An Assessment of the Use of ICT in Teaching and Learning in Public Secondary Schools in Northeastern Nigeria

Abubakar Mohammed Abubakar

Submitted to the
Institute of Graduate Studies and Research
in partial fulfillments of the requirements for the degree of

Master of Science
in
Information and Communication Technologies in Education

Eastern Mediterranean University
February, 2016
Gazimagusa, North Cyprus

Approval of the Institute of Graduate Studies and Research

_____
Prof. Dr. Cem Tanova
Acting Director

I certify that this thesis satisfies the requirements as a thesis for the degree of Masters of Science in Information and Communicatıon Technologies in Education

_____
Assoc. Prof. Dr. Ersun İşçioğlu
Chair, Department of Computer and Instructional
Technology Teacher Education

We certify that we have read this thesis and that in our opinion it is fully adequate in the scope and quality and as a thesis for the degree of Masters of Science in Information and Communication Technologies in Education

_____
Assoc. Prof. Dr. Ersun İşçioğlu
Supervisor

Examining Committee
_____

1. Assoc. Prof. Dr. Mustafa İlkan   _____

2. Assoc. Prof. Dr. Ersun İşçioğlu   _____

3. Dr. Fatma Tansu Hocanın   _____

ABSTRACT

The application of information and communications technology in Nigeria and in African countries generally is increasing and dramatically growing. Over the past few years, ICT has turned out to be a step by step more imperative to schools at all levels and to the entire education system at large. There exist an extensive variety of researches focused on the investigation of the utilization of ICT in the process of teaching and learning in Nigerian secondary schools. This study aimed to assess how ICT is used in teaching and learning in Nigerian public secondary schools particularly those from the Northeastern States from the viewpoint of students, instructors and administrators. Built on the three central research questions, the objective of this study is to assess the degree of usage of the ICT facilities in teaching and learning practices.

In this study, a mixed-methods approach for data gathering was applied by using questionnaires and interviews to collect data from students, instructors and administrators in the studied states. The responses were then analyzed based on the research questions outlined in chapter one. The result shows that the use of ICT facilities are very low and this is attributed to the poor policy implementation, lack of basic social amenities and insecurity.

Keywords: Information and Communication Technologies, Northeastern Nigeria, Public Secondary Schools.

ÖZ

Bilgi ve iletişim teknolojisi, Nijerya ve Afrika ülkelerinde gün be gün hızla artarak büyümektedir. Son yıllarda BIT adım adım eğitimin ve okulların tüm dallarında önemli bir yere sahip olmuştur. Litaratürde BIT'in orta öğretim okullarındaki derslere nasıl entegre edileceği ile ilgili bir çok araştırma bulunmaktadır.

Bu çalışmanın amacı, Nijerya'nın Kuzeydoğusu'ndaki okullarda BIT'in nasıl öğretilip kullanıldığını öğrencilerin, öğretmenlerin ve idari yönetimin bakış açısıyla incelemektir. Ayrıca çalışmada, Bilgi ve iletişim teknolojilerinin öğretim ve öğrenim çalışmalarında ne sıklıkla kullanıldığıda araştırılmıştır.

Çalışmada veriler anket, görüşme ve röportaj yöntemi ile toplanmıştır. Veriler Betimsel Analiz yöntemi ile analiz edilmiştir.

Anahtar Kelimeler: Bilgi ve İletişim Teknolojisi, Kuzeydoğu Nijerya, Orta Öğretim Devler Okulları.

This is work dedicated to my Parents and my Family

ACKNOWLEDGEMENT

TABLE OF CONTENTS

viii

LIST OF TABLES

LIST OF FIGURES

Chapter 1

INTRODUCTION

1.1 Background of the Study

Nigeria positions as the tenth biggest country on the planet, and by a long shot the biggest country in Africa. Found north of the Gulf of Guinea in West Africa, Nigeria is verged on the east by Cameroon, on the upper east by Chad, on the north by Niger Republic, and on the west by the Republic of Benin. Nigeria is separated geo-politically into six districts: North-Central, North-East, North-West, South-East, South-South and South-West, with the North-East being the most educationally backward and the most vulnerable to insecurity, poverty, illiteracy and lack of social amenities (Falola, 2011).

Enhanced post primary school training is vital to the formation of successful human capital in any nation (Evoh, 2007). In this way, the necessity for ICT in Nigerian post primary institutions can't be overstressed. In this innovation motivated time, everybody needs ICT capability to excel. Institutions are discovering it extremely important to prepare and re-prepare their workers to set up or expand their insight into PCs and other ICT services (Adomi and Anie, 2006). The above assertions appeal for right on time obtaining of ICT talents by students not just in the north-eastern part of Nigeria but the whole nation states.

The part of innovation in teaching and learning is quickly becoming a standout amongst the most imperative and broadly talked about issues in a modern-day education plan (Rosen and Well, 1995). Majority of the specialists in the area of teaching and learning concurred that, when appropriately utilized, ICT advances hold an incredible potential to enhance educating and learning apart from forming more job opportunities. Poole (1996) has demonstrated that nowadays IT literacy is considered a new literacy and its absence in education is viewed as the new ignorance. This has really gingered a yet another powerful urge to outfit schools with computer gadgets and trained people (educators) important to create mechanically capable and productive students in developing nations of the world. In a quickly changing universe of worldwide labor market rivalry, industrial computerization, and expanding democratization, essential education is important for a person to have the capacity to get to the needed information and to be able to apply it appropriately. This capacity pointed toward the use of ICT as the only solution. It is strongly believed that ICT can facilitate the teaching methods and encourage learners` understanding as can be seen in using softwares like CAI, CAL, CBT etc. Numerous studies have discovered constructive outcome connected with innovation supported teaching and learning (Burnett, 1994, and Fitzgerald and Warner, 1996).

The use of computers in education have ended up as a significant instrument and innovatively affected how we learn and see the world in broad. Today, the place of ICTs in education cannot be quantified. Cutting edge organizations are operating in online and real time modes using smart ICT gadgets via the web. The marvel has brought forth the contemporary e-activities such as trading, marketing, healthcare, education, banking and government. Bamidele (2006) has described ICT

advancement as something that revolutionarised the world through the use of computers and internet and it touches every facet of our lives.

Jimoh (2007) characterized ICT as the taking care of, preparing and transformation of data such as text, pictures, diagrams, and so on in to meaningful information using electronic specialized gadgets, for example, PCs, satellites and internet. Similarly, Ofodu (2007) likewise described ICT as computerized gadgets, helped by man and intelligent materials that can be utilized for an extensive variety of educational activities and for individual use. Going by the above delineations, it can be concluded that ICT is the processing of data using all kinds of technologies for the manipulation of information in every aspect of life.

Bearing in mind the part of education in the national development and the populace blast in government colleges in Nigeria nowadays, the use of computers in instructions delivery gets to be basic. This is on account of its acknowledgment by educators will upgrade powerful instructing. Issues like great course association, powerful classroom administration, self-study, collective learning, and compelling correspondence between the partners in the education area. Instructing and learning has gone past the educator remaining before a gathering of understudies and spreading knowledge to them without the students` sufficient involvements (Ajayi, 2008). There are progresses in the Nigerian school systems which show some level of commitments in the utilization of ICT in teaching and learning. The Federal Government of Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2004), identifies the conspicuous role of ICTs in the current world, and decided to incorporate it into her education system. To realize this objective, the charter expresses that government will give essential facilities and instructions at the

primary school level. At the first three years of secondary school, computer studies has been made a pre-vocational optional, and is a vocational optional at the upper secondary schools. Furthermore, it is the target of government to give all vital frameworks and training for the incorporation of ICTs in the post primary institutions (Okebukola, 1997).

Modern instructional techniques required the use of ICT which provide a more simplified and reliable teaching and learning methodologies. From the students` viewpoint the integration of ICT education help in both cooperative and self-paced learning. Students can adjust their learning paces with immediate feedback and self-assessment in an institution where the new technologies are being used. Such students extend their learning capabilities beyond classrooms as they can communicate with peers from everywhere around the globe. This novel achievement of the 21st century is presently not fully employed in the north-eastern region of Nigerian public secondary schools. This negative development might not be unconnected with the lack of ICT facilities in our public schools, negligence from the authorities concerned or the misuse of the available ICT equipment on the ground by the teachers. This unfortunate situation is in fact, what motivates the researcher to evaluate the level of ICT usage in our public secondary schools.

1.2 Statement of the Research Problem

The adoption and use of ICT in the public secondary schools in north-eastern Nigeria is still under a serious dilemma despite the dramatic increase in the use of ICTs in numerous areas in present days including education. The low rate in the adaptation and application of the new technology especially in the public schools in north-eastern Nigerian is attributed to several factors which include inadequate ICT

facilities in the schools, poor ICT policies, limited information infrastructures, poor perceptions of using ICT in education among teachers, students and the school administrators. In spite of the calls and yearnings for change from the teacher-centered learning to student-centered learning which involve the use of ICT resources, chalkboard and text books are still the most continuously dominant class room facilities in virtually all the public post primary institutions in Nigeria (Okebukola, 1997). The compelling usage of ICT in instruction and learning relies on upon the accessibility of these facilities and the educators' capability in utilizing them. Observation has shown that there are limited functional ICT facilities in most Nigeria public schools especially those in the rural areas. This in turn hinders the urge to use them by the students for learning. Also lack of adequate computer literate from the site of instructors, sporadic power supply and insufficient financial support are another set of deterrent militating against successful usage of ICT facilities and resources in government owned institutions. For that reason, government need to provide enough ICT resources and to train teachers on the effective utilization of the available facilities it their teaching process in order to solve the problem Ajayi (2008).

According to Apagu and Wakili (2015), most of the research works on ICT in education focuses on the availability of the ICT facilities and the perceptions of the use of ICT in the nation`s institutions. Researchers pay less attention to the judicious use of the available ICT resources on the ground. Considering the economic, social and political status of our country and the acceptability of the western education itself, especial in the northern part of the country. One will not expect general acceptance and the availability of adequate ICT resources in our public schools. There is widespread acknowledgment of the necessity to employ the use of the new

technology in teaching and learning as we move in to the time of digitalization of data streaming by means of satellite and the web ruled worldwide data and information dispersal. As of now, Nigeria is still on the negative side of the worldwide digital divide because she is yet to incorporate ICT into post primary educational modules. Most of the educational and managerial tasks in Nigeria collages are still completed physically. Probably, because there are no enough ICT facilities deficiency in teachers` competency or resistance from the side of the teachers. Again it is perhaps due to lack of good policy and readiness from the side of the administrators to get together with the complications of the 21st century. This study is considered so important especially at this present era of information age as it will look in to in-depth understanding of the current perceptions by all the stakeholders and also to understand the policies and politics surrounding the integration and application of computers in the public institutions particularly in that region of the country.

1.3 Aim of the Study

The main objective of this study is to investigate the level of use of ICT in teaching and learning in public secondary schools in North-Eastern Nigeria.

1.4 Research Questions

This study intends to achieve the above aim through the following research questions.

1. What are the students' perceptions on the availability and usage of ICT facilities in their class rooms?

2. What are perception of teachers and their level of competencies in the use of ICT facilities in their teaching profession?

a. What are the teachers opinions on the availability of these ICT facilities and how much they are been used?

b. What are the teachers opinions regarding the policies and interventions toward the use of ICT in schools?

3. What are the opinions of the administrators regarding the use of ICT in teaching and learning in public schools?

a. What are their views about the policies and interventions either by government, private organizations or individuals with respect to the use ICT in schools?

b. What are their opinions on the availability of these technical facilities and how much they are been used?

1.5 Significance of the Study

A statistical survey report released by Join Admission and Matriculation Board reveals that the enrolment of the students In the computer based test (CBT) in the north-eastern states is very low (JAMB, 2015) in view of the above and some related challenges it's a strong reason why this research work is considered important. Moreover, the study is timely and relevant because today it's the use of ICT that is making some nations a highly advance in education. So if ICT is properly integrated in to education system it can make not only the region but the country at large a highly progressive nation.

This study will also provide an enquiry through which the application of this new technology in education can be assess so as to help the administrators to ascertain the level of teachers` competencies and the perception of both the instructors and the learners in using ICT in teaching and learning practices. Again the study will be

useful in discovering the weaknesses of the instructional materials (if any) which will be beneficial to the policy makers because they will make the findings of this study a basis for formulating policies and developing a better strategies for incorporating ICT in academic activities. Furthermore, the study will again be helpful in identifying possible causes of poor usage of ICT facilities in the national exams so that a remedial measures will be instituted to solve the problem and to use the situation as an avenue to seek for more intervention from the federal government and other relevant ICT facilities donor agencies.

1.6 Limitations

This research work, the assessment of the use of ICT in teaching and learning was conducted within the period of July to December, 2015. The study was limited to the public schools in towns and cities of the selected states due to a number of reasons which include insecurity, bad roads and financial constraint.

1.7 Definitions of Key Terms

ICT: Information and Communication Technology/Technologies- is a general term comprises of any communication device or software and the various services and applications associated with them (wikibooks, 2015).

CAI: Computer Assisted Instructions- A self-learning system, generally offline/online, including communication of the students with modified instructional materials (wikieducators, 2008).

CAL: Computer Assisted Learning- is defined as learning through computers using a set of learning packages/materials (wikieducators, 2008).

CBT: Computer Based Training: these are programs occasionally called "courseware" that give two-way instructional meetings to all disciplines (whatis.com, 2011).

ICT in Education: this refers to the teaching and learning using ICT (wikibooks, 2015).

Chapter 2

LITERATURE REVIEW

This chapter will review some of the available works associated with the availability, impact and use of ICT in teaching and learning activities in public post primary institutions. Considering the part played by learning, the chapter will begin by discussing and analyzing the teaching and learning atmosphere in the Nigeria public secondary institutions. The chapter will also discuss but in brief some of the learning theories and see how they match the learning atmosphere/condition in Nigeria especially in the affected states the thesis will again see how ICT can be integrated under such conditions in the affected area of study even though there is still a poor perception of western education in some parts of Nigeria especially in the Northeastern states which is again the domicile of this study.

This study aims at assessing the extent of utilization of the available ICT resources in the classrooms despite the challenges faced. In this literature review, areas more relevant to the research questions already raised and specified in chapter one will also be considered. Those include the availability of using ICT facilities in our public schools, the confidence our teachers have in using ICT, the perception of both teachers and students, and the government policies and intervention toward the use of ICT in our public schools.

2.1 Leaning Theories and their Correlation with ICT

Learning can be seen by many as a process of change in behavior or understanding as a result of interaction with external idea or knowledge. According to the free encyclopedia (Wikipedia) learning theories are calculated structures portraying how data/information is ingested, prepared and hold during learning. Cognitive, feeling, and ecological impacts and additionally related knowledge all have influence in how understanding or a world perspective is obtained or changed and information, idea and expertise are retailed.

• **Behaviorism:** Is the learning theory that disregards all kinds of independent mind activities and focuses largely on the observable behaviors of the learner. In line with this, learning is therefore defined as an acquisition of new behaviors as a result of changes in the environmental conditions. Psychologist such as John B. Watson, Iva Pavlov, F.B Skinner and E.L Thorndike concluded from their various studies that behaviorism is a universal opinion which assumes a learner is fundamentally passive and responding to the stimuli within his/her environment. The theory hypothesized that the learner start off as a fresh and his/her behavior is shaped through positive and negative reinforcements. In line with this, Learning is again defined as an instruction that depends on the observable changes in the learner`s behavior. Those behaviors that can be observed and measured are the student`s active participations in class activities include both physical and those involve the use of ICT facilities such as simulations and online activities.

In this method, technology tools such as digital camera and other facilities provided by learning management system software have been of great help toward observing

students changes in behavior under specific circumstances for a certain period of time. Cameras can be utilized to keep a steady track of various observable behaviors which can help instructor in evaluating and re-evaluating of a specific perception in student`s conduct (Kuter, 2012).

• **Cognitivism:** is a theory of learning that views the learning process as an internal and active mental process, which develops within a learner. Increased mental capacity and skills helps to learn better. This theory focuses on the memory, critical thinking ability, aptitudes and prior knowledge of the learner. Research shows that by 1960, cognitivsm revolution supplanted behaviorism as the overwhelmed worldview which concentrates on the internal mental exercises. The contributors to this theory in their various works include Morrill, Reieluth, Gagne, Briggs, Wager and Brunner.

In the above theory it can be seen that learner here is a viewed as an information processor just like a computer. In with this, information and communication technology facilities such as computer games, simulations, online tutors and other facilities will help in improving the learners` information processing ability and problem solving capability thereby increasing the students' schemer (Beauty of Katapang. 2012).

• **Constructivism:** The term constructivism refers to the fact that learners build Knowledge on their own ways where every learner exclusively and socially develops significantly as he/she learns. Therefore, learning can now be defined as a construction of new Knowledge by the learner. The contributors of this theory

12

include Jean Piaget. Abik and Ajhoun, (2012) lamented that students vigorously partake in knowledge construction as they form their own experiences.

The above theory basically says individuals develop their own particular comprehension and information of the world through connecting with and encountering new things and thinking about those new encounters in the most general sense, this refers to encouraging students to use active technology tools such as smart board, digital videos, audios and computer programs to experiments real-world issues, problem solving etc. thus help them make more learning and after that to consider and discuss what they are doing and how their comprehension is evolving.

• **Connectivism:** is a learning theory (though not generally accepted) that clarifies how internet technology open new doors for both students and instructors to learn and share information across the World Wide Web (www) among themselves. These technologies include webs browser, email, YouTube, wikis, blogs and any other tools which will enable users to learn and share information with others around the globe. The theory is also called a learning theory for a digital age and was advanced by Stephen Downes and George Siemens. (George S., 2005). The proposed hypothesis above tries to clarify complex learning in a quickly changing social computerized world. Learning today concentrates on connecting specific information sets using computer networks, and these links that empower us to acquire more are equally (if not more) imperative than the new knowledge we are looking for. Hence, the ability to synthesize and recognize connections and patterns becomes an immeasurable skill. The technology tools such as computerized database allow students and teachers to tap in to the huge databases of knowledge with a few clicks

to seek for further knowledge such capacity can help to facilitate learning and research (Patrick B., 2013).

2.2 Teaching and Learning in the 21st Centaury

The new millennium was introduced with a sensational digitalized breakthrough. We now live in an ever more diverse, globalize and complex media saturated society. According to Douglas kelner (2008), this innovative transformation will greatly affect our society than that of exchange from oral to print society. This technological development leads to the needs for students to be active participants in information creation and utilization and to be able to communicate fluently and to be functional in both local and international levels. This technological advancement brought numerous changes in our daily lives among which is learning technology for digital age. Learners in this computer age are confronted constantly with a series of computer and social networking applications such as those provided by the web 2.0 tools. As the new technologies continue to grow, they reshape not only the learner's behaviors and needs but also theories and principles of learning processes, instructional design and applications. Again, Downes (2008) pointed out that in the Connectivism model, learning group is depicted as a hub which is always part of a bigger system.

2.3 School, Teacher and Student in the 21st Century

School in the 21st century will be bound with challenged based educational projects continuously attracting students in inclining to genuine issues key to mankind and inquiries that matters. The schools will go a long ways past physical structures to the "nerves centers" with porous and transparent dividers that provide access not just the teachers and students but everyone to the abundance of information that exist on the planet and also facilitate a platform on which the stakeholders can interact with one

another from every part of the globe. So it's a dramatic change from the text book, chalk and black board-driven, teacher centered and paper/pencil schooling to a purely student centered learning system. The teacher is currently transformed from his essential duty as a dispenser of knowledge to facilitator of learning and helping learners to transform data into information, and learning into knowledge. (Silva, 2008).

According to Sherrelle (2012), a 21st century student is one who learns or works collaboratively with class mates and other peers around the world in a global classroom. Unlike in the past, where students sees as someone who goes to school, spent a specific amount of time take recommended subjects receive a passing grades and finally graduate.

2.4 Accessibility of ICT Resources and Student Learning

Utilization of computers and web innovation in instruction is a significant consideration toward instructors everywhere throughout the world (Williams, 2010). Specialists in the field of education like Wodi and Dokubo (2008), are of the feeling that when legitimately grasped, ICT holds awesome guarantee in enhancing educating and learning apart from increasing work power opportunities.

In an expanding and fast changing universe of worldwide business sector rivalry, mechanization, and expanding democratization, fundamental learning is vital for a person to be able reach to the knowledge and to apply that knowledge. Such ability is provided only by the Information and Communication Technology. The capacity to get to and adequately use information is no more an extravagance but a need for any improvement (Stephen, 2013). The utilization of new innovative gadgets, for

example, PCs, web, CD-ROMs, intelligent video plate guideline, Computer Assisted Instruction, Computer Based Instruction, Computer Based Learning, e-learning, and others for educational modules conveyance have been observed to be extremely viable in instruction and learning. Nwosu, (2009) pointed out that these new advances make learning less demanding, speedier, energizing and fascinating to learners. Adding that computer is an innovation with numerous capacities, some of which are to help with classroom procedures. Hence giving concrete and sensible encounters and make data processing simpler speedier, effective and fun.

Okwo (2006) also observed that the accessibility to ICT or Computer Assisted Instruction (CAI) demonstrated ability to give tangible and sensible encounters which makes information handling less demanding, quicker and more effective. This is on the grounds that it conveys outside encounters to the classroom in this manner furnishing the learners with the chance to go past the abilities of their educators.

In spite of these praiseworthy focal points, Nigeria is tragically behind even among the African nations in the utilization of ICT as it respects to instructive conveyance. In a study, Zumyil and Ezemma (2006) related the hopeless execution of optional school students on elements, like labor, learning and utilization of computer helped guideline. Researchs have likewise confirmed a low level of ICT mindfulness in a majority of Nigerian post primary institutions (Eroha and Ekweme, 2007). These discoveries are parallels with that of Nwosu (2009) who lamented that post primary institutions in Enugu State have couple of PCs utilized only for authoritative work but not for instructive purposes or as educating helps. This proposed the quantity of PCs accessible in schools is insufficient for the students' populace (Stephen, 2013).

2.5 Availability of ICT Resources and Student Learning

It is believed that the effective assimilation of ICT in the educational system depends to a great extent on the accessibility, ability and the state of mind of instructors towards the use of the cutting edge innovation in instruction and learning. Idoko and Ademu (2010) found out that availability of ICT is often one of the most critical impediments to technology acceptance and integration in teaching and learning. They demonstrated that there is persistent necessity for more ICT facilities if a nation is to effectively incorporate ICT into its public collages. In an attempt to provide adequate ICT facilities to secondary schools in Nigeria, the Federal Government ordered a Mobile Internet Unit (MIU) through the Nigerian National Information Technology Development Agency (NITDA). The MIU is a customized vehicle that has been changed over into a portable mobile station and digital web hub. It is comprises of ten workstation computers, all organized and associated with the web. The MIU is additionally outfitted with printers, scanners and some other multimedia amenities. Internet service is given by means of VSAT a 1.2m satellite bowl fixed at the roof of the transport van which was furnished with a little power source to guarantee customary supply of electric power. The MIU distributes the web service across the different institutions (Adomi and Kpangban, 2010). They added that the quantity of these vehicle vans is so little and in this way most village institutions are yet to benefit by this errand. Fakeye (2010) likewise discovered in a study conveyed in Ibadan that in a large portion of schools studied don't have PCs, henceforth are not associated with the web (internet). Adding that the individuals who have computer systems don't utilize them for educating however exclusively for managerial purposes.

Abdul-salaam (2012) indicated in the consequence of his study that computer resources were not promptly accessible by the students from the institutions covered by his research. In addition, the study demonstrates that the vast majority of the Nigerian secondary schools are not associated with the web. Those with PCs don't have the important instructive programming required by their students in general cases. What's more, the PC accessible in these schools can't carter for the needs of the huge populace of learners in the affected institutions. A few institutions with web availability were also disconnected as they cannot afford to pay their access fee. This findings correlates with that discoveries of Fakeye (2010) and Oyejola (2007) that most collages in Nigeria are not well prepared for the utilization of ICT. It is also good to understand that the tendency to use ICTs in teaching and learning activities is highly determined by the availability of these resources in the schools. In a study that explored factors that influence the utilization of ICT in Sub - Saharan African schools. Kiptalam and Rodriguess, (2011) reveal that the integration of technology into education is exceedingly reliant on the accessibility and availability of the resources in schools. This study also believed that Nigeria will not be an exception.

2.6 Perception on the use of ICT in Teaching and Learning by both Students and Teachers

Students formed the largest part of any academic community and their viewpoint has to be respected. Considering the role they play in any activity that takes place in the school settings, psychologist argued that student should be seen as dynamic and integral members of the learning community not just as aloof beneficiaries or even a mere consumers.

Amayuayi (2012) is in the feeling that ICT evacuates issues concerning space and time where students can correspond with their teacher and exchange information anywhere, anytime. As a rule the students can bring from a worldwide pool of learning as ICT makes serving and sharing of information simpler. The learners can exclusively and/or together make notes and presentations therefore enlist their advancement and use it for examinations along these lines they are additionally prepared for future support in worldwide exploration and correspondence. Once more, partners in the field of instruction technology agreed that ICT in training will promote students cognitive qualities through higher order thinking, critical reasoning, enhanced relational abilities and profound comprehension of the learning apparatuses and ideas to be taught. Promoting a strong, intuitive educating and learning environment by making more extensive learning correspondence and hence give learning instruments to students particularly those with exceptional needs. Utilizing computer produced design to outline connections of numerous types particularly methods that can't be represented manually by individual. (Amajuoyi, 2012)

Educators, according to Ahmad (2010), recognize its capacity to make both autonomous and collective learning environment in which learners can understand more effectively. In fact, the finding of a study conducted by Yunus, Salehi and John (2013) has shown that teachers have a positive perception that the uses of visual aids arouse students' interests towards learning. Moreover, ICT is of great importance in improving communication skills for computer mediated communication (CMC) provides learners with the opportunities to communicate not only locally but globally for they feel less secured to communicate (Sweeny, 2010).

Teachers and school administrators are skeptical about the challenges facing the integration of ICTs in teaching-learning process. These include; poor electric power supply, lack of knowledgeable ICT support personnel, inadequacy of trained teachers in the field of lCT, lack of funds, high cost of ICT equipment, materials and accessories, government's payment to support the implementation of ICT policies, inadequate telephone services, lack of proper maintenance of the broken down equipment and facilities and shortage of ICT facilities. There is most likely that instructors and students in northeastern Nigeria will have numerous amount of learning resources at their disposal if government lives up to its expectation in the implementation of ICT policies (Amuchie, 2015). The poor availability level of ICT resources in Nigerian secondary schools also means accessibility will be hindered for instructional development purposes. This confirms the observation of Ezeoba, 2007 and Fakeye, 2010 who also found that ICT resources were not available in primary and secondary schools.

2.7 ICT Facilities and their Effective use in Teaching and Learning

Considering its part of education in national advancement and the expansion in populace in schools nowadays, the utilization of computers in instruction and learning process get to be basic. This is on the grounds that its acceptance by educator will upgrade the system of instruction delivery to a better one. ICT will also help issues like effective classroom management, collaborative learning, self-study, course/subject organization, and enhance effective communication between peers, teacher and student-teacher. In today's modern day teaching, students partake actively and vigorously in the process unlike before where a teacher will stand in front of a class and giving lectures to students without them contributing to the subject or topic (Ajayi, 2008).

The different ICT gadgets utilized during instruction delivery and learning in schools and collages as indicated by Bamidele (2006), and Ofodu (2007) incorporate audio sets, TV, PCs projectors Optical fiber cables, Telephones, Mobile devices, Hand hold devices, Fax machines, Internet, Intranet, CD-ROM, PPT slides, electronic board, digital multi-media, video/VCD, DVD, machines etc. It creates the impression that some of these gadgets are not adequately accommodated teaching and learning in Nigerian government post primary schools.

According to Ajayi (2008) the utilization of these resources requires different techniques which incorporate systematic feedback framework, PC based operation/system, video and audio conferencing, LAN, www and Computer Assisted Instruction (CAI). It is ought to be emphasized that the viable utilization of these different strategies for ICT in instructing and learning depends to a great extent on the accessibility of these resources and the skill instructors have in utilizing them. The capacity to utilize PC viably has now turned into a basic part of each ones academic life. Disciplines like accounting, business management, clerical assistance, science, technology and engineering now constitute a special computerize packages such as word processor, spreadsheet, Corel draws, databases etc. (Raffel and whitworth, 2002, cited in Bala and Wakili, 2015). The demand of computer and ICT literacy is always raised as employees understood that keeping abreast with the new technology is best option for securing their jobs as the computer knowledge provide them with a maximum job security. The teaching and learning of these skills is now the talk of the day among even professionals. ICT applications in schools proved advantageous in empowering the learning system in Nigeria public schools and give the students a better education. Improving education is crucial to its formation of effective human capital in every nation (Evoh, 2007).

As innovation enhances instructional capacity likewise increments reliably. The development of modest PC innovation and mass storage media, for example, optical disc, cloud and so forth has given educators and instructional technologies superior devices with which to work. A PC computer memory nowadays counts in tera bytes which are used to store substantial quantity of information and data. As mentioned by Ajayi (2008), the viable usage of ICT in teaching relies heavily upon the accessibility of these gadgets to the instructors and the teacher's competencies in using them. Research has shown that the schools in northern Nigeria lack functional ICT facilities thus hamper the teachers' ability of using them. Other issues include inadequate teacher competency, irregular power supply, insecurity, and lack of fund.

2.8 Milestones in Using ICT in Nigerian Public Schools

The political condition in Nigeria for as far back as 30 years permits no space for progression and advancement. Over these period politicians in Nigeria have being using their offices to establish mediocrity, corruption in highest degree and misplace of priorities. The direct result of this is battered economy and continual decay in educational sector on a daily basis. In 1988, an attempt has being made to keep pace with the improvement in computer instruction in line with that, the country passed a law on computer education but unfortunately, the project has not gone past the conveyance and establishments of facilities in the federal government colleges. (Adowa-Ogiegaben, & Iyamu, 2005).

In mid-2003, at the Summit of African countries in South Africa, an international organization that concerns with the development of Africa known as the new partnership for African development (NEPAD) air marked a program called e-school initiative its aimed is to provide to all the post primary schools in African countries

with the ICT facilities including scanners, photocopiers, laptops, desktops, VSAT, printers, digital cameras etc. which meant interconnect all African schools to the internet. The project was to be executed in phases but still the projects turn to be an unsuccessful (Adinam, 2006).

In 2004, the federal government of Nigeria made a second attempt through the National ICT Policy on Education. Recognizing the significance of ICT in a contemporary world, the policy intended to incorporate the new technology in to its school curriculum. To make the dream a reality, the document stated clearly that the basic infrastructures and training facilities at the primary school level will be make available by the federal Government and computer education will be made a trade in vocational schools and also computer science education will be taught as an elective course in senior secondary school (Federal Republic of Nigeria 2004).

In 2006, the federal ministry of Education in Nigeria dispatched an ICT driven task known as SchoolNet. The project was intended to furnish all public schools in the country with computers and other ICT gadgets but still Nigerian public schools remain under chalk and black board and in more than 90% of the schools, the educational activities remain manual (Aduwa-Ogiegbaen and Nyamu, 2005).

Despite the fact that efforts have been made to ensure the accessibility and practical use of ICT facilities in public schools, still the level of compliance is low as must schools both private and public do not have ICT training courses (Goshit 2006).

Chapter 3

METHODOLOGY

This part talks about the research design, population and sampling strategies, and instruments used for data collection, data integrity and quality control, research procedure and the data analysis techniques employed in the study.

3.1 Research Design

Quantitatively driven approaches/designs is a method of study where by quantitative data are mainly used but qualitative data is also used along site to help in achieving a better result. The idea of using the both approaches simultaneously is to supplement and improve the quantitative approach by simplifying the more complex research questions (Johnson, & Christensen, 2014).

Quantitative research is an examination outline in view of customary scientific strategies, which produces scientific information and more often than not looks to make causal connections between two or more variables, utilizing measurable routines to survey the quality and essentialness of the connections. According to Slevitch (2011), quantitative research evaluates data to produce numerical information or information that can be changed into usable figures and numbers. It is uses well-defined quantifiable variables in which the result can be generalize in to a bigger and wider populace. The method also uses measurable data to formulate facts, ideas and uncertainties. Various forms of surveys techniques can be used to gather and collect data under this approach.

Survey simply means a research study design in which participants are ask to answer a certain questions. Survey can also be understood as a data collection tool commonly used in a research to gather information from individuals on a particular subject matter through their responses to questions. Survey research design also describes a given state of event at a particular time. The method uses questionnaires and/or interviews for the collection of data from a population based on appropriate sampling techniques. Survey research design is usually used in behavioral sciences especially in educational research. It provides information or data for further research in experimental studies. Survey research involves a clear definition of problems, collection of related and skilled or professional reporting of the outcomes after a watchful analysis and interpretation of the collected data. Best and Kahn (2006) stated that survey research characterized with an openly stated problem and a well-defined objectives which requires a watchful data collection, analysis, interpretation and logical reporting of findings by experts.

In the other hand, qualitative research concentrates on social event for the most part verbal information as opposed to estimations. Assembled data is then broke down in an interpretative way, subjective, or even analytic. Qualitative research uses both structured and non-structured interviews, archival research, document content analysis, participant observation and narratives as a data-gathering strategy where the data are usually presented in the form of words from interviews, images/videos or objects such as artifacts (Slevitch 2011).

3.2 Population and Sampling

The study was carried out among the students, teachers and administrators of the public secondary schools in the six (6) North-Eastern states of Nigeria. They include

Bauchi, Gombe, Yobe, Taraba, Adamawa and Borno States. According to 2010 Basic Education profile the facts and figures of public schools in North-East region Adamawa 397, Bauchi 411, Borno 244, Gombe 265, Taraba 277 and Yobe 143 respectively (Universal Basic Education Commission, 2010).

The total of 12 schools spread across the region were randomly selected and a total of 120 punctual and serious students were carefully selected. Among which 86 were males and 34 were females between the ages of 11-18 years which were considered a true representatives of their various schools. 3 punctual and dedicated teachers in each of the school were judgmentally selected. These gave a total of 36 which consist of 22 males and 14 females with ages ranging from 25 to 45 years with mean age of 35 years. 6 administrators were also interviewed so as to get data to support the responses from the students and teachers. As shown in the Table 3.1 below:

Table 3.1: Demographic of the respondents

| S/No | Schools | | | Students | | | Teachers | | | | Adm |
	Name	State	No. of Stdnts	M	F	Total	M	F	Ave. Age	Total	
1	Azare	Bch	10	6	4	10	1	2	35yrs	3	2
2	GDSS		10	7	3	10	2	1	35yrs	3	
3	High Sch.	Gmb	10	6	4	10	2	1	35yrs	3	2
4	GSSS		10	6	4	10	1	2	35yrs	3	
5	GDS Fk	Ybe	10	9	1	10	2	1	35yrs	3	1
6	GSS Ptk		10	9	1	10	2	1	35yrs	3	
7	SGSS	Brn	10	8	2	10	2	1	35yrs	3	0
8	Gvt Col		10	7	3	10	2	1	35yrs	3	
9	GDS Yl	Adw	10	8	2	10	2	1	35yrs	3	1
10	GSS Hg		10	7	3	10	2	1	35yrs	3	
11	Gvt Col	Trb	10	6	4	10	2	1	35yrs	3	0
12	Wukari		10	7	3	10	2	1	35yrs	3	
	TOTAL		120	86	34	120	22	14		36	6

The study was conducted in 12 public secondary schools selected at random across the 6 states of the north- east geo-political region in Nigeria. Nigeria obeys a six year secondary school policy (6:3:3:4 system). In terms of numerical strength, it was agreed upon maximum of 20 in pre-primary, 30 in primary and maximum of 40 in post primary schools Nigerian policy on education (Federal Government of Nigeria, 1977 Revised 1981, 1998 and 2004).

According to Hauwa (2012), the school management team consists of Principal, Deputy Principal Academic, Deputy Principal Administration, the various Heads of Departments in the school and sometimes the officials from the ministry of education. Based on the above the researcher assumed a population of 70 administrators for the 12 schools.

Table 3.2: Sample selections and categories of respondents involved

Categories	Sample sizes (n)
Students	120
Teachers	36
Administrators	6
TOTAL	**162**

10 students were randomly selected from each school giving the total of 120 students. 3 teachers were also selected from each school giving the total of 36. Again, 6 school administrators were randomly selected across the region giving the overall total sample of 162 as can be seen in the table above.

Teachers formed the part of the study as they are directly involved in the teaching and learning process. The administrators were considered policy makers and they play a significant part in the curriculum amendment in the public schools. The students were also considered true representatives of our population and they were the major target of this research work. Again Table 3.3 below gives the statistics of the sample based on gender.

Table 3.3: Statistics of the respondents by gender

Category	Gender	Sample Size	Percentage
Student	Male	71	59.2%
	Female	49	40.8%
Total		**120**	**100**%
Teacher	Male	22	61.1%
	Female	14	38.9%
Total		**36**	**100**%

Table 3.3 above gives the gender breakdown for both the students and teachers respondents. It can be seen that out of the 120 students only 49 were females representing just the 40% of the total students while their male counterparts took 51.2% with 71 respondents. The teachers also women take only 38.9% with the population of 14 whereas the men took 22 with 61.1%. The Table 3.4 below indicates the categories, class/department of the respondents and their respective samples.

Table 3.4: The category and department statistics of the respondents

Category	Class/Department	Sample Size	Percentage
Student	J.S.S 1 – 3	46	38.3%
	S.S.S 1 – 3	74	61.7%
Total		**120**	**100**%
Student	Art	39	32.5%
	Commercial	35	29.2%
	Science	46	38.3%
Total		**120**	**100**%
Teacher	Art	13	36.1%
	Commercial	14	38.9%
	Science	9	25.0%
Total		**36**	**100**%

In the Table 3.4 above, out of the 120 students that took part in the survey, 46 were from the junior classes level while 74 were from the senior classes corresponds to 38.3% and 61.7% respectively. Again among the students also 39 were from the arts, 35 were from the commercial and 46 were from the sciences this represent 32.0%, 29.2% and 38.3% of the total population. For the teachers, 13 were from the arts department, 14 from commercials and 9 from the sciences representing 36.1%, 38.9% and 25.0% respectively.

3.3 Data Collection Techniques

In this study, the primary data was gotten directly from the schools and was collected by the researcher through physical observations, questionnaires and interviews. In the other hand, secondary data was collected through document analysis such as official records and published information.

3.3.1 Questionnaires

A questionnaire simply means a mechanism for collecting and assembling data on a specific issue or topic of interest. It is also a way of knowing the emotions, experiences, opinions, or attitudes of selected individuals. Questionnaire could be an

open-ended which enables the respondent to reply in as much detail as they prefers in their own words. A closed-ended in the other hand, permits just answers which fit into classes that have been chosen in cutting edge by the researcher. The nature of questions in the sample questionnaire (closed or open ended) determines the type of the questionnaire either a structured, unstructured or in between that is semi-structured (Pillai, 2015).

The questionnaire was designed by the researcher with both open and close ended questions related to topic and the research questions raised. The open ended question where used to supplement the information collected from the closed ended questions so that to help in obtaining more accurate data.

According to Best and Khan (2006), described questionnaire as data gathering tool/instrument through which respondent answer question or respond to statements in written to enable them to express themselves freely especially those that may not have enough time to attend to personal interview.

The questionnaire consist three sections, the first section consist of 9 close ended questions mainly for students and the second section consist of 14 other close ended questions mainly for teachers. Another set of 6 unstructured questions were again provided as the last part which can be attempted by any respondent who wishes to express their selves further. So in all the questionnaire in this research work consist of 29 items which are directly related to the research questions. A total of 200 questionnaires were designed and dispatched across the 12 schools. 179 questionnaires were successful filled and return among which the required sample of 156 (120 students and 36 teachers) were screened for the research work.

Table 3.5: Questionnaire participation table.

Distributed Questionnaire	Returned Questionnaire	Percentage	Valid Questionnaire	Percentage
200	179	89.5%	156	78%

The researcher administers the questionnaires with the help of some staff from the selected institutions who guided the students on how to fill the questionnaires. The options from the questionnaires "NEVER", "RARELY", "SOMETIMES" and "ALWAYS" were represented by 1, 2, 3, and 4 respectively for easy analysis and computation. An introductory later was earlier written and send to the school management seeking permission to conduct the data collection exercise.

3.3.2 Interview

Another technique used to gather data in the course of this research work is interview. Interviews were suitable for administrators as they had no time to respond to questionnaires and again verbal interaction with them helped in detecting biased answers.

In the interview, the two parties can rub minds freely with limited or no restrictions which gives an opportunity to the interviewer to even broaden the discussion so that more detail information can be squeeze from the interviewee.

3.3.2.1 Interview Design, Implementation and Procedure

Interviews are usually design as open-ended questions in nature to offer additional rooms for both the researcher and the respondent for more discussion where the interviewer can throw more questions and the interviewee can express their selves according to their wish (Kvale & Brinkmann, 2009). In this study, the researcher interviewed the administrators regarding their opinions regarding the use of ICT in

their respective schools. The interview questions were earlier derived from the original study questions.

The interview was implemented and conducted with members of the school management team who are considered the administrators in their various schools and must of them were also staffs of the ministry of education. Gray (2009), suggested that extremely important that the consciousness of the interviewee should be clear and at ease before the commencement of the interview. This can be achieved by explaining in detail the reason for the interview, why the data is needed, who will use the data and where and how the data would be handled. In line with above advice, an appointment was booked by the researcher through secretaries and a face to face verbal discussion was conducted with two (2) of the respondents and a telephone talks was conducted with the remaining four (4) as the researcher could not meet them one-on-one. The researcher used pencil and paper to record the important points during the interviews.

3.3.3 Observation

Observation is way information is assembling by a mere physical watching an events or situations in their normal usual and natural settings with or without the knowledge of the participants. Observation is usually used simultaneously with other instruments such as questionnaire and/or interview in which this will help in collecting some sensitive data that cannot be collect otherwise (Liu & Maitlis, 2010).

During the period of data collection, the researcher seized this opportunity to physically witness what was going on in some of the schools for the utilization of ICT in instruction and learning. The researcher used the observation guide shown in Appendix A.

3.4 Data Collection Period and Procedure

For the purpose of this research work, data was collected within the period of two (2) months within which the questionnaires were sent for administration and was tested within the same period. Ten (10) students were picked at random (with the help of their teachers) from junior secondary school one (JSS1) to senior secondary school 3 (SSS3). At the same time, interviews were also conducted with the school management team to further understand the situation.

3.5 Reliability and Validity of Data

Reliability is an idea which indicates the proximity of two or more different but related items used collectively to determine the consistency of an instrument. To ensure the consistency of the tool used, a pilot study was conducted with 7 participants (5 students and 2 teachers) from Kofar Wambai Secondary School, Bauchi. Alpha Coefficient was calculated using SPSS as can be seen in the Tables 3.6 and 3.7 below for students and teachers respectively (see Appendices D and E. for the SPSS outputs).

Table 3.6: Reliability statistics (students Questionnaire)

Cronbach`s Alpha	N Items
0.65	9

Table 3.7: Reliability statistics (teachers Questionnaire)

Cronbach`s Alpha	N Items
0.66	13

An estimations of 0.70 or above for coefficient alpha were viewed as great, while values somewhere around 0.60 and 0.70 were additionally viewed as satisfactory and sufficient (Pallant, 2005).

3.6 Method of Data Analysis

Data collected was primarily presented by use of both quantitative and qualitative methods. The result obtained from the standard interview were coded and analyzed using the content analysis method while the responses from the questionnaire were computed and analyzed using descriptive statistics. The output was summarized and tabulated for easy presentation, assessment and interpretation using descriptive statistics as can be seen in the preceding chapter.

Chapter 4

FINDINGS

In this part of the thesis, the administered questionnaire by both students and the teachers as well as the interview result from the administrators are analyzed and the outcomes helped in responding to the study questions raised from chapter one.

4.1 The Students' Perceptions on the Availability and Usage of ICT Facilities in their Class Rooms

In regard to the study question one, Table 4.1 below shows the mean and the standard deviation on the students` general opinions on the availability and usage of ICT facilities in their schools derived from the questionnaire.

Table 4.1: Students` General Perceptions on the Availability and Usage of ICT Facility

Q/No.	Item	Mean	Std. Deviation
7	Uses of computers either in offices or classes	2.57	0.60
8	Bringing personal smart/digital devices such as phones, laptop and I-pad to the class	2.03	0.73
9	Being allowed to the computer room/lab for practical	2.73	0.63
10	Use of Photocopy machines scanner and printers	2.87	0.70
11	Computer Based Test (CBT) in exams	1.96	0.64
12	Use smart/white board in a class	1.45	0.60
13	Uses of e-mail or fax machine to send or receive messages	1.83	0.78

14	Use of free LAN internet within the school	1.12	0.32
15	Use of dedicated school web site which can be access from anywhere?	1.13	0.45

In Table 4.1 above showed that scanners, computers, photocopying machines are readily available and are being used considerably both in the classes and offices and at the same time students are allowed access to the computer rooms or labs. In the other hand, the use of digital devices, fax machines and CBT during exams are very rare with the highest mean value of 2.03 and the SD of 0.78. The use of smart boards and internet connection is reported to be absent completely in virtually all of the schools with the highest mean value of 1.45 and the SD of 0.60 respectively as can be seen in the figure below.
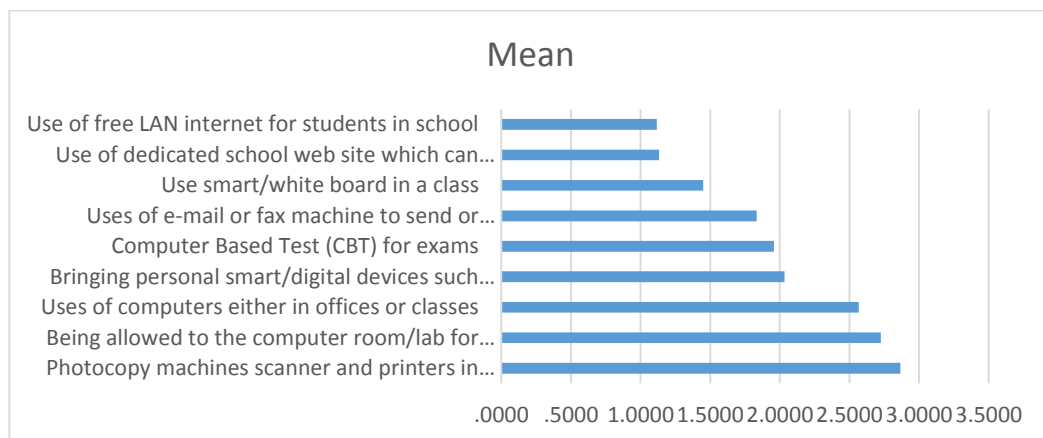
Figure 4.1: Students` General Perceptions on the Availability and Usage of ICT Facility

The findings from the similar research conducted by Apagu and Wakili (2015) in technical collage Yobe reveals that ICT facilities such as computer, television sets, CCTV, etc. are not adequately available in secondary schools and students level of exposure to the use of ICT in is very low. Aduwa-Ogeogbaen and Iyamu (2005) also gave similar assertion that Post primary institutions in the country were not given

satisfactory monies for chairs and desks, reading and writing materials, and research talk less of being given satisfactory monies for innovative types of equipment, for example, PCs and Internet availability.

4.1.2 Breakdown of the Usage and the Availabilities of Some Items According to Schools

To clarify more on the answer to the research question one, the table 4.1 above is hereby further analyzed by treating the available and inadequate items individually according to schools.

Table 4.2: Uses of computers either in offices or classes

Name of School	Mean	Std. Deviation
G.S.S Potiskum	2.00	0.61
Demonstration School Azare	2.91	0.30
Shehu Garbai Sec. Sch. Maidiguri	2.89	0.33
Government College Maidiguri	2.60	0.52
G. D. S. S. Old G.R.A Yola	2.55	0.69
G. S. S. Hong	2.56	0.53
Gombe High School	2.83	0.39
G.S.S.S Gombe	2.55	0.68
G. D. S. S. Army Barracks Bauchi	2.75	0.45
G.D.S.S. Fikka Yobe	2.13	0.64
Goverment Collage Jalingo	2.60	0.51
G.S.S Wukari	2.11	0.33

The Table 4.2 above gives the mean average of 2.56 of the total mean values which signifies a significance level of usage in the sampled schools. Except in G.S.S

Potiskum (Mean = 2.00, SD = 0.61), G.D.S.S Fika (Mean = 2.13, SD = 0.64) all in Yobe state and G.S.S Wukari (Mean = 2.11, SD = 0.33) in Taraba state respectively. This result corresponds with the findings of Austin (2015) who conducted a similar study in the same Taraba state concluded that all the seventeen ICT resources listed were available to a very poor extent. Only radio tape recorder were reported to be available but in moderate magnitude.

Table 4.3: Being Allow to Use Personal Smart/Digital devices such as Phones, Laptop or I-Pad to the class

Name of School	Mean	Std. Deviation
G.S.S Potiskum	1.75	0.89
Demonstration School Azare	1.82	0.75
Shehu Garbai Sec. Sch. Maidiguri	2.00	0.50
Government College Maidiguri	1.90	0.88
G. D. S. S. Old G.R.A Yola	1.82	0.98
G. S. S. Hong	1.78	0.97
Gombe High School	2.25	0.62
G.S.S.S Gombe	2.00	0.77
G. D. S. S. Army Barracks Bauchi	2.42	0.51
G.D.S.S. Fikka Yobe	2.13	0.64
Goverment Collage Jalingo	2.20	0.63
G.S.S Wukari	2.22	0.44

It can be seen from the Table 4.3 above that virtually there is an inadequate use and availability of the smart devices in the class room with an average Mean value of 2.03 and the average SD of 0.73. This is because not all the students can afford devices such as laptop but those that have are been allowed to used it in the class. According to Adomi (2010), the deteriorating economic situation and the weakness Nigeria currency against the dollar which made the prices of electronic devices to go high has made it difficult for most people and institutions to acquire computers and internet.

Table 4.4: Access to computer room/lab for practical

Name of School	Mean	Std. Deviation
G.S.S Potiskum	2.50	0.76
Demonstration School Azare	3.09	0.54
Shehu Garbai Sec. Sch. Maidiguri	2.44	0.53
Goverment College Maidiguri	3.00	0.00
G. D. S. S. Old G.R.A Yola	2.36	0.81
G. S. S. Hong	2.67	0.71
Gombe High School	3.00	0.74
G.S.S.S Gombe	2.82	0.60
G. D. S. S. Army Barracks Bauchi	3.17	0.39
G.D.S.S. Fikka Yobe	2.38	0.52
Goverment Collage Jalingo	2.40	0.52
G.S.S Wukari	2.56	0.53

The Table 4.4 above gives the mean value of 2.72 on average and an average SD of 0.55. These envisage a 100% access of students in to the computer rooms or

Laboratories for practical in all the schools studied. Although students' access to computer rooms and labs seems to be encouraging, but Hannatu, (2013) complained that our school curriculum has not given enough room for technology and students are not encourage to use computers as learning tools or as an independent course for study. Therefore, based on the above assertion, students don't have much to do with computer labs even if it's available and accessible to them.

Table 4.5: Use of Computer Based Test (CBT) for exams

Name of School	Mean	Std. Deviation
G.S.S Potiskum	1.38	0.52
Demonstration School Azare	2.09	0.54
Shehu Garbai Sec Sch Maidiguri	2.00	0.50
Goverment College Maidiguri	2.30	0.48
G. D. S. S. Old G.R.A Yola	1.55	0.52
G. S. S. Hong	1.44	0.52
Gombe High School	2.50	0.52
G.S.S.S Gombe	2.36	0.50
G. D. S. S. Army Barracks Bauchi	2.42	0.51
G.D.S.S. Fikka Yobe	1.88	0.64
Goverment Collage Jalingo	1.80	0.42
G.S.S Wukari	1.33	0.50

Table 4.5 above showed that the used of computerized exams in the schools is generally not encouraging with the total average mean value of 1.96 and an average SD of 0.64. Only 4 out of the 10 schools were reported to be using the CBT namely Government College Maidiguri (Mean = 2.30, SD = 0.48), Gombe High School (Mean = 2.50, SD = 0.52), G.S.S.S Gombe (Mean = 2.4, SD = 0.50) and G. D. S. S. Army Barracks Bauchi (Mean = 2.42, SD = 0.51). Whereas Demonstration School

Azare, Shehu Garbai Sec. Sch. Maidiguri, G.D.S.S. Fikka and Goverment Collage Jalingo reported to have been partially using the facility with the maximum Mean Value of 2.09. On the other hand, the remaining schools indicated non availability of the facility.

Mere observations showed that access to internet connection, stable electricity supply and lack of relevant software are the major factors militating the use of CBT in most of the Nigerian secondary schools especially those in the rural areas. The result obtained above was in line with the findings by Iduwo-Ogeogbea and Iyamu, (2005) who revealed that most dwellers in rural Nigeria have no access to electricity supply, thus denying schools in these areas access to any technology that requires electricity like computers and internet. They also added that the few Internet hubs available in Nigeria are located in towns and cities.

Stephen, (2013) in his research with physics teachers pointed out that none of the chosen computer packages utilized for the research was used in physics curriculum by the teachers. Arit & Su, (2015) discovered that participants in a given research felt that there was a lack of suitable software for national education in the country.

The findings from the above shows that with regards to the presence of computers and other related equipments, students that took part in this study testified that only the common ICT facilities such as Computers, Printers, Scanners and Photocopying machines were commonly available in most of the schools and it was concluded from the study that digital devices such as laptops, fax machines and the use of computer based test are rarely seen where as other facilities like smart/white board and other internet services were completely absents. And it is important to note that both the

accessibility and usage depends on the availability of the facility (Kiptalam and Rodriguess, 2011).

4.2 The Perception of Teachers and their Level Competencies in Using the ICT Facilities in their Teaching Profession

In this part, the responses to the items 12 to 23 (part ii) and 4 & 5 (part iii) of the questionnaire will help in answering the question above.

Table 4.6: Teachers` perceptions on the use ICT facilities

Item	Mean	Std. Deviation
Do you think ICT can develops student inquiry skills?	3.67	0.48
Do you think ICT can develops student' higher order thinking skills?	3.64	0.54
Do you think ICT can motivate student to work collectively in class?	3.61	0.55
Do you think ICT will encourage student in learning by doing?	3.56	0.61
Do you think ICT can encourage student to explore different channels in order to search for information?	3.64	0.64
Do you think in Public Secondary Schools in Northern Nigeria have enough ICT amenities in order to get benefit out of it?	1.92	0.28
Will ICT tools add to academic performance?	1.08	0.28

Table 4.6 above that teachers in the public secondary schools in northern Nigeria are highly confident (with an average mean value of 3.62) that the new technology will be beneficial not only to the teachers but the students as well. But, the mean value of 1.92 in the other hand indicates fear by the teachers that the inadequate ICT facilities will hamper the full benefit in teaching and learning. Similar research conducted by Arit & Su (2015) on the teachers` cultural perceptions toward the use ICT in teaching

indicated that the participants held positive views of ICT use and they viewed the web as a foreign learning tool and courseware not appropriate to norms and national values but could be adopted and modified.

Table 4.7: Teachers` competencies on the use ICT facilities

Q/No.	Item	Mean	Std. Deviation
01	Do you use Projector in every lesson?	1.33	0.49
02	Do you use digital video/audio recorder in your teaching?	1.78	0.72
03	Do you use computer systems for research or teaching in the classrooms?	3.06	0.67
04	Do you use power point as a teaching tool in your class?	1.67	0.76
05	Do you use tape of recorders to improve students listening skills?	1.64	0.59
06	Do you use smart phones, emails or fax to exchange information with parents/students while at home?	2.58	0.81
07	Do you use computerized database in exams and records department?	2.50	0.74
08	Do you use photocopy machine, scanners and printers?	2.98	0.71
09	Do you use smart/white board in your lesson?	0.93	0.38

Table 4.7 above has an average mean value of 2.05 any value below this is considered low usage and values above are considered high. The table indicates the various level of confidence of teachers in handling some of the basic ICT facilities. The table above shows that the instructors demonstrate high level confidence with the Mean values of 3.06, 2.58, 2.50 and 2.96 in computer operations, using smart phones, manipulating a computerized database and basic office equipment operation (photocopy machine, scanners and printers) respectively. While in the other hand, the

teachers demonstrate a low level of competence with the maximum Mean value of 1.78 in using projectors, digital video/audio devices, Microsoft power point, the use of tape recorders for oral teaching and using smart/white board. There seems to be improvements in this research compared to the study carried out by Abdul-Salaam, (2012) in Oyo state, Nigeria found out that more than half of the teachers cannot start a computer, only about 15% can work with MS word and less than 10% can use MS excel, MS access, browse the internet and use the computer to teach in class.

4.2.1 The Teachers Opinions on the Availability of these ICT Facilities and How Much they are Been Used

This section will try to answer the second part of the second research question outlined in chapter one above using the responses from the questionnaire.

Table 4.8: Teachers` general opinion on the availability of ICT facilities.

Q/No.	Item	Mean	Std. Deviation
01	Presentation software such as power point	1.67	0.76
02	Overhead Projectors	1.33	0.48
03	Photocopiers Scanner and Printers	2.87	0.70
04	Computer Room/Lab	2.73	0.63
05	Computers for Research	2.57	0.60
06	Personal Laptop and other digital mobile devices	2.03	0.73
07	Computer Based Test (CBT) software	0.36	0.64
08	Digital Video or Audio	1.78	0.72
09	Smart/White Board	0.65	0.59
10	Database software such as Access and Excel	2.50	0.74
11	LAN or Internet	0.52	0.32

The Table above has an average mean value of 1.73. Values below and above are considered inadequate and available respectively. While values within the average are considered inadequate. It can be seen from the table according to teachers that ICT facilities that are readily available include Photocopiers Scanner and Printers (Mean = 2.87, SD = 0.70), Computer Rooms/Labs (Mean = 2.73, SD = 0.63), Computers for Research (Mean = 2.57, SD = 0.60) and Database software such as Access and Excel (Mean = 2.50, SD = .74). ICT facilities such as Presentation software such as power point, Personal Laptop and other digital mobile devices, Computer Based Test (CBT) software, and Digital Video or Audio inadequately available with the maximum mean value of 2.03. In the other hand, Overhead Projectors, Smart/White Board and LAN or Internet are virtually not available in all the schools. As can be seen in the figure below:
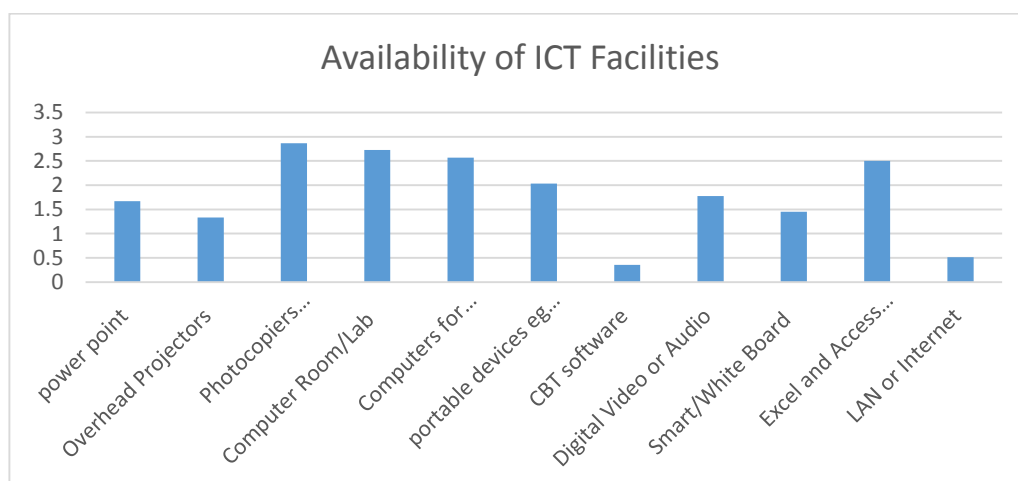
Figure 4.2: Teachers` General Opinion on the Availability of ICT facilities.

This confirms the observation of Abdul-Salaam (2012) and Amuchie (2015) who also found that among the collages studied in their separate researches none uses smart boards, multimedia teaching aids or e-library and all other ICT resources received responses less than 20% availability rate. Again according to the interview with one of the school administrators narrated that corruption and insecurity

45

contributed significantly to none availability of ICT facilities in the schools as narrated by administrator A:

most of these facilities were either burnt down or destroyed by the militants.

4.2.2 The Teachers Opinions Regarding the Policies and Interventions toward the Use of ICT in Schools

This section will try to answer the third part of the second research question given in chapter one using the teachers` responses from the questionnaire.

Table 4.9: Teachers` Opinion on the ICT Policies and Interventions According to schools.

Name of School		Are you aware of any Government policy with respect to the use of ICT in your school?	Do your school have any Intervention either from Government or any NGO in terms of ICT facilities?	Have you ever been sponsored either by Government or the school to take part in any ICT related courses?
G.S.S Potiskum	**Mean**	**2.67**	**2.00**	**2.00**
	SD	0.58	0.000	1.00
Demonstration Secondary School Azare	**Mean**	**2.67**	**2.33**	**1.67**
	SD	0.58	0.58	0.58
Shehu Garbai Sec. Sch. Maidiguri	**Mean**	**2.33**	**2.33**	**2.00**
	SD	0.58	0.58	0.00
Goverment College Maidiguri	**Mean**	**2.67**	**2.33**	**1.67**
	SD	0.58	0.15	0.58
G. D. S. S. Old G.R.A Yola	**Mean**	**2.00**	**2.33**	**2.00**
	SD	1.00	0.58	0.00
G. S. S. Hong	**Mean**	**2.00**	**2.33**	**2.00**
	SD	1.00	0.58	0.00
Gombe High School	**Mean**	**3.00**	**2.67**	**1.33**
	SD	0.00	0.58	0.58
G.S.S.S Gombe	**Mean**	**2.33**	**2.33**	**1.67**

		SD	0.58	0.58	0.58
G. D. S. S. Army Barracks Bauchi	**Mean**	**3.00**	**3.00**	**2.00**
	SD	0.00	0.00	0.00
G.D.S.S. Fikka	**Mean**	**2.00**	**2.33**	**1.00**
	SD	1.00	0.58	0.00
Government Collage Jalingo	**Mean**	**2.67**	**2.67**	**1.67**
	SD	0.58	0.58	0.58
G.S.S Wukari	**Mean**	**2.33**	**2.33**	**1.67**
	SD	0.58	0.58	0.58

In Table 4.9 above the average mean value of 2.48 indicates that the public schools teachers in north eastern Nigeria are partially aware about the government educational policies on the use of ICT in education. The table also shows the average mean value of 2.42 indicated that the ICT facilities donated to the schools is relatively low because all most everything is done by state governments alone. Again the table indicated that teachers are rarely sponsored for ICT training either by government or any organization with the max mean value of 2.00 and SD of 0.58. As displayed in the figure below:
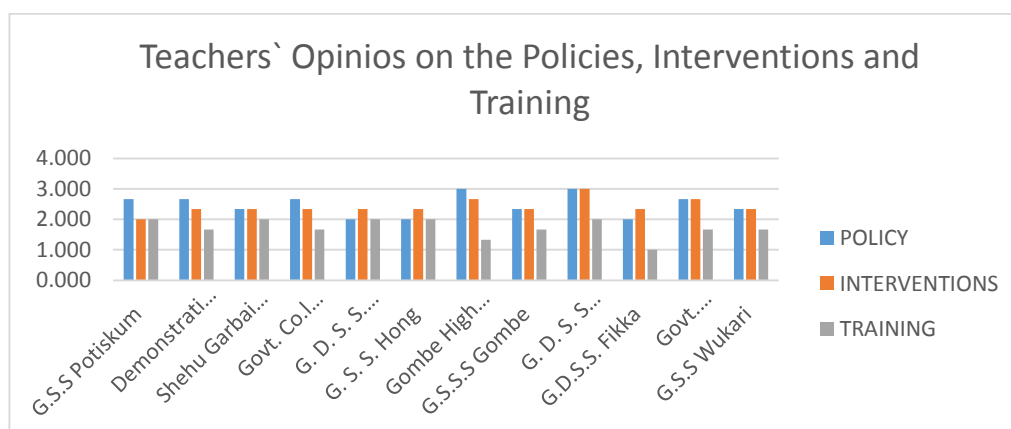
Figure: 4.3 Teachers` Opinion on the ICT Policies and Interventions According to schools.

It was clearly understood from the above findings that teachers in the north eastern Nigeria were aware about the government policies in regards to the use of ICT in

public schools although according to respondents the implementation is very poor this may not be unconnected poor government attitudes and the security challenges in the area which over shadowed other many other activities. Teachers again lamented that interventions in terms of facilities and staff training were also not promising this is in line with the findings of Aduwa and Iyamu, (2005) lamented that the 2004 Nigerian policy on ICT in education was succeeded only disbursement of PCs to some collages in the country.

The acceptance and integration of the new technology in Africa secondary schools in general seems to be moving to the next level. The system appears to be the changing from the era of trial piloting by private bodies to the functional systems supported by government policies and regulations. According to Farrell and Shafika (2007), there are numerous intervention projects going on in most of the African countries such as One Laptop per Child (OLPC), CISCO Networking Academy program etc. But observation shows that in Nigeria the projects seems to be one sided as some part of the country were not enjoying these projects all the interventions were from the state government alone. This assertion coincide with the interview with one of the school administrators when asked about the interventions either from individual, groups or non-governmental organization he testified that:

> no there is no such project in my school, if they do it somewhere in the state i have no idea.

The response from the above administrator shows that these projects are not everywhere.

4.3 The Opinions of Administrators Regarding the use ICT in Teaching and Learning

Here the researcher used the qualitative data obtained from the interview to provide answer to the third research question.

The interviews was conducted in two major ways. Firstly, the researcher interviewed 4 school administrators using face to face method and 2 staff of the ministry of education telephone method.

Here we consider interview questions according to their relevancies to the research questions, interpret the data and answer the questions. The responses from the interview questions 5, 6 and 7 help in answering the above question as can be seen below.

When the school administrators were asked about their opinions on the use of ICT in national exams, their responses was unanimously negative. According to the respondents this is due to the low level of students' exposure to computers in their learning activities and the inadequate ICT felicities in their schools. Administrator A describes the situation as:

> It is going in a very slow pace due to the insufficient orientation of computer usage by our students as part of their curriculum.

Some interviewees accepted the fact that CBT is good but their schools are not ripe for that yet considering the position of our students in terms of computer awareness. This was narrated by administrator B which says:

the use of online in national exams is a welcoming policy/idea but the state is currently not fitted for it because of the little knowledge our students have in computer and our schools do not have the needed facilities.

This is in line with the finding of Apagu, and Wakili (2015) which reported that the level of acquaintance to computers for both staff and students in secondary schools is inadequate.

The interviewees were asked if they have ICT department in their ministries that oversees ICT affairs in schools. The responses to this question are almost similar in a sense that no state has a dedicated department that oversees the use of ICT in the schools. Although in some states the ministry use to partner with another ministry or agency in respect to that regard. Administrator C explained that:

the ICT department in the ministry education sometimes help advices but this i not their primary duty.

Administrator D also said:

no we do not have but we sometimes collaborate with other agencies to organize workshops and trainings for both teachers and students.

The remaining responses indicated that there is no any department dedicated for that purpose ICT and computer studies. All subjects are treated equally and are control by the curriculum unit in the ministry of education. Again, computers are distributed to the schools (if available) like any other teaching and learning facilities from the procurement and supply department. This was explained by administrator E which says:

Purchase of computers like any other items are control by the logistics department and all other academic issues are handled by the curriculum development unit.

But this is contrary to the findings of Farrell and Shafika (2007) which pointed out that some African countries including Nigeria have decentralized ICT policies in education where state and provinces also took part of the responsibilities.

When the administrators were asked about their hopes with respect to the use of ICT in education generally. All the respondents are optimistic in answering this question they explained in various terms that using ICT in teaching and learning will have positive impact on students' performance and will help them in future to stand for better access for employment after graduation. This was narrated by administrator F:

> if properly integrated, every graduate of a public school will become computer literate figure and this will help them in securing a better job.

Administrator G again, expressed hope by saying:

> we are hoping that in a short time, there will be a great benefit in the educational sector where our students will have a sound knowledge. The use of ICT in the educational system would grow and achieve its goal looking at the framework set by the present administration.

It can be observed from the responses above that the administrators are with the opinion that the new technology hold a great promised for the educational development but they are in the belief that the schools in the north east are not prepared for this development now considering the inadequate ICT facilities and resources, good policy implementation and trained teachers. Jude and Dankaro (2012) attributed this failure to the higher institutions of learning such as Universities, Polytechnics and more particularly the collages of educations that failed to train their graduates on how to use the new technology who subsequently end up in a classrooms.

4.3.1 The Views of the Administrators about the Policies and Interventions either by Government, Private or Individuals

Here responses from the interview questions 1, 3 and 4 were analyzed to answer the research question above.

It can be recalled from chapter two that in 1998 Nigerian government in enacted a national policy on Computer Education which aims at introducing the use of Computer in Education. Again, in 2004, the federal Government also introduced a National Policy on Education which integrates ICT in education in Nigerian schools. When the administrators were asked about these policies and any other ICT intervention, large number of respondents to this question narrated in different terms that the implementation of ICT policy is poor some even went further to say that they were not sure if the said policy still exist. It was gathered from the number of interviewees that poor implementation of the policy is attributed heavily to the lack of political will, corruption and insecurity in the region as narrated by administrator H:

> There has been poor implementations of those policies due to the insecurity in the northeastern states and lack of government commitments.

Other common responses include government negligence and poor ICT facilities. Adomi and Kpangban, (2010) advocated that the policy document states that government will intervene in both training and equipments from the basics to upper secondary levels as both compulsory pre-vocational to elective course. But as stated by Adomi and Kpangban, (2010) the ICT policies in Nigerian public schools have not gone beyond the piloting stage. This statement seems to be factual because Farrell and Shafika (2007) also confirmed that although ICT is now at the center of educational reform all over the world but not all countries are currently able to fully

integrate ICT in to its education system. indeed observations shows that Nigeria is one of these countries as narrated by Amuchie (2015) who visited a number of government owned institutions in his research domain and indeed some schools in other areas on teaching practice supervision his encounters show that there is no significant sign that this proudly government policy has been implemented even in a states that that claims education is there biggest industry.

It was gathered from the literatures that the major telecom operators in Nigeria (MTN) also have a project called "MTN SchoolConnet" which aims at addressing the severe digital infrastructure problems on schools in some selected states in Nigeria. It was again gathered from the interviewees that the MTN SchoolConnet project is not everywhere and must of the schools were not even aware of the project as explained by administrator I who stated that:

> There is no such project in my school, if they do it somewhere in the state i don't know.

But some schools benefited only that there were complains on the present conditions of the facilities installed and status of the project itself as testified by administrator J:

> my school was among the beneficiaries but this project is just a history now because of lack of maintenance all the installations have damaged.

Observations revealed that MTN SchoolConnet project is not the only ICT intervention in African secondary schools. Other international projects such as World Computer Exchange, Digital Links, Computer Aid etc. But it is observed that in Nigeria especially in the northern part where western education is not a serious business such projects are not present. This is observed in the Nigerian Computer Society (NCS) annual National secondary schools ICT quiz competitor where

schools in the southern part of the country and the capital city Abuja perform incredibly well compared to their counterparts in the north. (www.ncs.org.ng).

On the issue of policies, administrators were asked if they have any policy at the state levels apart from those of federal government. this question must of the respondents testified that their states do not have any policy regarding the use of ICT in their schools they all depend on the federal government policies which was not even fully functional.

This was narrated by administrator K who says:

> no, all policies are those from the federal government and NGOs which are not even properly working but we are hoping that in a near future the state will have her own set of policies.

But the response is different in one of the states where the administrator testified that the state government is making efforts saying that:

> yes there are some programs established by the state government aimed at expanding educational/vocational opportunities through ICT and we are making progress.

According to Farrell and Shafika. (2007). Nigeria is among the countries that have a decentralized approached or shared responsibilities with states in terms of implementations and integration of ICT policy in education this help in propagating these policies at the state levels. But from the results of the interview above it's clearly that states especially those in the north do not make any effort to that regard. All the policies and projects are mainly from the federal government which various research shown that they are not properly working.

4.3.2 The Opinion of the Administrators on the Availability of ICT Facilities in Public Schools

Responses from the interview question 2 is analyzed the opinions of the administrators on the availability of ICT facilities in public schools.

The federal ministry of education in 2006 lunched an ICT driven project kwon as SchoolNet which was intended to equip all Nigerian schools with computers and communication technologies (www.snng.org).

In line with the above effort, administrators were asked either they benefited from this project. Overwhelmingly, the responses to the question is much related to the previous one. The two questions go hand-in-hand in a sense that the first one focuses on government policy while the second question focuses on the provision of ICT facilities by the same government to the public schools. In addition, this question make further enquiry on the sources of ICT facilities to the schools apart from government (if any). It was learned from the interview that up course some schools benefited from the project only that the facilities were not adequate enough and in some areas the facilities were either vandalized, looted or destroyed during crises especially in the north east region. When administrator M was asked about the availability, he stated that:

> must of these facilities were either burnt down or destroyed by the militants during crises because there is no enough security in most of our schools.

This is in line with the called by UNESCO to the Nigerian Government to provide more security and improve training on safety and security of schools in northeast Nigeria (www.unesco.org).

On the issue of acquisitions, the respondents testified that government is the major source of their ICT facilities although private organizations and school authority sometimes helps but is very rare. This was confirmed by administrator N when asked about how they acquire the needed ICT facilities. His response was that:

> The state governments are the major sources where we acquire ICT facilities, school authorities sometimes buy but with the permission from the same government.

This is in agreement with the Adowa-Ogiegaben, and Iyamu, (2005) who expressed disappointment that the project has only succeeded in computer installations not even in state owned schools but federal collages which are limited. This testified the statement above that ICT facilities are provided by the state governments only and considering the economic situation in Nigeria it is difficult for the state governments to cater for all the schools. Other common responses to that question was that more security should be provided to secure the facilities. Indeed the availability of the resources can only be guaranteed when they are properly secured.

Chapter 5

CONCLUSION

From this research work, it was concluded that information and communication technology amenities are not readily obtainable in the public post primary institutions in the Northeastern Nigeria and the level of application of such technologies in teaching and learning activities is very low. The study revealed that teachers lack the skills in using most of the ICT facilities. It is clear that the education sector of Northeastern Nigeria and the country at large has no smooth running education system. In fact, all levels of education are overwhelmed with list of problems ranging from underfunding to mismanagement. If the educational sector throughout the region is to maintain maximum standards, it should be provided with adequate funds, adequate security, ICT infrastructural facilities in term of modern classrooms equipped with electronic computer systems which are connected to the internet and highly qualified staffs that can effectively utilize these resources.

Regarding the first research question which is about the perceptions of students toward the use of ICT are in general and their opinions on the availability and the usage of these facilities in their class rooms. It was concluded that students in areas where this research was carried out are hopeful and confident that integration of ICT into their curriculum will help tremendously but unfortunately, results from this study and other similar research works signposted that ICT facilities in most of the Nigeria public schools are in short supply especially in the rural areas where basic

social amenities were also a problem. It was again found from the research that in some schools especially those in the cities have only the common ICT facilities such as computers, printers and sometimes audio devices but the high tech facilities such as internet were not available.

Responses from the teachers with respect to answers to the research question two indicated that teachers were optimistic that the new technology if properly used will enhance development not only on improving the students learning process but will at the same time ease and streamline the teaching practice thereby uplifting the national standard of education. But in the other hand teachers expressed doubt and fear on weither the new technology can add value to the present academic performance of our students considering the poor ICT facilities and resources on the ground. On the issue of teachers' competencies, the teachers displayed various levels of confidences in using those facilities available to them because one can only have access to what is available. It was seen from them result that most of the teachers can work with computers, printers, photocopying machine and sometimes uses programs such as MS word, MS excel and MS access for academic purposes. Regarding the policy implementations and interventions from private and non-governmental organizations, the findings shows that teachers are aware of the federal government policy on integrating ICT in education which was considered by many as a failure. In terms of intervention, it was testified by both the teachers and the administrators that virtually all the efforts were done by states governments which was believed that cannot carter for all the schools due to its limited budget.

Finally, it was concluded that the school administrators condemned in strong terms the level of implementation of National educational policies on ICT and the

executions of interventional projects. They are also with the opinion that government is doing her best on the availability of these facilities and they attributed the negative developments to the lack of basic social amenities, insecurity, lack of external support and poor policy implementations.

REFERENCES

Falola, T. (2011). Africa, Empire and Globalization. Essays in Honor of A. G. *Hopkins*, Carolina *Academi Press, Durham, NC (2011)*.

Evoh, C. J. (2007). *Policy networks and the transformation of secondary education through ICTs in Africa: the prospects and challenges of the NEPAD e-Schools initiative.* International journal of Education and Development using information and communication technology (IJEDICT) 3 (1), 64-84. Retrieved from http://www.ijedct.dec.uwi.edu/include/gedoc.php.

Rosen, L., & Michelle, W. (1995). Computer availability, computer experience and technophobia among public school teachers. Computer in human behavior. Retrieved from http://www.ifets.info/journals/8_1/13.pdf

Poole, G. A. (1996). A new gulf n American Education, the digital divide. *New York times journal, 29.* Retrieved from http://www.world-educationcenter.org/index.php/wjet/article/

Burnett, G. (1994). Technology as a tool for urban classrooms. *ERIC/CUE Digest, 95, New York: Eric Clearing house on Urban Education*. Retrieved December 21, 2004, from http://www.ericdigsts.org/1994/tool.htm.

Fitzgerald, G., & Werner, J. (1996). The use of the computer to support cognitive behavioral interventions for students with behavioral disorders. *Journal of Computing in Childhood Education*, 7, 127-48.

Bamidele, S. O. (2006). Development of modern ICT and internet system. In Agagu A.A. (ed). *Information and communication technology and computer applications. Abuja; pamof pree pp. 1-3.*

Jimoh, A. T. (2007). *Students` attitudes toward ICT in Nigeria institutions. Education focus 1(1): 73-79.*

Ofodu, G. O. (2007). *Nigerian literacy educators and their technological needs in a digital age. Eduction focus 1(1): 22-30.*

Ajayi, I. A. (2008). Towards effective use of information and communication technology for teaching in Nigeria colleges of education. *Asian J. mf.techno 7(5)*: 210-214.

Fedeal Repblic of Nigeria, (2004). National policy on education 4th editon. Lagos, Nigeria Educatonal Research and Development Council.

Okebukola, P. (1997). Old, new, and current technology in education. *UNESCO Africa 14* (15): 7-18.

Apagu, V., V. & Wakili B., A. (2015). *Availability and Utilization of Ict Facilities for Teaching and Learning of Vocational and Technical Education in Yobe State Technical Colleges.* American Journal of Engineering Research (AJER), e-ISSN : 2320-0847 p-ISSN : 2320-0936 Volume-04, Issue-02, pp-113-118

Retrieved from http://www.ajer.org.

WikiWducator, free learning content.

    From https://www.wikieducator.org/ComputerAssistedInstruction(CAI).

WikiBooks

    Retrieved from https://en.wikibooks.org/wiki/ICT_in_Education/Definitions

WhatIs.com

    Retrieved from http://whatis.techtarget.com/definition/computer-based-

    training-CBT

Kuter, S., Gazi, Z., A., & Aksal F., A. (2012). Examination of Co-construction of

    Knowleagde in Videotaped Simulated Instruction. Educational Technology &

    Society, 15(1), 174-184.

Katapang, B. (2012). The Beauty of Katapang.

    From http://rurinoktavianysumarno.blogspot.com.cy/2012/05/behavior-

    cognitivism-and-constructivism.html

Abik, M., & Ajhoun, R. (2012). Impact of Technological Advancement on

    Pedagogy. *Turkish online journal of distance education (TOJDE), 13(1).*

George S. (2005). *Connectivism: A Learning Theory for the Digital Age*.

    Retrieved December 12, 2004, from http://www.connectivism.ca/

Patrick. B. (2013). The International HETL Review, Special Issue. ISSN: 2164-3091

    2013 HETL Conference, Orlando, Florida, USA

Downes, S. (2008). Connectivism: Learning theory of the future or vestige of the past? The international review of research   Vol 9, No 3 (2008).

Silva, E. (2008). *Measuring skills for the 21st century*. Washington, DC: Education Sector.

Retrieved from http//:www.educationsector.org/usr_doc/MeasuringSkills.pdf

Sherrelle, M. A. (2012). 21st Century Learning: Preparing Students Today. Retrieved Aug 28, 2012 from http://www.scilearn.com/blog/21st-century-learning-preparing-students-today.

Williams, K. (2010). Using information technology: A practical introduction to computer and communication. *J. Science Teach. Nig., 4*(1), 174-180.

Wodi, S., & Dokubo, A. (2008). The relevance of ICT in Science and technology. *J. Curr. Organ., 13*(1), 160-166.

Stephen, U. S. (2013). Availability, Accessibility and Utilization of Information and Communication Technology in Physics Teaching in Akwa Ibom State, Nigeria, West Africa. Utibe-Abasi Sceptre Stephen, Department of Science Education, University of Uyo, Uyo. Akwa bom State, Nigeria. Tel: 234-809-138-2445. E-mail: utibeabasistephen@yahoo.com

Nwosu, A. (2009). Effects of Computer–Assisted Instruction (CAI) with drill and practice on academic achievement of students in physics. *Nig. J. Science and Science Edu., 8*(2),72-86.

Okwo, F. (2006). Communicating STM with New Media: Status and implications*STAN 39th Annual Conference Proceedings on Communication STM* (pp. 80-82). The Shell Petroleum Company of Nigeria Ltd. World Bank (2002) Information and Communication Technologies: A World Bank Strategy Washington United States Education Report.

Cirfat, A., Zumyil, C., & Ezemma, M. (2006). The states of ICT in Colle*ges.* In M. A. G. (Ed.), STAN 44th Annual Conference Proceeding on Information and communication Technology (pp. 48-52). Ibadan: Heineman Educational Books.

Eroha, K., & Ekweme, C. (2007). Assessment of Teachers level of literacy and Attitude towards information and Communication Technology (ICT) Application in STM Education. *STAN 44th Annual Conference Proceedings on Information and Communications Technology* (pp. 14-17). Ibadan: Heinmann Educational Books.

Idoko, J., A. & Ademu, A. (2010). The Challenges of Information and Communication Technology for Teaching –Learning as perceived by Agricultural Science Teachers in Secondary Schools in Kogi State. *Journal of Educational Innovators.* 3 (2).43-49.

Adomi, E., E. & Kpangban, E. (2010). Application of ICTs in Nigerian Secondary schools. *Library Philosophy and Practice* 2010. ISSN 1522 – 0222. Retrieved from http://www.digitalcommons.unl.edu/libphilprac/345

Abdul-Salaam, A. O. (2012). *Assessment of secondary school teachers' use of information and communication technology (ict) in oyo metropolis of oyo State*. Proceedings of the 1st International Technology, Education and Environment Conference (c) African Society for Scientific Research (ASSR).

Fakeye, D. O. (2010). Assessment of English Language Teachers' Knowledge and Use of Information and Communication Technology (ICT) in Ibadan Southwest Local Government of Oyo State. *American-Eurasian Journal of Scientific Research.* 5 (4).56-59.

Oyejola, T. (2007). The Extent of Utilization of Computer in the Teaching and Learning of English language in Selected Private Secondary Schools in Ibadan. Unpublished (M..Ed) Project.

Kiptalam, G., K. & Rodrigues, A., J. (2011) Accessibility and Utilization of ICTs among secondary school teachers in Kenya. Retrieved from tpJLcit.rnakccir' 20th, August, 2012.

Amajuoyi, J. J. (2012). Towards effective integration of information and communication technology in universal basic education: issues and challenges to ST in education. *journal of 52 annual conference of science teachers association of Nigeria* 2012. HEBN publishers' plc.

Ahmad, J. (2010). Media Technology and English Language Teaching.: *International Journal of Research in all Subjects in Multi-language*, vol.2 issue 2.

Yunus, M., Salehi, H. & John, D., S. (2013). Using Visual Aids as a Motivational Tool in Enhancing Students' Interest in Reading Literary Text. From http://www.arxiv.org/ftp/arxiv/papers/1305/1305.6360.pdf.

Sweeny, S. M. (2010). Writing for the instant messaging and text messaging generation: using new literacies to support writing instruction. J. Adolesc. Adult Lit. 54(2) pp 121-130.

Amuchie A. A. (2015). *Journal of Poverty, Investment and Development*, ISSN 2422-846X An International Peer-reviewed Journal Vol.8, 2015.

Adowa-Ogiegaben, S., E. & Iyamu, E., O. (2005). Using information and communication technology in secondary schools in Nigeria. Educational technology & society 8 (1), 104-112.

Adinam, E. (2006). Nepad scores students' ICT education Africa low. Vanguard. Fromhttp://www.Vanuardngr.com/articles/2002/features/technology/tec527206. html.

Goshit, T. (2006). Nigeria's need for ICT: SP. 259 technology and policy in Africa. From: http://www.ocw.mit.edu/NR/rdonlyres/SpecialPrograms/SP-259Spring-2006/891209EE-E63B-4617-BA9D/goshit.pdf.

Johnson, R., B. & Christensen, L., B. (2014). Educational research:　quantitative, qualitative, and mixed approaches (5th ed.). Los Angeles, CA: Sage.

Babbie, E. R. (2010). *The Practice of Social Research*. 12th ed. Belmont, CA: Wadsworth Cengage, 2010.

Slevitch, L. (2011). Qualitative and quantitative methodologies compared: Ontological and Epistemological Perspectives. *Journal of Quality Assurance in Hospitality and Tourism,* 12, 73-81. doi: 10.1080/1528008X.2011.541810.

Best, J., W. & Kahn J., V. (2006). Research in education. United States of America: *Pearson.*

UBEC. (2010).Universal Basic Education Commission, Basic Education Data Reports, Retrieved from http//:www.ubeconline.com

Ekereke, A., S. (2013). "The Effects of Boko Haram Insurgency and the School System;A Case Study of Selected States in Northern Nigeria" Volume 2013, Article ID sjsa-137, 5 Pages, 2013, doi: 10.7237/sjsa/137.

Central Bank of Nigeria. (2010). Statistical bulletin. Abuja, Nigeria: Federal Government Press.

Akindele, I., M. (2012). International Journal of Learning & Development ISSN 2164-4063 2012, Vol. 2, No. 5.

Hauwa, I. (2012). Educational Policy in Nigeria from the Colonial Era to the Post-Independence Period, Italian Journal of Sociology of Education.

Pillai, R. (2015). ResearchGate.

From http://www.researchgate.net/profile/Rajasekharan_Pillai.

Gray, D. E. (2009). *Doing Research in the Real World*, California: Sage Publications Ltd.

Kvale, S., & Brinkmann, S. (2009) Interviews: Learning the craft of qualative research interviewing, 2nd edition, London, UK: Sage Publications Ltd.

Liu, F., & Maitlis, S. (2010). Nonparticipant Observation. In Albert J. Mills,

Hannatu, A. (2013). The role of ICT in teaching science education in schools. *International Letters of Social and Humanistic Sciences Vol. 19 (2014) pp 217-223*, © (2014) SciPress Ltd., Switzerland. From http//:www.scipress.com/ILSHS.19.217

Arit, U., & Su, L., W. (2015). Teachers' Cultural Perceptions of ICT in Nigerian Schools, *International Journal of Education and Training* (InjET) 1(1) June: 1-12 (2015). From http://www.injet.upm.edu.my.

Farrell, G., & Shafika, I. (2007). Survey of ICT and Education in Africa: A Summary Report, Based on 53 Country Surveys. Washington, DC: infoDev / World Bank. From http://www.infodev.org/en/Publication.353.html.

Jude, W., I. & Dankaro, J., T. (2012). ICT Resource Utilization, Availability and Accessibility by TeacherEducators for Instructional Development in College

of Education katsina-Ala New Media and Mass Communication, ISSN

2224-3267 (Paper) ISSN 2224-3275 (Online), Vol 3, 2012.

From http//:www.iiste.org.

Nigerian Computer Society. (2015). National Information Technology Whizkids

Competitions 2015.

From http://www.ncs.org.ng/national-information-technology-whiz-kids-

competition.

UNESCO Report. (2014). UNESCO workshop training on school security.

From http://www.unesco.org/new/en/memberstates/singleview/news/unesco

APPENDICES

Appendix A: Observation Guide

1= Not available 2 = Poor 3 = Very poor 4 = Good 5 = Excellent

S/No.	ITEM OBSERVED	RATING				
1	Uses of **Computers** either in offices or in classes	1	2	3	4	5
2	Uses of **Smart/Digital devices** such as **phones, laptop** and **I-Pad** in the class.					
3	Uses of **Computer Room/Lab** for practical.					
4	Uses of **Photocopy machines, Scanner** and **Printers** in their offices.					
5	Uses of **Computer Based Test (CBT)** for exams.					
6	Uses of **Smart/White Board** in class rooms.					
7	Uses of **Email or fax machine** to send and receive messages by teachers.					
8	Uses of school **free LAN internet** for students and teachers.					
9	Sources of **ICT** facilities to the school.					
10	Uses of **projector** in during lesson.					
11	Uses of **Digital Video/Audio Recorder** while teaching.					
12	**ICT training** for teachers					

Appendix B: Introductory Letter

Abubakar Abubakar MOHAMMED,
(MSc. Student)
Eastern Mediterranean University,
North Cyprus.
Computer Education Department,
Mobile: +905338416034, +2348065864188.
Email: abbakar79@gmaill.com

"AN ASSESSMENT OF THE USE OF ICT IN TEACHING AND LEARNING IN SOME SELECTED PUBLIC SECONDARY SCHOOLS IN NORTH-EASTERN NIGERIA."

Dear Respondent,

It's generally believed that ICT can empower teachers and learners, promote change and foster the development of 21st century skills in education.

The purpose of this questionnaire is to find out students and teachers 'views on the use of ICT in public secondary schools for the development of Educational System in North-Eastern part of Nigeria.

Data gathered from the findings, will guide me to reach a conclusion about the *use* of ICT in our public secondary schools and possible solutions will be suggested to the Governments/authorities of the affected States for further necessary action.

As a researcher I would appreciate a lot if you could fill in the questionnaire which will only take **10 minutes** and hand it back to your teacher

If you have any questions feel free to ask your teacher. Moreover, the result of the data given will be handled confidentially and will not be used in any other research or the administrative part of the school.

Thank you for your time and genuine responses.

Appendix C: Sample Questionnaire

PART I

Instruction: Please tick (√) as appropriate as it concerns you:

1. **Gender:** Male ☐ Female ☐

2. **Category:** Student ☐ Teacher ☐ Non-Teaching Staff ☐

3. **Age:** 12-18 ☐ 18-40 ☐

4. **Class:** JSS 1-3 ☐ SS 1-3 ☐

5. **Department:** Art ☐ Science ☐ Commercial ☐

6. **Name of the**

   School:……………………………………………………………..

PART II

NOTE: In answering the following questions, please put a tick (√) how often teacher uses the ICT equipment's in the classroom and school settings.

Degree of Frequency:

1= NEVER   2=RARELY   3=SOMETIMES   4=ALWAYS

S/N	STUDENTS PART	NEVER	RARELY	SOMETIMES	ALWAYS
01	Do your school uses **computers** either in offices or in classes?				
02	Are you allowed to bring your **smart/digital devices such as phones, laptop** and **i-pad** to the class.?				

03	Are you allowed to go to the **computer room/lab** for practical?				
04.	Do your teachers use **Photocopy machines, Scanner** and **Printers** in their offices?				
05.	Do your school uses **computer based test (CBT)** for exams				
06.	Do your teachers use **Smart/White Board** in your class?				
07.	Do your school uses an **Email or fax machine** to send and receive messages?				
08.	Do your school have **a free LAN internet** for students?				
09.	Do your school have a dedicated **web site** which can be access from anywhere?				
	TEACHERS PART	**NEVER**	**RARELY**	**SOMETIMES**	**ALWAYS**
10.	Are you aware of any Government policy with respect to the use of ICT in secondary schools in your school?				
11.	Do your school have any intervention from either Government or				

	NGO in terms of ICT?				
12.	Do you use **projector** in every lesson?				
13.	Do you use **digital video/audio recorder** while teaching?				
14.	Do you use **computer systems** for research **or** teaching in the classrooms?				
15.	Do you use **power point** as a teaching tool in all your classes?				
16.	Do you use **tape recorders** in order to improve students listening skills?				
17.	Do you use **smart phones, emails or fax** to exchange information with parents/students while at home?				
18.	Do you use **computerized database** in exams and records department?				
19.	**Do you think ICT** can develops student's **inquiry skills**?				
20.	**Do you think ICT can** develops student' higher order **thinking skills?**				

21.	**Do you think ICT** can motivate students to work **collectively** in class?				
22.	**Do you think ICT** will encourages students in **"learning by doing"?**				
23.	**Do you think ICT** can encourages students to **explore** different channels **worldwide** in order to search for information?				

PART III

Please comment briefly on the following issues:

1. Who provide your school with the internet connation? Is it Government, School authority or Non-Governmental Organization? Please explain……………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…

2. How do your School acquire the ICT fertilities (Laptops, Printers, and Projectors etc.)? From parents, Government or donation from individual?..
....
....
....
....

3. Have you ever been sponsored either by government or the school to take part in any ICT related course?..

....
....
....
....

4. According to your point of view, do you think the use of ICT tools in teaching and learning will contribute (add) to your Academic Performance?

…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………

5. Do you think in public Secondary Schools in Northern Nigeria have enough ICT amenities in order to get benefit out of it? Give reasons for your answer.

…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………..………………….…………………………
…………………………………………………………………………………

6. Further Comments:

…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………
…………………………………………………………………………………

Appendix D: Student`s Part Questionnaire reliability SPSS output

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Uses of computers either in offices or classes	15.1167	6.776	0.332	0.620
Bringing personal smart/digital devices such as phones, laptop and i-pad to the class?	15.6500	7.103	0.139	0.671
Being allowed to the computer room/lab for practical	14.9583	6.528	0.387	0.606
Photocopy machines scanner and printers in teachers offices	14.8167	6.386	0.372	0.610
Computer Based Test (CBT) for exams	15.7250	6.436	0.412	0.600
Do your teachers use smart/white board in your class?	16.2333	6.584	0.412	0.602
Do your school uses e-mail or fax machine to send or receive messages?	15.8500	6.011	0.408	0.600
Free LAN internet for students in school	16.5667	7.626	0.256	0.639
Do your school have a dedicated web site which can be access from anywhere?	16.5500	7.308	0.279	0.632

Appendix E: Teacher`s Part Questionnaire reliability SPSS output

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Are you aware of any Government policy with respect to the use of ICT in your school?	30.5278	9.628	0.395	0.620
Do your school have any intervention either from Government or any NGO in terms of ICT facilities?	30.5833	10.307	0.254	0.644
Do you use digital video/audio recorder in your teaching?	31.2222	9.263	0.426	0.613
Do you use computer systems for research or teaching in the classrooms?	29.9444	10.625	0.132	0.667
Do you use power point as a teaching tool in your class?	31.3333	9.943	0.240	0.651
Do you use tape of recorders to improve students listening skills?	31.3611	10.637	0.173	0.657
Do you use computerized database in exams and records department?	30.5000	9.857	0.272	0.644
Do you think ICT can develops student inquiry skills?	29.3333	10.171	0.412	0.624
Do you think ICT can develops student' higher order thinking skills?	29.3611	9.952	0.412	0.621
Do you think ICT can motivate student to work collectively in class?	29.3889	9.902	0.421	0.619
Do you think ICT will encourage student in learning by doing?	29.4444	9.968	0.345	0.630
Do you think the use of ICT tools in teaching and learning will add to academic performance?	31.9167	11.393	0.098	0.660

Do you think in Public Secondary Schools in Northern Nigeria have enough ICT amenities in order to get benefit out of it?	31.0833	11.164	0.221	0.651

Appendix F: Sample Interview Questions

Q1. The federal government of Nigeria in 1998 enacted a policy "National Policy on Computer Education" which aims at introducing the use of Computer in Education. Again in 2004, the federal Government also introduced a "National Policy on Education" which integrates ICT in education in Nigerian schools. Sir, how can you rate the extent of implementation of these policies in the public schools in your state?

Q2. Again in 2006, the federal ministry of education lunched an ICT driven project kwon as SchoolNet (www.snng.org) which was intended to equip all Nigerian schools with computers and communication technologies. Sir, do the public schools in your states benefited from this project? If not sir, what is the source of your ICT facilities?

Q3. The major telecom operators in Nigeria (MTN) also have a project called "MTN schoolConnet" which aims at addressing the severe digital infrastructure problems on schools in some selected states in Nigeria. Is your state part of the project?

Q4. Sir, all these polices so far were initiated by either the federal government or a Non-governmental organization, do your ministry at the state level have any policy or intervention of such type?

Q5. Federal Government has introduced the use of computers in the National examinations (i.e. Computer Based Test CBT) what is your opening with respect to that?

Q6. Do you have any department in your ministry that is committed to oversee the use of ICT in the public schools and to train the prospective teachers in the use of ICT in their teaching practice?

Q7. What is your hope with respect to the use ICT In teaching and learning in the state own public schools?