology as a subject, and how ICT application in instruction has brought about shift in resource based paradigm to knowledge based paradigm and how they are in line with this study.

Despite the fact that most research studies reviewed in this literature was carried out in different places, suggestions and findings from their studies which are bound to be different have shown strong evidences for the need of development of ICT in teaching, learning and the whole educational process in every states, region and local government so as to reduce ignorance about technology and help lay a solid foundation for true national development in line with recent discoveries.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is concerned mainly with the procedures employed in carrying out the study. These include: Design, Population, Sample and Sampling procedure, Instrumentation, Procedures for data collection and analysis.

3.2 Research Design

The study employed the cross-sectional survey method which is usually prompted by the need to know what the current situation is with regard to a particular academic planning problem. Therefore, the method which allows sampling the opinions of the respondents also allowed the researcher a vivid description of the state of ICT usage in instructional delivery among basic technology teachers in junior secondary schools of Kwara State.

3.3 Population of the Study

The total population of the study is 445 basic technology teachers from 376 Government and Private junior secondary schools in the three Senatorial Districts of the L.G. A. in Kwara State.

Table 3.1 presents the population distribution of each of the selected Government and private secondary schools and teachers in each of the local government and the Senatorial Districts.

Table 3.1: Population Distribution of Teachers and Schools

S/N	Senatorial District	Pop. of Jnr. Sec. Sch.	No of L.G.A	No of Basic T Teachers
A	Kwara North	80	5	96
B	Kwara Central	136	5	162
C	Kwara South	160	6	187
	TOTAL	**376**	**16**	**445**

Source: Kwara State Ministry of Education, Science and Technology.

3.4 Sampling and Sampling Technique

In selecting the sample for the study, 20% of the population was used according to Gay (1987). He opined that for survey research, a sample of 10% of the population is considered minimum and twenty percent may be required for smaller populations. This was done in a proportion of 20:32:37 of the three senatorial districts as resulted from data gathered. The schools selected to represent the samples were private and public based schools. Based on this, the researcher divided the local government areas into their various senatorial district and names of every L.G.As in each classification was written on folded pieces of paper and eight L.G.As were selected from the total 16 classification gotten. Two L.G.As namely Edu and Moro were selected from Kwara North LGAs, three L.G.As namely Ilorin West, Ilorin East and Ilorin South from Kwara Central LGAs and Ifelodun, Irepodun and Offa L.G.As from Kwara South senatorial district due to their proportion in the sample.

Also, a total of 45 government and private junior secondary schools were randomly selected after all the names of schools were written in folded pieces of

paper. 10 schools out of 80 and 20 basic technology teachers out of 96 from Kwara North senatorial district. 16 schools out of 136 and 32 basic technology teachers out of 162 from Kwara Central senatorial district. Kwara South with 19 schools out 160 junior secondary schools and 37 basic technology teachers out of 187.

Table 3.2. represents a sample distribution of Basic Technology as follows:

Table 3.2. Sample Distribution for the Study

S/N	Senatorial District	Sample of Sch.	No of L.G.A	No of Basic T Teachers
A	Kwara North	10	2	20
B	Kwara Central	16	3	32
C	Kwara South	19	3	37
	TOTAL	**45**	**8**	**89**

3.5 Instrumentation

The instrument used for collection of data was the questionnaire. The researcher developed the questionnaires based on relevant literature and personal expertise of researchers in the field and pre- investigations of ICTs in the schools.

The questionnaire which is a Likert response type mode consists of two sections namely A and B respectively. Section A dealt with demographic data and includes information such as educational qualification, gender, school type, senatorial district and years of teaching. Section B included five major parts with ten items for each part on the research questions.

3.5.1 Validation of the Instrument.

The face and content validity were established for the instrument used in the study. Three experts in the field of Measurement and Evaluation and Instructional Technology at the Ahmadu Bello University, Zaria evaluated the instruments in terms of clarity of items, linguistic accuracy and appropriateness of the instrument to achieve the purpose of the study. 65 item questions were on the questionnaire for the validation and with the critical efforts of the experts, 15 items on the questionnaires were considered inappropriate while 50 items questions were retained for the study. Revisions and suggestions made by the panels of experts were taken into account before the final version of the instrument was used.

3.5.2 Pilot Testing

A pilot study was carried out in Government Girls Secondary School, Okesuna, Ilorin, Mount Camel College, Oloje, Ilorin and Government Secondary School, Karuma in Ilorin East Local Government Area of Kwara State, which were not sampled in the final selection for the study. The instrument was administered by the researcher to a total of six basic technology teachers. This enabled the researcher determine the reliability of the instruments, its difficulty level and also to determine whether the questions are free from ambiguity and whether it has power to discriminate over results. This gave room for final corrections of the questionnaire items before the commencement of field work.

3.5.3 Reliability of the Instrument

Reliability co-efficient was calculated using split-half technique. The split-half technique was carried out by randomly dividing the questionnaire into two parts using an even-odd approach. Each half test includes equivalent questions and approximates the same number of questions. The researcher analyzed the data collected for the study using Guthman split-half reliability coefficient on IBM SPSS 20 statistical software. The statistical output shows 0.836 reliability index.

3.6 Procedure for Data Collection

Permission was sought from the Kwara State Ministry of Education Science and Technology, Kwara State Teaching Service Commission and principals of the schools through a letter of introduction from the Researcher's institution. The researcher with the help of two research assistants whom were given guidelines on the modality of administering the questionnaire distributed and collected the copies of the questionnaire from the respondents. A total number of 89 copies of questionnaires were administered for schools with two qualified basic technology teachers in almost all the schools.

Out of the 89 copies of the questionnaires, 88 (98.87%) fully completed questionnaires were returned of which 19(21.59%) were filled by teachers in Kwara North, 32(36.36%) were filled by teachers in Kwara Central and 37(42.05%) by Kwara South teachers. This gave a response rate of 98.87%. This was administered within three (3) weeks.

3.7 Procedure for Data Analysis

The teachers' bio-data and the research questions answered were analyzed using the frequencies and percentages on demographic variables of the respondents. Also, percentage was computed for the calculated 'Available' and 'Not available' statements, 'Competent' and 'Not competent' statements, 'Daily', 'Weekly', 'Once per term' and 'Never' statements (i.e. daily and weekly represents regular utilization, while once per term and never represents irregular utilization) and 'Agreed' and 'Disagreed' statements. (i.e. fairly available and not available represents not available, fairly competent and not competent represent not competent statements).

The percentage was calculated from the frequency of respondents to the items. Any percentage agreed, available, competent and daily item with 50% and above was considered to be of significant effect while any item below or less than 50% was considered not significant.

Likert – Type Scaling

Daily	-	4 points
Available, Competent and Weekly respectively	-	3 points
Fairly available, Fairly Competent, Once per term and Agree	-	2 points
Not available, Not competent, Never and Disagree respectively	-	1 point

The hypotheses were computed using inferential statistical tools. Null hypotheses (Ho) 1 and 2 were tested using t-test and Anova respectively at 0.05 level of significance. This was because, they were the most suitable inferential statistical tools

which can determine whether significant difference exists or not. The researcher employed IBM SPSS 20.0 version software for the data calculation and data storage.

Decision rule: The null hypothesis (Ho) is rejected if the calculated value in the research hypothesis is greater than the corresponding table value (p value) which implies there exists a significance difference (positive). While the null hypotheses (Ho) are retained if the calculated value is less than critical value, it implies that there exist no significant differences (negative).

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents the results and discussion of findings from the investigation conducted on ICT utilization in instructional delivery among basic technology teachers in junior secondary schools of Kwara State.

4.2 Demographic Data

The demographic data were presented in Tables 4.2.1 to 4.2.5

Table 4.2.1: Distribution of respondents by Gender

Gender	Frequency	Percentage (%)
Male	65	73.9
Female	23	26.1
Total	**88**	**100**

Table 4.2.1 showed the distribution of respondents by gender. It indicated that 65/(73.9%) were male and 23/(26.1%) were female basic technology teachers. This revealed that there were more male basic technology teachers than female in the study area.

Table 4.2.2: Distribution of respondents by School Type

School	Frequency	Percentage (%)
Public	50	56.8
Private	38	43.2
Total	**88**	**100**

Table 4.2.2 showed the distribution of respondents by school. It indicated that

50/(56.8%) were public schools and 38/(43.2%) were private schools. This revealed that there were more public schools than private schools as respondents in the study area.

Table 4.2.3: Distribution of respondents by Senatorial District

Senatorial District	Frequency	Percentage (%)
Kwara North	19	21.6
Kwara Central	32	36.4
Kwara South	37	42
Total	**88**	**100**

Table 4.2.3 showed the distribution of respondents by schools in the senatorial districts. It indicated that 37/(42%) were from Kwara South, 32/(36.4%) from Kwara Central and 19/(21.6%) were Kwara North Senatorial District. This revealed that there were more schools in Kwara South as respondents in the study area.

Table 4.2.4: Distribution of respondents by Qualification

Qualification	Frequency	Percentage
NCE	17	19.3
HND/PGDE	16	18.2
DEGREE	54	61.4
MASTERS	1	1.1
PhD	-	-
Total	**88**	**100**

Table 4.2.4 showed distribution of respondents by qualifications. Teachers who had degree -54/(61.4%)- formed the majority of the respondents'. Those with NCE followed with 17/(19.3%), HND/PGDE with 16/(18.2%), Masters had 1/(1.1%), while there were no respondents with Ph.D. degree. This indicated that majority of Basic Technology teachers were degree holders.

Table 4.2.5: Distribution of respondents by Years of Teaching Experience

Years of Teaching Experience	Frequency	Percentage
1-5	11	12.5
6-10	39	44.3
11-15	18	20.5
16-20	10	11.4
21 and above	10	11.4
Total	**88**	**100**

Table 4.2.5 showed the distribution of respondents by number of years of experience. It revealed that majority of the respondents 39/(44.3%) were in their 6-10 years of teaching experience, 11-15 years of experience had 18, representing 20.5%. Those with 1-5 years of teaching experience followed with 11 representing 12.5% and 10/(11.4) respondents each had 16-20 and 20 and above years of experience. This indicated that basic technology teachers are experienced in teaching the subject.

4.3 Research Questions

Research Question One

What type of ICTs are available for teaching of basic technology in junior secondary schools in Kwara State?

To answer this question, questionnaire items one to ten in appendix two were used and the summary of responses is as shown in Table 4.3.1

Table 4.3.1: Summary of Responses on Types of ICTs Available for Teaching

S/N	STATEMENTS	A	FA	NA	TA %	TNA%
1	Desktop	46	40	02	52.3	47.7
2	Generic software application	49	29	10	55.7	43.3
3	LCD Digital projectors	03	10	75	3.4	96.6
4	Internet services/ School intranet/ Satelite dish	15	67	06	17.1	82.9
5	Photocopying machine	73	12	03	82.9	17.1
6	Printer	69	15	04	78.4	21.6
7	Television set	22	10	56	25	75
8	Radio set	18	45	25	20.5	79.5
9	Laptop for for personal use	31	30	27	32.2	64.8
10	Mobile telephone	82	00	06	93.2	6.8
Tot		408	258	214	46.3	53.6

N = 88

Q.I	=	Questionnaire Item	TNA	=	Total Not Available (F+C)
A	=	Available	%A	=	Percentage Available
F	=	Fairly Available	%NA	=	Percentage Not Available
N	=	Not Available	Sig	=	Significant
TA	=	Total Available(A)	N/S	=	Not Significant
N	=	Number of respondents			

Table 4.3.1 showed the percentage responses of respondents on the Types of ICT resources available for teaching among basic technology teachers in secondary Schools in Kwara State. Questionnaire item one sought to assess whether desktop were available for teaching of basic technology in schools. In response to this item, respondents who choose available scored 46, those with fairly available scored 40 and not available had 2. The score for total available for item one stood at 46 representing 52.3% as against 42 for total not available representing 47.7 %.

Questionnaire item two sought to find out whether generic software applications were available for teaching. Responding to this item, respondents who choose available scored 50, those with fairly available scored 29 and not available had 9. The score for total available for item two stood at 50, representing 57% as against 38 for total not available representing 43%.

Item three sought to determine whether there are LCD digital projectors for teaching. In response to this item, respondents who choose available scored 02, those with fairly available scored 10 and not available had 76. The score for total available for item three stood at 2 representing 2.3% as against 86 for total not available representing 97.7 %. Item four was to determine if internet services, school intranet or satellite dish were available to aid teaching of basic technology as a subject. In response to this item, respondents who choose available scored 15, those with fairly available scored 67 and not available had 6. The score for total available for item four stood at 15 representing 17.1% as against 73 for total not available representing 82.9%.

Questionnaire item five sought to investigate if photocopying machine was available for reprography of textual materials for teaching of basic technology. In response to this item, respondents who choose available scored 73, those with fairly available scored 12 and not available had 3. The score for total available for item five stood at 73 representing 82.9% as against 15 for total not available, representing 17.1 %. Questionnaire item six sought to investigate if printer was available for reprography of textual materials for teaching of basic technology. In response to this item, respondents who choose available scored 69, those with fairly available scored 15 and not available had 4. The score for total available for item six stood at 69 representing 78.4% as against 19 for total not available representing 21.6 %.

Questionnaire item seven sought to investigate if television set was made available for viewing of instructional programmes to ease teaching of basic technology. In response to this item, respondents who choose available scored 22, those with fairly available scored 10 and not available had 56. The score for total available for item seven stood at 22 representing 25% as against 66 for total not available representing 75 %. Questionnaire item eight sought to investigate if radio set was made available for listening to instructional programmes to ease teaching of basic technology. In response to this item, respondents who choose available scored 18, those with fairly available scored 45 and not available had 25. The score for total available for item eight stood at 18, representing 20.5% as against 70 for total not available representing 79.5%.

Questionnaire item nine sought to investigate if basic technology teachers had laptop for personal academic activities. In response to this item, respondents who choose available scored 31, those with fairly available scored 30 and not available had 27. The score for total available for item nine stood at 31 representing 35.2% as against 57 for total not available representing 64.8%. Questionnaire item ten sought to investigate if basic technology teachers had mobile telephone for communicating with other teachers of basic technology. In response to this item, respondents who choose available scored 82, not available had 6 while there was no response for fairly available. The score for total available for item ten stood at 82 representing 93.2% as against 6 for total not available representing 6.8%.

The overall score of available ICTs for research question one was 408 representing 46.3% against score of 472 representing 53.6% for those not available. From the rating of the types of ICT available for teaching for basic technology teachers, Table 4.3.1, item ten was rated 1st showing that mobile telephones were largely available for teaching. Item five, 2nd shows that photocopying machines were available. This is followed by item six rated 3rd which shows that printers were available. Item two, 4th shows that generic software applications were available for teaching.

Item one rated 5th shows that desktop are available for teaching. Item nine, 6th shows that teachers' laptops are not available for use. Item seven, 7th shows that television sets are not also available. Item eight rated 8th shows that radio sets were

not available for teaching. Item four, rated 9th, shows that internet services/school intranet/ satellite dish were not available and item three was rated last (10th) shows digital LCD projectors are not available.

Research Question Two

What level of competence or skills do basic technology teachers in Kwara State possess in the utilization of ICTs for teaching?

In order to enable the researcher to answer this question, questionnaire items eleven to twenty were used. The summary of the responses is as shown in Table 4.3.2.

Table 4.3.2: Summary of Responses on Teachers' Competence in ICT Utilization

	I can	C	FC	NC	% TC	% TNC
11	Can access emails	46	24	18	52.3	47.7
12	Create an email account and use it for a sustained series of email correspondence	22	08	58	75	25
13	Do basic searches on the internet	32	29	27	36.4	63.6
14	Download and install software and plugins	08	22	58	9	91
15	Demonstrate the basic tasks and uses of word processors, such as type or open an existing document	63	14	11	71.6	28.4
16	Describe and demonstrate the basic tasks and uses of word processors, such as insert text and images	21	09	58	23.9	76.1
17	Describe and demonstrate the basic features of presentation software such as add animation, transition and sound	18	02	68	20.5	79.5
18	Describe and demonstrate the basic features of presentation software such as navigate back and forth during a powerpoint presentation	24	35	29	27.3	72.7
19	Describe and demonstrate the basic tasks and use of spreadsheet, such as inserting charts, graphs and formatting cell	17	07	64	19.3	80.7
20	Use networked record keeping software to take attendance, submit grades, and maintain student Records.	29	04	55	33	67
tot		280	154	446	31.8	68.2

N = 88

Q.I	=	Questionnaire Item			
C	=	Competent	%A	=	Percentage Competent
F	=	Fairly Competent	%NA	=	Percentage Not Competent
N	=	Not Competent			
TC	=	Total Competent (C)			
N	=	Number of respondents	TNC	=	Total Not Competent(F+N)

Table 4.3.2 showed the percentage responses of respondents on the level of competence or skills basic technology teachers in Kwara State possess in the utilization of ICTs for teaching. Questionnaire item eleven sought to assess if teachers can access emails themselves. In response to this item, respondents who choose competent scored 46, those with fairly competent scored 24 and not competent had 18. The score for total competent for item eleven stood at 46 representing 52.3% as against 42 for total not competent representing 47.7%.

Questionnaire item twelve sought to find out whether basic technology teachers can create an email account and use it for a sustained series of email correspondence. Responding to this item, respondents who choose competent scored 22, those with fairly competent scored 08 and not competent had 58. The score for total competent for item twelve stood at 22 representing 25% as against 66 for total not competent representing 75%. Item thirteen sought to determine whether basic technology teachers can do basic searches on the internet. In response to this item, respondents who choose competent scored 32, those with fairly competent scored 29 and not competent had 27. The score for total competent for item thirteen stood at 32 representing 36.4% as against 56 for total not competent representing 63.6%. Item

fourteen was to determine if basic technology teachers can download software or install plug-in. In response to this item, respondents who choose competent scored 08, those with fairly competent scored 21 and not competent had 59. The score for total competent for item fourteen stood at 08 representing 9% as against 80 for total not competent representing 91%.

Questionnaire item fifteen sought to find if basic technology teachers can demonstrate basic tasks and uses of word processors, such as type or open an existing document. In response to this item, respondents who choose competent scored 63, those with fairly competent scored 14 and not competent had 11. The score for total competent for item fifteen stood at 63, representing 71.6% as against 25 for total not competent representing 28.4 %. Questionnaire item sixteen sought to find if basic technology teachers can describe and demonstrate the basic tasks and uses of word processors, such as insert text and images in documents. In response to this item, respondents who choose competent scored 21, those with fairly competent scored 09 and not competent had 58. The score for total competent for item sixteen stood at 21 representing 23.9% as against 67 for total not competent representing 76.1 %.

Questionnaire item seventeen sought to find if basic technology teachers can describe and demonstrate the basic features of presentation software such as add animation, transition and sound to presentation of powerpoint. In response to this item, respondents who choose competent scored 18, those with fairly competent scored 02 and not competent had 68. The score for total competent for item seventeen stood at 18 representing 20.5% as against 70 for total not competent representing

79.5%. Questionnaire item eighteen sought to determine if basic technology teachers can describe and demonstrate the basic features of presentation software such as navigate back and forth during a powerpoint presentation. In response to this item, respondents who choose competent scored 24, those with fairly competent scored 35 and not competent had 29. The score for total competent for item eighteen stood at 24 representing 27.3% as against 64 for total not competent representing 72.7%.

Questionnaire item nineteen sought to determine if basic technology teachers can describe and demonstrate the basic tasks and use of spreadsheet, such as inserting charts, graphs and formatting cell. In response to this item, respondents who choose competent scored 17, those with fairly competent scored 07 and not competent had 64. The score for total competent for item nineteen stood at 17 representing 19.3% as against 71 for total not competent representing 80.7%. Questionnaire item twenty sought to find if basic technology teachers could use networked record keeping software to take attendance, submit grades, and maintain student records. In response to this item, respondents who choose competent scored 29, fairly competent scored 04 and not competent had 55. The score for total competent for item thirty stood at 29 representing 33% as against 59 for total not competent representing 67%.

The overall score of competence in utilization for research question two was 280 representing 31.7% against score of 603 representing 68.3% for those not competent. From the rating of the level of competence basic technology teachers in Kwara State possess in the utilization of ICTs for teaching as shown on table 4.3.2. Item fifteen was rated 1st showing that typing and opening existing documents can be

done by many basic technology teachers. This is followed by item eleven rated 2nd which shows that basic technology teachers can access emails. Item thirteen which is 3rd, showed that basic technology teachers cannot do basic searches on the internet. Item twenty, 4th showed that basic technology teachers cannot enter data using formula and also keep students record. Item eighteen rating 5th and shows many basic technology teachers cannot operate slides during powerpoint presentations. Item twelve was rated 6th showing basic technology cannot create email accounts. Item sixteen, 7th showed that basic technology teachers cannot insert text and images in documents. Item seventeen, 8th showed that very few basic technology teachers can add animations, sounds and transition to presentations. Item nineteen, 9th showed that basic technology teachers cannot operate on a spread sheet and item fourteen was rated last (10th) showing that very few basic technology teachers can download and install plug-in.

Research Question Three

How frequent do basic technology teachers in junior secondary schools of Kwara State utilize ICT for teaching?

In order to answer this question, questionnaire items twenty one to thirty were used. The summary of the responses is as shown in Table 4.3.3.

Table 4.3.3: Summary of Responses on frequency of ICT utilization for Teaching

S/N	Please estimate how often you use ICTs for	D	D%	W	W%	O	O%	N	N%	R	R%	IR	IR%
21	Remediation of skills not well learnt	15	17	24	27.3	14	15.9	35	39.7	39	44	49	56
22	Communicating with other teachers and staff	33	37.5	34	38.6	15	17.1	06	6.8	67	76	21	24
23	Mastering skills just taught	10	11.3	18	20.5	27	30.7	33	37.5	28	32	60	68
24	Finding out about ideas or information	46	52.3	29	32.9	12	13.6	01	1.1	75	85	13	15
25	Learning to work collaboratively.	25	28.4	44	50	10	11.3	09	10.2	69	78	19	22
26	Accessing research and best practices for teaching.	11	12.5	65	73.9	8	9.1	04	4.5	76	86	12	14
27	Creating materials for students	8	9.1	20	22.7	45	51.1	15	17.1	28	32	60	68
28	Online professional learning	7	7.9	22	25	53	60.2	06	6.8	29	33	59	67
29	Distance viewing of professional programme	14	15.9	28	31.8	39	44.3	07	7.9	42	48	46	52
30	Presenting information to students	35	39.7	27	30.7	22	25	04	4.6	62	70	26	30
Tot		204	23.2	311	35.4	245	27.8	120	13.6	515	59	365	41

N = 88

Q.I	=	Questionnaire Item	%D	=	Percentage Daily
D	=	Daily	%W	=	Percentage Weekly
W	=	Weekly	%O	=	Percentage Once Per Term
O	=	Once Per Term	%N	=	Percentage Never
N	=	Never	R	=	Regular (D+W)
TR	=	Total Response	IR	=	Irregular (O+N)
No	=	Number of respondents	R%	=	Percentage
			IR%	=	Percentage

Table 4.3.3 showed the responses of respondents on how frequent basic technology teachers utilize ICT for teaching. Questionnaire item twenty one sought to know how often ICT is utilized in remediation of skills not well learnt by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 15(17%), those who chose weekly scored 24(27.3%), those with

once per term scored 14(15.9%) and never had 35(39.7%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty one stood at 39 representing 44% as against 49 for irregular utilization (i.e. once per time and never) representing 56%.

Questionnaire item twenty two sought to find out how frequent communications with other basic technology teachers using ICT is done. Responding to the item, respondents who chose daily scored 33(37.5%), those who chose weekly scored 34(38.6%), those with once per term scored 15(17.1%) and never had 6(6.8%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty two stood at 67 representing 76% as against 21 for irregular utilization (i.e. once per time and never) representing 24%. Questionnaire item twenty three sought to determine if ICT is used frequently by basic technology teachers to master concepts taught. Responding to the item, respondents who chose daily scored 10(11.3%), those who chose weekly scored 18(20.5%), those with once per term scored 27(30.7%) and never had 33(37.5%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty three stood at 28 representing 32% as against 60 for irregular utilization (i.e. once per time and never) representing 68%.

Questionnaire item twenty four sought to find out how frequent ICT is being used to find out about ideas or information by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 46(52.3%), those who chose weekly scored 29(32.9%), those with once per term scored 12(13.6%) and never had 1(1.1%). Therefore, score for regular

utilization (i.e. daily and weekly) for item twenty four stood at 75 representing 85% as against 13 for irregular utilization (i.e. once per time and never) representing 15%. Questionnaire item twenty five sought to know how frequent ICT is being used to learn to work collaboratively by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 25(28.4%), those who chose weekly scored 44(50%), those with once per term scored 10(11.3%) and never had 9(10.2%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty five stood at 69 representing 78% as against 19 for irregular utilization (i.e. once per time and never) representing 22%.

Questionnaire item twenty six sought to know how often ICT is utilized to access research and best practices for teaching by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 11(12.5%), those who chose weekly scored 65(73.9%), those with once per term scored 8(9.1%) and never had 4(4.5%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty six stood at 76 representing 86% as against 12 for irregular utilization (i.e. once per time and never) representing 14%. Questionnaire item twenty seven sought to know how often ICT is utilized to create materials for students by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 8(9.1%), those who chose weekly scored 20(22.7%), those with once per term scored 45(51.1%) and never had 15(17.1%). Therefore, score for regular

utilization (i.e. daily and weekly) for item twenty seven stood at 28 representing 32% as against 60 for irregular utilization (i.e. once per time and never) representing 68%.

Questionnaire item twenty eight sought to know how often ICT is utilized for online professional learning by basic technology teachers in the state. Responding to the item, respondents who chose daily scored 7(7.9%), those who chose weekly scored 22(25%), those with once per term scored 53(60.2%) and never had 6(6.8%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty eight stood at 29 representing 33% as against 59 for irregular utilization (i.e. once per time and never) representing 67%.

Questionnaire item twenty nine sought to know how often ICT is utilized in distance viewing of professional programme by basic technology teachers. Responding to the item, respondents who chose daily scored 14(15.9%), those who chose weekly scored 28(31.8), those with once per term scored 39(44.3%) and never had 7(7.9%). Therefore, score for regular utilization (i.e. daily and weekly) for item twenty nine stood at 42 representing 48% as against 46 for irregular utilization (i.e. once per time and never) representing 52%.

Questionnaire item thirty sought to know how often ICT is utilized in remediation of skills not well learnt. Responding to the item, respondents who chose daily scored 35(39.7%), those who chose weekly scored 27(30.7%), those with once per term scored 22(25%) and never had 4(4.6%). Therefore,

score for regular utilization (i.e. daily and weekly) for item thirty stood at 62 representing 70% as against 26 for irregular utilization (i.e. once per time and never) representing 30%. The overall score of regular utilization of ICTs for research question three is 515, representing 59% and irregular utilization scored 365 representing 41%.

From the rating of the types of ICT available for teaching by basic technology teachers, Table 4.3.3, Item twenty six was rated 1st shows that teachers utilized ICT in accessing research and best practices for teaching. Item twenty four was rated 2nd, showing that finding out about ideas or information was largely done by basic technology teachers. Item twenty five, 3rd, shows that teachers' utilize ICT regularly in learning to work collaboratively with other basic technology teachers. Item twenty two, 4th shows teachers utilize ICT to communicate with other basic technology teachers and staff. This is followed by item thirty rated 5th, showing that ICT is utilized in presenting information to students. Item twenty nine, 6th shows that ICT is not utilized for distance viewing of professional programme by basic technology teachers. Item twenty one was rated 7th as it reveals that ICT is not utilized in remediation of skills not well learnt by basic technology teachers. Item twenty three and twenty eight both rated, 8th reveal that ICT is not utilised to master skills just taught and not used to create materials for students by basic technology teachers respectively. Item twenty eight was rated last (10th) as it stated ICT is not utilised for online professional learning.

Research Question Four

What are the perceived benefits of ICT utilization in teaching by basic technology teachers in Kwara State junior secondary schools?

To answer this question, questionnaire items thirty one to forty were used. The summary of the responses is as shown in Table 4.3.4.

Table 4.3.4: Summary of Responses on Perceived Benefits of ICT in Teaching

T

	Variable	A	%	D	%
31	**Have an extensive impact on what students learn and how they learn.**	**69**	**78.4**	**19**	**21.6**
32	**Provides efficient presentation and communication tools.**	**37**	**42.1**	**51**	**57.9**
33	**Have the capacity to strongly support student centered and inquiry based learning.**	**63**	**71.6**	**25**	**28.4**
34	**Challenges one to explore and make discoveries.**	**78**	**88.6**	**10**	**11.4**
35	**Makes school more effective and productive.**	**44**	**50**	**44**	**50**
36	**Contributes to radical changes in teacher development.**	**46**	**52.3**	**42**	**47.7**
37	**Can be used to teach my subject effectively.**	**52**	**59.1**	**36**	**40.9**
38	**Reduce rote learning among students.**	**77**	**87.5**	**11**	**12.5**
39	**Concretize concepts taught than conventional method.**	**40**	**45.5**	**48**	**54.5**
40	**Makes instructing easy and less cumbersome.**	**43**	**48.9**	**45**	**51.1**
TOT		**549**	**62.4**	**331**	**37.6**

t

N = 88

Q.I	=	Questionnaire Item	%A	=	Percentage Agree
A	=	Agree	%D	=	Percentage Disagree
D	=	Disagree	Sig	=	Significant
TR	=	Total Response	N/S	=	Not Significant
N	=	Number of respondents			

Table 4.3.5 showed the responses to the perceived benefits in the utilization of ICT for teaching by basic technology teachers of Kwara State. Questionnaire item thirty one sought to find out if the teachers are of the opinion that ICT utilization can have an extensive impact on what students learn and how they learn it. Responding to the item, respondents who agree scored for questionnaire item thirty one stood at 69 points representing 78.4% against disagree score of 19 points representing 21.6%.

Questionnaire item thirty two sought to determine whether basic technology teachers is of the opinion that ICT utilization can bring about efficient presentation and serve as communication tools. Responding to the item, respondents who agree score for questionnaire item thirty two stood at 37 points representing 42.1% against disagree score of 51 points representing 57.9%. Questionnaire item thirty three sought to check if ICT have the capacity to strongly support student centered and support inquiry based learning. Responding to the item, respondents who agree score for questionnaire item thirty three stood at 63 points representing 71.6% against disagree score of 25 points representing 28.4%.

Questionnaire item thirty four sought to find out if ICT utilization can challenge teachers to explore and also make discoveries. Responding to the item, respondents who agree score for questionnaire item thirty four stood at 78 points representing 88.6% against disagree score of 10 points representing 11.4%. Questionnaire item thirty five sought to determine whether ICT utilization makes

school more effective and productive. Responding to the item, respondents who agree score for questionnaire item thirty five stood at 44 points representing 50% against disagree score of 44 points representing 50%. Questionnaire item thirty six sought to determine if ICT utilization can contribute to radical changes in teacher development. Responding to the item, respondents who agree score for questionnaire item thirty six stood at 46 points representing 52.3% against disagree score of 42 points representing 47.7%. Questionnaire item thirty seven sought to enquire if ICTs can teach basic technology effectively. Responding to the item, respondents who agree score for questionnaire item thirty seven stood at 52 points representing 59.1% against disagree score of 36 points representing 40.9%. Questionnaire item thirty eight sought to determine whether ICT utilization in instruction delivery can reduce rote learning among students. Responding to the item, respondents who agree score for questionnaire item thirty eight stood at 77 points representing 87.5% against disagree score of 11 points representing 12.5%.

Questionnaire item thirty nine sought to find out if ICT utilization could concretize concepts taught than conventional method. Responding to the item, respondents who agree score for questionnaire item thirty nine stood at 40 points representing 45.5% against disagree score of 48 points representing 54.5%. Questionnaire item forty sought to determine if ICT utilization in instruction delivery could make instructing easy and less cumbersome. Responding to the item, respondents who agree score for questionnaire item

forty stood at 43 points representing 48.9% against disagree score of 45 points representing 51.1%.

The overall score of agree on perceived benefits of ICTs utilization for research question four was 549, representing 62.4% against score of 331 representing 37.6% for disagree. From the rating of the types of ICT available for instructional delivery by basic technology teachers, Table 4.3.5, item thirty four was rated 1st enquired if ICT can challenge one to explore and make discoveries. Followed by item thirty eight rated 2nd discussed if ICTs could reduce rote learning among students. Item thirty one, 3rd enquired if ICT could have an extensive impact on what students learn and how they learn it. Item thirty three, 4th shows that ICT utilization could have the capacity to strongly support student centered and inquiry based learning. Item thirty seven was rated 5th enquired if ICT can be used to teach basic technology effectively.

Item thirty six, 6th enquired if ICT utilization could contribute to radical changes in teachers' development. Item thirty five, 7th enquired if ICT utilization could make could make school more effective and productive. Item forty was rated 8th enquired if ICT utilization could make instructing easy and less cumbersome. Item thirty nine, 9th enquired if ICT could concretize concepts taught and item thirty two was rated last (10th) that stated if ICT utilization could provide efficient presentation and communication tools.

Research Question Five

What are the constraints militating against effective utilization of ICT in teaching by basic technology teachers in Kwara State junior secondary schools?

To answer this question, questionnaire items forty one to fifty were used. The summary of the responses is as shown in Table 4.3.5.

Table 4.3.5 Summary of Responses of Constraints Militating against Effective Utilization of ICT

S/N	STATEMENTS Constraints	A	%	D	%
41	Intermittent disruption of electricity	69	78.4	19	21.6
42	Inadequate facilties such as well equipped rooms for ICT equipment	73	82.9	15	17.1
43	Lack of expertise on the use of equipment	64	72.7	24	27.3
44	Unwillingness to learn its usage for instruction	25	28.4	63	71.6
45	Inadequate training in ICT for teachers	66	75	22	25
46	Insufficent time to utilize for instruction	17	19.3	71	19.3
47	Inadequate funding to provide ICT equipment	74	84.1	14	15.9
48	Lack of interest in adopting modern technology for instruction	08	09	80	91
49	Difficulty in scheduling for its usage	76	86.4	12	13.6
50	Ill equiped state resource centers	86	97.7	02	2.3
tot		558	63.4	322	36.6

Q.I	=	Questionnaire Item	%A	=	Percentage Agreed
A	=	Agree	%D	=	Percentage Disagreed
D	=	Disagree	Sig	=	Significant
TR	=	Total Response	N/S	=	Not Significant
N	=	Number of respondents			

Table 4.3.5 showed the responses on constraints militating against effective utilization of ICT in teaching by basic technology teachers in Kwara State. Questionnaire item forty one sought to find out if there is intermittent disruption

of electricity. Responding to the item, respondents who agree scored for questionnaire item forty one stood at 69 points representing 78.4% against disagree score of 19 points representing 21.6%.

Questionnaire item forty two sought to determine whether there is inadequate facilities such as well equipped rooms for ICT equipment. Responding to the item, respondents who agree score for questionnaire item forty two stood at 73 points representing 82.9% against disagree score of 15 points representing 17.1%. Questionnaire item forty three sought to check if there is lack of expertise on the use of equipment. Responding to the item, respondents who agree score for questionnaire item forty three stood at 64 points representing 72.7% against disagree score of 24 points representing 27.3%.

Questionnaire item forty four sought to find out if teachers are unwilling to learn its usage for instruction. Responding to the item, respondents who agree score for questionnaire item forty four stood at 25 points representing 28.4% against disagree score of 63 points representing 71.6%. Questionnaire item forty five sought to determine whether there is inadequate training for the teachers. Responding to the item, respondents who agree score for questionnaire item forty five stood at 66 points representing 75% against disagree score of 22 points representing 25%.

Questionnaire item forty six sought to determine whether the space of time allocated is insufficient. Responding to the item, respondents who agree score for questionnaire item forty six stood at 17 points representing 19.3%

against disagree score of 71 points representing 80.7%. Questionnaire item forty seven sought to enquire if there is inadequate funding to provide ICT equipment. Responding to the item, respondents who agree score for questionnaire item forty seven stood at 74 points representing 84.1% against disagree score of 14 points representing 15.9%.

Questionnaire item forty eight sought to determine if there is lack of interest in adopting modern technology for instruction. Responding to the item, respondents who agree score for questionnaire item forty eight stood at 8 points representing 9% against disagree score of 80 points representing 91%. Questionnaire item forty nine sought to find out if there is difficulty in scheduling for its usage. Responding to the item, respondents who agree score for questionnaire item forty nine stood at 76 points representing 86.4% against disagree score of 12 points representing 13.6%.

Questionnaire item fifty sought to determine if the state resource centers are ill equipped. Responding to the item, respondents who agree score for questionnaire item fifty stood at 86 points representing 97.7% against disagree score of 2 points representing 2.3%.The overall score of agreed on constraint on effective utilization of ICTs for research question four was 558 representing 63.4% against score of 322 representing 36.6% for disagreed.

From the rating of the types of ICT available for instructional delivery by basic technology teachers, Table 4.3.5, item fifty was rated 1st shows the opinion of respondents as to if the state resources centers are ill equipped. Followed by item

forty nine rated 2nd shows the respondents' opinion on difficulty in scheduling of ICTs for utilization in instructional delivery. Item forty seven, 3rd shows respondents opinion as to if there is inadequate funding to provide ICT equipment. Item forty two, 4th shows respondents opinion as to if there is inadequate facilities such as well equipped rooms for ICT equipment for instructional delivery. Item forty one was rated 5th shows the opinion of respondents on intermittent disruption of electricity. Item forty five, 6th shows the opinion of respondents as to if there is inadequate training in ICT for teachers. Item forty three, 7th shows the opinion of respondents if there was lack of expertise on the use of equipment.

Item forty four was rated 8th enquired if there was unwillingness by basic technology teachers to learn ICT usage for instruction delivery. Item forty six, 9th the opinion of respondents if there was insufficient time to utilize ICT for instruction and item forty eight was rated last (10th) that stated if there was lack of interest in adopting modern technology for instruction.

4.4 Testing of Null Hypotheses

The results for test of null hypotheses are shown in Tables 4.4.1 to 4.4.2.

4.4.1 Null Hypothesis One

There is no significant difference between public and private junior secondary schools basic technology teachers of Kwara State in the utilization of ICT for teaching.

The t-test statistics was used to test null hypothesis one at 0.05 level of significance; Result of the finding is presented in Table 4.4.1.

Table 4.4.1: **T-test statistics for public and private schools**

Variables	N	Mean	SD	DF	Tcal	Pvalue	Decision
Public School	50	28.5000	3.25921		.576	.424	Retained
Private School	38	28.9211	3.56698	86			

α=0.05

The descriptive statistics (Mean ± SD) of the school type (public and private) as shown above revealed that private schools (28.92 ± 3.57) had higher average values compared to public schools (28.5 ± 3.26). The table 4.4.1 shows no significant difference between public and private schools teachers' utilization of ICT for teaching. *Tcal.* = 0.576; *P value.* = 0.424. Therefore, there is no significant differences in the utilization of ICT in teaching by basic technology teachers in public and private schools of Kwara State.

4.4.2 Null Hypothesis two

There is no significant difference among basic technology teachers' utilization of ICT in teaching in the three senatorial district areas of Kwara State.

Anova statistics was used to test the 0.05 level of significance. The summary is presented in Table 4.4.2.

Table 4.4.2: ANOVA of difference among senatorial districts.

ANOVA						
Utilization	**SumofSquares**	**Df**	**MeanSquare**	**Fcal.**	**Signi**	**Decision**
B/W Grps	4.142	2	2.071	.178	.838	Retained
Within Grps	990.949	85	11.658			
Total	995.091	87				

α=0.05

a. R Squared = .727 (Adjusted R Squared = .672)

The descriptive statistics (Mean ± SD) of the three senatorial districts (Kwara North, Kwara Central and Kwara South respectively) as shown above revealed that private schools (28.01 ± 2.76, 27.89 ± 3.12 and 29.12 ± 4.12) had higher average values compared to public schools (25.62 ± 1.98, 26.12 ± 2.24 and 28.26 ± 3.02). The table 4.4.2 shows no significant difference between public and private schools teachers' utilization of ICT for teaching. *Tcal.* = 0.178; *F value.* = 0.838.Therefore, there is no significant differences in the utilization of ICT in teaching by basic technology teachers among the three selected senatorial district of Kwara State.

4.5 Summary of the Major Findings

The findings of the study are summarized below,

i. The findings revealed that ICTs such as mobile phones, printer, desktop and so on are available while internet facilities, digital projectors scored low in availability.

ii. The findings showed that many teachers could operate word documents and access emails while only few could download or install plug-in.

iii. The finding was on frequent utilization of ICTs for instructional delivery of content. The responses given to this question could be said to be based on the ICT available to the teachers as most claim mobile phones, photocopies and printers were available and they utilize it on regular basis for one reason or the other.

iv. The findings on perceived benefits revealed that most of the teachers are of the opinion that ICT utilization could bring about effective teaching.

v. The finding on constraints to effective utilization shows that several factors hinder the utilization of ICT in teaching.

vi. The finding of the t-test statistic indicated that there was no significant difference between public and private school on utilization of ICT for teaching.

vii. Finally, the findings shows no significant difference among basic technology teachers usage of ICT for teaching in the three senatorial district of the state.

4.6 Discussion of Findings

Findings on basic technology teachers' perception on the availability and utilization of ICT in teaching in secondary schools in Kwara State reveals are revealed in subsequent paragraphs.

The first objective was to identify the types of ICT resources available for basic technology teachers in instructional delivery in junior secondary schools of

Kwara State. Data collected were analysed and rated. It was observed that mobile telephones, printer, scanner, photocopying machine, standard office software score high while and laptops, digital projectors, internet connections, televisions and desktops scored low.

The finding corroborate with the result of a study carried out on ICT resource utilization by Jude and Dankaro (2012) in Benue State. It is also in line with Fakeye, (2010), who investigated English language teachers' knowledge and use of ICT in Oyo State and found that availability of computers and internet was non-existent in virtually all the schools studied. It also agrees with Chattel,(2002); Cheng, (2003); Chiemeke, (2004) in AbdusSalam, (2010) on teachers' use of ICT also concluded that most secondary schools have either insufficient or no ICT tools to cater for the increasing population of students in the schools and where they are available, they are by implication a matter of out-of-bounds to the students.

The second objective of the study was to evaluate the level of competency or skills of basic technology teachers in the use of ICTs. Based on the analysis of the data collected from the respondents, it was found that most teachers were competent in operation of word document but most could not use spreadsheets, presentation tools and basic internet searches.

The finding is in support of Kiridis, Drosses and Tsakiridou, (2006) conclusion on teachers' facing ICT" that majority of teachers were not fully convinced about the potentials of ICT due to their low ability level in ICT utilization" but is against the work of Lawal, Ahmadu and Dogara, (2003), on investigation into six selected

secondary schools in Kano Metropolis. Finding among others revealed that half of the science teachers were IT literate but very few used ICT in instruction.

The third objective was to determine the frequency of ICT resource utilization by basic technology teachers in Kwara State for teaching. The result showed that the respondents utilize the limited ICTs availability in instructional delivery of content.

The finding is in agreement with the result of the study carried out in Jordan by Jawarneh, El-Hersh and Khazaleh, (2007), in exploring Vocational Education teachers' adoption of ICT is in agreement with the study and also supports Adomi and Kpangban (2010).

The fourth objective was to examine the benefits of effective utilization of ICT for teaching among basic technology teachers. It agrees with two findings of Ali, Haolader & Muhammad(2013), carried out an empirical study on factors influencing use of ICT to make teaching and learning effective and Ajelabi & Agbatogun (2010), study on teachers' perception on ICT in instruction in which teachers were of the view that ICT should be utilized in schools as soon as possible to support learning.

The fifth objective was to examine the constraints militating against effective utilization of ICT for teaching among basic technology teachers. It was observed that ill equipped state resource centers were the major constraints to effective utilization of ICT for instructional delivery of basic technology in the State.

This finding is in line with the work of Salau (2003), on promotion of ICT usage in instructions which revealed, "that nations who adopt rigid ICT human resource or skill development policies run the risk of expanding the gap between ICT skills

demand and supply". It also agrees with ISTE (2008); that merely purchasing computers and practice software is not enough to makes alignment of software to curricular standards, effective school leadership and professional development are equally as important.

The research hypotheses one and two were retained which shows that there is no significant difference between public and private school in the utilization of ICT in teaching and no significant difference in the three senatorial districts.

The findings are is in support of the survey carried out on five schools - two public and three private Kenyan schools by Gakuu and Kodombo (2008). The results showed that the integration of ICT in curriculum delivery in Kenyan secondary schools is influenced by the ownership of the schools. It disagrees with the study of Al-Natour, Alkhamra and Ajlouni(2008) that ' private schools in Jordan made greater use of ICT in instruction than public schools. It is also in support of the study of Olatokun and Folarinmi (2008), "that private owned school in Kwara State are coming up with the use of ICTs in instructional delivery". The study is in agreement with investigation by Idoko, and Ademu (2010), on the challenges of ICT for teaching/learning as perceived by Agricultural science teachers from the three educational zones in Kogi State. They found that ICT facilities were not utilized in secondary schools.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of the study, conclusion, recommendations, limitation of the study and suggestion for further study.

5.2 Summary

The study was carried out to investigate ICT availability and utilization in instructional delivery among basic technology teachers of junior secondary schools in Kwara State, Nigeria. To achieve this, the study was structured into five chapters.

Chapter one dealt with the background to the study where justification for this study was presented. Objectives, research questions and hypotheses were raised. Significance and scope of the study were presented. Chapter two covers the review of related studies, where numerous materials were assessed. The independent variable; Information and Communication Technology (ICT) and other dependent variables; Basic Technology as a Subject, Educational Technology as a field of Study and Instructional Application of ICT were all reviewed as necessitated. Milken Exchange on Educational Technology for instructional process, Problem Based Learning Circle and model for systemic development of ICT for Education were used to back the study. Several empirical studies were also reviewed.

Chapter three presents the methodology used to carry out this study. Survey design and random sampling were used to draw 89 samples in which 88 were

accessible for the study. Questionnaire was the instrument used for data collection. Data collected for the pilot study was analyzed using Guthman split-half reliability coefficient on IBM SPSS v20 statistical software. The statistical output shows 0.836 reliability index.

Chapter four presents results and discussion. Data collected were statistically analysed and result presented in a tabular form. The teachers' bio-data and the research questions answered were analyzed using the frequencies and percentages on demographic variables of the respondents' while t-test and ANOVA were used to analyze the two null hypotheses stated in the study. Summary of the findings and discussion were presented. The two null hypotheses stated, were retained.

Finally, chapter five presents summary of the study, where each chapter discussed was summarized in detail. Conclusion is also presented based on the findings. And recommendations are also made for teacher, parents and policy makers who may be interested on ICT utilization in instructional delivery of basic technology in Kwara State.

5.3 Conclusion

Based on the findings of the study, the following conclusions were made;

That there are no available ICTs for teaching of basic technology and most of the respondents are not competent though some could operate word document, access their mails and also use spread sheet. Also, basic technology teachers in Kwara State do not utilize ICT for teaching on daily basis.

In addition, there are several constraints to effective utilization of ICT in instructional delivery though ICTs are accepted to be useful in the process of instruction delivery by basic technology teachers in Kwara State. Also, there exist no significant differences between public and private schools and among the schools in the three senatorial districts of the state.

5.4 Recommendations

The following recommendations were made based on the findings of the study.

i. The government through the Ministry of Education, Science and Technology (MOEST), should upgrade the ICT centres in the state for utilization by teachers to enhance students' academic performance in basic technology.

ii. The basic technology teachers should endeavour to develop skills in utilization of ICT resources for effective teaching of basic technology in the secondary schools.

iii. Parents should not be left out in the drive to provide and support the utilization of ICT resources in instructional delivery in their children's schools. Once parents and guardians realize the importance of ICTs in the education of their children and wards, they will not hesitate to give moral, material and financial support for their use in basic technology.

iv. Government should make funds available and sponsor basic technology teachers' attendance at conferences, seminars and workshops on utilization of ICT for effective instructional delivery.

5.5 Limitation of the Study

In the course of the study, a number of challenges were encountered which included absenteeism of some teachers, lack of teachers in some of the schools selected and presence of only one basic technology teachers in the school.

5.6 Suggestions for Further Studies

It is suggested that;

i. A way of ensuring a larger scope for this study could be through the involvement of a larger sample from all the local government areas of Kwara State. Future research work should attempt to use more samples drawn from Kwara State.

ii. Researches should also be carried out on teachers' attitude towards adoption of ICT resources for effective teaching of basic technology in Kwara State.

iii. Other study concentrated on investigation of ICT resource utilization in instructional delivery of Mathematics, English or Basic Science in Kwara State and Nigeria at large.

iv. Strategies on integration of ICTs in instructional delivery of basic technology contents should be carried out too.

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APPENDIX I
LETTER OF INTRODUCTION

Dept. of Educ. Found. & Curricuum
Instructional Technology Section,
Faculty of Education,
Ahmadu Bello University,
Zaria, Kaduna State.
12th March, 2014.

Dear Respondent,

REQUEST TO FILL QUESTIONNAIRE

I am a postgraduate student of Instructional Technology Section in the Department of Education Foundations and Curriculum, Ahmadu Bello University, Zaria carrying out a research work on "Investigation of ICT Utilization in Instructional Delivery Among Basic Technology Teachers in Kwara State, Nigeria". Therefore, this questionnaire is to solicit your assistance and cooperation in providing the required information by ticking the items. It is purely an academic exercise for the award of Masters in Instruction Technology. The information provided shall be treated strictly for that purpose.

Thank you for your cooperation.

Yours faithfully,

ADEPOJU, ABIODUN SAMSONDEEN
(M.Ed/Educ/556/2011-2012)

APPENDIX II

QUESTIONNAIRE FOR BASIC TECHNOLOGY TEACHERS
AHMADU BELLO UNIVERSITY
FACULTY OF EDUCATION
DEPARTMENT OF EDUC. FOUND. & CURRICULUM
INSTRUCTION TECHNOLOGY SECTION

Dear Respondents,

Please kindly complete this questionnaire. The survey is being carried out among many teachers across the state that has been selected at random. Your honest responses to the questions will go a long way in providing useful information for the study and shall be treated confidentially.

SECTION A: PERSONAL DATA

Please tick (√) as appropriate on the spaces provided:

Sex: (i) Male [ ] (ii) Female [ ]

Senatorial District: (i) Kwara North [ ] (ii) Kwara Central [ ] (iii) Kwara South [ ]

School Type: (i) Public [ ] (ii) Private [ ]

Highest qualification obtained:

(i) NCE [ ]
(ii) HND/PGDE [ ]
(iii) B(Ed)/B.Sc./B.Tech [ ]
(iv) M.Sc/M.Sc(ED) [ ]
(v) Ph.D [ ]

Number of years of experience in teaching:

(i)	1-5	[ ]	(iv)	5-10	[ ]
(ii)	11-15	[ ]	(v)	16-20	[ ]
(iii)	21 and above	[ ]			

SECTION B

INSTRUCTION: Tick (√) appropriate in the column provided against the option of your choice.

KEY FOR RATING (LIKERT-TYPE SCALING)

S/N	Types of ICT resources available for teaching basic technology in secondary schools in Kwara State?			
	ICT Resources	Available	Fairly Available	Not Available
1	Desktop			
2	Generic software application			
3	LCD Digital projectors			
4	Internet services/ School intranet/ Satelite dish			
5	Photocopying machine			
6	Printer, Scanner and Fax machine			
7	Television set			
8	Radio set			
9	laptop for for personal use			
10	Mobile telephone			
S/N	**What level of competence do basic technology teachers in secondary schools of Kwara State possess in the utilization of ICTs for teaching?**			
	I can	**Competent**	**Fairly competent**	**Not competent**
11	Can access emails			
12	Create an email account and use it for a sustained series of email correspondence			
13	Do basic searches on the internet			
14	Download and install software and plugins			
15	Demonstrate the basic tasks and uses of word processors, such as type or open an existing document			
16	Describe and demonstrate the basic tasks and uses of word processors, such as insert text and images			
17	Describe and demonstrate the basic features of presentation software such as add animation, transition and sound			
18	Describe and demonstrate the basic features of presentation software such as navigate back and forth during a powerpoint presentation			
19	Describe and demonstrate the basic tasks and use of spreadsheet, such as inserting charts, graphs and formatting cell			
20	Use networked record keeping software to take attendance, submit grades, and maintain student Records.			

How frequent do Basic Technology teachers in Kwara Sate utilize ICT for teaching?

S/N	Please estimate how often you use ICT resources for;	Daily	weekly	Once per term	Never
21	Remediation of skills not well learnt				
22	Communicating with other teachers and staffs				
23	Mastering skills just taught				
24	Finding out about ideas or information				
25	Learning to work collaboratively.				
26	Accessing research and best practices for teaching.				
27	Creating materials for students				
28	Online professional learning				
29	Distance viewing of professional programme				
30	Presenting information to students				

What are the pecieved benefits of basic technology teachers on utilization of ICT for teaching in Kwara State ?

	Variables	Agree	Disagree
31	Have an extensive impact on what students learn and how they learn.		
32	Provides efficient prentation and communication tools.		
33	Have the capacity to strongly support student centered and inquiry based learning.		
34	Challenges one to explore and make discoveries.		
35	Makes school more effective and productive.		
36	Contributes to radical changes in teacher development.		
37	Can be used to teach my subject effectively.		
38	Reduce rote learning among students.		
39	Concretize concepts taught than conventional method.		
40	Makes instructing easy and less cumbersome.		

What are the constraints to the effective utilization of ICT in teaching by basic technology teachers in Kwara State secondary schools?

	Constraints	Agree	Disagree
41	Intermittent disruption of electricity		
42	Inadequate facilties such as well equipped rooms for ICT equipment		
43	Lack of expertise on the use of equipment		
44	Unwillingness to learn its usage for instruction		
45	Inadequate training in ICT for teachers		
46	Insufficent time to utilize for instruction		
47	Inadequate funding to provide ICT equipment		
48	Lack of interest in adopting modern technology for instruction		
49	Difficulty in scheduling for its usage		
50	Intermittent disruption of electricity		

APPENDIX III

Table 4.3.1: Responses to Availability of ICTs

S/N	STATEMENTS	A	FA	NA	TA %	TNA%
1	Desktop	46	40	02	52.3	47.7
2	Generic software application	49	29	10	55.7	43.3
3	LCD Digital projectors	03	10	75	3.4	96.6
4	Internet services/ School intranet/ Satelite dish	15	67	06	17.1	82.9
5	Photocopying machine	73	12	03	82.9	17.1
6	Printer	69	15	04	78.4	21.6
7	Television set	22	10	56	25	75
8	Radio set	18	45	25	20.5	79.5
9	Laptop for for personal use	31	30	27	32.2	64.8
10	Mobile telephone	82	00	06	93.2	6.8
Tot		408	258	214	46.3	53.6

Table 4.3.2: Responses on competency in ICT utilization

	I can	C	FC	NC	% TC	% TNC
11	Can access emails	46	24	18	52.3	47.7
12	Create an email account and use it for a sustained series of email correspondence	22	08	58	75	25
13	Do basic searches on the internet	32	29	27	36.4	63.6
14	Download and install software and plugins	08	22	58	9	91
15	Demonstrate the basic tasks and uses of word processors, such as type or open an existing document	63	14	11	71.6	28.4
16	Describe and demonstrate the basic tasks and uses of word processors, such as insert text and images	21	09	58	23.9	76.1
17	Describe and demonstrate the basic features of presentation software such as add animation, transition and sound	18	02	68	20.5	79.5
18	Describe and demonstrate the basic features of presentation software such as navigate back and forth during a powerpoint presentation	24	35	29	27.3	72.7
19	Describe and demonstrate the basic tasks and use of spreadsheet, such as inserting charts, graphs and formatting cell	17	07	64	19.3	80.7
20	Use networked record keeping software to take attendance, submit grades, and maintain student Records.	29	04	55	33	67
tot		280	154	446	31.8	68.2

Table 4.3.3: Responses on frequency of ICTs utilization for teaching

S/N	Please estimate how often you use ICTs for	D	D%	W	W%	O	O%	N	N%	R	R%	IR	IR%
21	Remediation of skills not well learnt	15	17	24	27.3	14	15.9	35	39.7	39	44	49	56
22	Communicating with other teachers and staff	33	37.5	34	38.6	15	17.1	06	6.8	67	76	21	24
23	Mastering skills just taught	10	11.3	18	20.5	27	30.7	33	37.5	28	32	60	68
24	Finding out about ideas or information	46	52.3	29	32.9	12	13.6	01	1.1	75	85	13	15
25	Learning to work collaboratively.	25	28.4	44	50	10	11.3	09	10.2	69	78	19	22
26	Accessing research and best practices for teaching.	11	12.5	65	73.9	8	9.1	04	4.5	76	86	12	14
27	Creating materials for students	8	9.1	20	22.7	45	51.1	15	17.1	28	32	60	68
28	Online professional learning	7	7.9	22	25	53	60.2	06	6.8	29	33	59	67
29	Distance viewing of professional programme	14	15.9	28	31.8	39	44.3	07	7.9	42	48	46	52
30	Presenting information to students	35	39.7	27	30.7	22	25	04	4.6	62	70	26	30
Tot		204	23.2	311	35.4	245	27.8	120	13.6	515	59	365	41

Table 4.3.4: Responses on perceived benefits of utilization in ICT in teaching

	Variable	A	%	D	%
31	Have an extensive impact on what students learn and how they learn.	69	78.4	19	21.6
32	Provides efficient presentation and communication tools.	37	42.1	51	57.9
33	Have the capacity to strongly support student centered and inquiry based learning.	63	71.6	25	28.4
34	Challenges one to explore and make discoveries.	78	88.6	10	11.4
35	Makes school more effective and productive.	44	50	44	50
36	Contributes to radical changes in teacher development.	46	52.3	42	47.7
37	Can be used to teach my subject effectively.	52	59.1	36	40.9
38	Reduce rote learning among students.	77	87.5	11	12.5
39	Concretize concepts taught than conventional method.	40	45.5	48	54.5
40	Makes instructing easy and less cumbersome.	43	48.9	45	51.1
TOT		549	62.4	331	37.6

Table 4.3.5: Responses to constraints militating against effective ICT utilization in teaching

S/N	STATEMENTS	A	%	D	%
	Constraints				
41	Intermittent disruption of electricity	69	78.4	19	21.6
42	Inadequate facilties such as well equipped rooms for ICT equipment	73	82.9	15	17.1
43	Lack of expertise on the use of equipment	64	72.7	24	27.3
44	Unwillingness to learn its usage for instruction	25	28.4	63	71.6
45	Inadequate training in ICT for teachers	66	75	22	25
46	Insufficent time to utilize for instruction	17	19.3	71	19.3
47	Inadequate funding to provide ICT equipment	74	84.1	14	15.9
48	Lack of interest in adopting modern technology for instruction	08	09	80	91
49	Difficulty in scheduling for its usage	76	86.4	12	13.6
50	Ill equiped state resource centers	86	97.7	02	2.3
tot		558	63.4	322	36.6

APPENDIX IV

Scale: ICT Utilization and Instructional Delivery Reliability

Case Processing Summary

		N	%
Cases	Valid	6	100.0
	Excluded[a]	0	.0
	Total	6	100.0

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

Reliability Statistics

Cronbach's Alpha	Part 1	Value	.[a]
		N of Items	1[b]
	Part 2	Value	.[a]
		N of Items	1[b]
	Total N of Items		2
Correlation Between Forms			.884
Spearman-Brown Coefficient	Equal Length		.938
	Unequal Length		.938
Guttman Split-Half Coefficient			.836

a. The item is: VAR0001.

b. The item is: VAR0002.

APPENDIX V

Table 4.4.1: T-test statistical analysis between public and private schools teachers' utilization of ICT for instruction.

Variables	N	Mean	SD	DF	Tcal	Pvalue	Decision
Public School	50	28.5000	3.25921		.576	.424	Retained
Private School	38	28.9211	3.56698	86			

α=0.05

Table 4.4.2: Anova statistical Analysis in the utilization of ICT in instructional delivery among the three senatorial district of the State.

ANOVA

Utilization	SumofSquares	Df	MeanSquare	Fcal.	Signi	Decision
B/W Grps	4.142	2	2.071	.178	.838	Retained
Within Grps	990.949	85	11.658			
Total	995.091	87				

α=0.05

a. R Squared = .727 (Adjusted R Squared = .672)