

Efficiency of Information and Communication Technology (ICT) Utilization in Teaching Senior Secondary School Students in Katsina State

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ABSTRACT

This study examines the efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students in Katsina State. The population of the study comprised six (6) Senior Secondary Schools in Katsina State. 723 respondents participated, 100 students were selected randomly from six senior secondary schools in the state for the study. A self-designed questionnaire titled as Questionnaire on students efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students (QEICTUTS) with $r=0.744$ Cronbach alpha was used to gather data on the study. Data collected were analyzed using chi-square, t-test and frequency count and percentage scores. The result indicated that students used of ICT facilities in the senior secondary schools in Katsina State. Furthermore, the results also indicated that some challenges were affecting ICT utilization in senior secondary schools. Based on these findings, recommendations and suggestions were made proper and for effective utilization ICT facilities and training for Senior Secondary School Students in Katsina State.

Keywords: Efficiency, ICT, Utilization, Teaching and Students

INTRODUCTION

Efficiency of ICT utilization in teaching secondary school education programme is gaining momentum and interest throughout the world. Teaching process has been dramatically altered by the convergence of a variety of technological, instructional and pedagogical developments in recent times. In the 21st century, the term “technology” is an important issue in many fields including education. This is because technology has become the knowledge transfer highway in most countries of the world such as Nigeria. Efficiency of ICT utilization nowadays has gone through innovations and it has transformed the societies that have totally changed the way students’ thinks, work and live (Grabe, 2007). As part of this, schools and other educational institutions which are supposed to prepare students to live in “a knowledge society” need to consider ICT as instructional material integration in their curriculum (Ghavifekr, Afshari and Amla Salleh, 2012). Efficiency of Information and Communication Technology (ICT) utilization as an instructional material in teaching in Senior Secondary Schools education which Katsina State refers to the use of computer- based communication that incorporates into daily classroom instructional process. In conjunction with preparing students for the current digital era, teachers are seen as the key players in using ICT in their daily classrooms. This is due to the capability of ICT in providing dynamic and proactive teaching environment (Arnseth and Hatlevik, 2012). While, the aim of ICT utilization in teaching is to improve and increase the quality, accessibility and cost-efficiency of the delivery of instruction to students, it also refers to benefits from networking for the learning communities to face the challenges of current globalization (Albirini, 2006).

Process of adoption of ICT utilization is not a single step, but it is ongoing and continuous steps that fully

support teaching and information resources (Young, 2003). The efficiency of ICT in education generally means technology-based teaching process that closely relates to the utilization of learning technologies in schools. Due to the fact that students are familiar with technology and can learn better within technology-based environment, the issue of ICT integration in schools, specifically in the classroom is vital. This is because; the utilization of ICT as a technology in Senior Secondary Schools, Katsina State contributes a lot in the pedagogical aspects in which the application of ICT leads to effective learning with the help and supports from ICT elements and components (Jamieson-Procter, 2013). It is right to say that almost of subjects. In areas such as mathematics, science, languages, arts and humanities and can be learned more effectively through technology-based tools and equipment. In addition, ICT provides the help and complementary supports for both teachers and students where it involves effective learning with the help of the computers to serve the purpose of learning aids (Jorge, 2003). The efficiency of Information and Communication Technology (ICT) utilization in teaching is very important for it provides opportunities for teachers and students to operate, store, manipulate and retrieve information, encourage independent and active learning and self-responsibility for learning such as distance learning, motivate teachers and students in achieving education objectives. The teaching and learning material (TLM) are any collection of materials including animate and inanimate objects, human and non-human resources that a teacher may use in teaching and learning situations to help achieve desired learning objectives. ICT tends to expand access to education. Through efficient (ICT) utilization, learning can occur anytime and anywhere. Online course materials, for example, can be accessible 24 hours a day, seven days a week. Teleconferencing classrooms allow both learner and teacher to interact simultaneously with ease and convenience.

Based on efficient (ICT) utilization, senior secondary school students in Katsina State, teaching no longer depend exclusively on printed materials. This is because multiple resources are abundant on the Internet, and knowledge can be acquired through video clips, audio sounds, and visual presentation and so on. Current research has indicated that efficient (ICT) utilization assists in transforming a teaching environment into a learner-centered one ((Grabe, 2007). Information and Communication Technology utilization is an umbrella term that includes any communication device or applications device or application, encompassing: radio, television, cellular phones, Satellite systems, etc, as well as the various services and applications associated with them such as video conferencing and distance learning. Blurton (2004) defines it as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store and manage information. The Milken Exchange on Education Technology (2000) saw ICT as computer based tools used by students to work with the information and communication processing needs of an academic achievement. It encompasses the computer hardware and software, the network and several other devices (video, audio, photography camera, etc.) that convert information (text), images, sound, and motion and so on into common digital form. To Yusuf (2000), it is an eclectic application of computing, communication, telecommunication and satellite technology. Efficiency of (ICT) utilization in teaching senior secondary students has become a very important part of the educational system not only as a subject but also as an integral part of instructional delivery in institutions of learning. Instructional delivery is the actual teaching or execution of instruction in the classroom. The way and manner the teacher delivers his/her lesson goes a long way toward facilitating and sustaining pupil's interest in the lesson. The methods and materials he/she employs in his/her lesson delivery increases the productivity and retention rates of the learners. With efficiency of (ICT) tools, the teacher appeals to the multi-sensory organs of the learners. The teacher brings to life his/her lesson by creating a learning environment where students not only see, hear but also participate in the lesson. When the secondary school teacher employs this avenue, he is increasing the productivity and retention of pupils. This is due to the fact that children remember twenty percent of what they see, forty percent of what they see and hear but about seventy five percent of what they see and hear and do simultaneously.

According to Fisher (2005), Efficiency of (ICT) utilization as a tool has the potential to transform the way that education is delivered. It can facilitate differentiation and individualization in education. It makes it

possible to tailor both the content and the presentation of the subject matter to the individual background, experience and needs of students (Fisher, 2005). Contributing to this, Schiller and Tillett (2004) asserted that efficient (ICT) utilization enhances what is possible by amplifying what teachers are able to do, by providing an entry point to content and enquiries that were not possible without the use of ICT utilization, by extending what students are able to produce as a result of their investigations, and finally by providing teachers with the opportunity to become learners again. Efficiency of (ICT) utilization tools in teaching delivery at the secondary school levels will help to produce better students who can confidently and comfortably compete with others both within and outside their immediate environment. ICT tools that the secondary school teachers and students utilize in his/their lessons include the desktop, laptop, notebook, handheld computers, digital cameras, local area networking, Bluetooth, the internet, cloud computing, the world wide web, streaming, DVS, television, video player, radio (tape recorder), multimedia projector, printer, scanner, satellite disc, interactive white boards, electronic notice board etc and applications such as word processors, spreadsheets, tutorials, simulations, email, digital libraries, computer mediated conferencing, video conferencing, virtual environment, simulator and emulator etc. The efficiency of Information communication technology (ICT) to teaching and learning process cannot be underestimated in the sense that the use of ICT in teaching and learning is a relevant and functional way of providing education to learners in order to assist them in imbibing the required capacity for the world of work (Kosoko-Oyedeko and Adedaja, 2012). Ajayi (2008) posits that with the aid of ICT, teachers can take students beyond traditional limits, ensure their adequate participation in teaching and learning process and create vital environments to experiment and explore. Rosen and Michelle cited in Aduwa-Ogiegbaen and Iyamu (2005) affirm that the role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education policy.

The Federal Government of Nigeria (2001) has put in place a policy document entitled the “National Policy for Information Technology”. The policy clearly spelt out the ICT utilization vision, mission and policies for Nigeria education system. Also, FGN (2004) acknowledge the importance of using ICT in improving knowledge and thus states in the National Policy that government shall provide necessary infrastructure and training for the integration of ICT in advancing knowledge and skill in the modern world. (FRN, 2004) It is assumed that Federal Government Policy has been implemented. ICT has been recognized to be a very powerful tool in education reform in Katsina State in the sense that there has been a tremendous transformation in the education sector as a result of rapid advances in Information and Communication Technology (ICT) utilization. It has radically influenced the way knowledge and information are generated, developed and transmitted by senior secondary school students in Katsina State. ICT has also reduced the entire world into a global village and replaced the use of physical strength in performing task with automation. Teachers, teacher trainer and educationists who are not familiar with efficiency of ICT utilization find themselves threatened by professional obsolescence (Adewoyin, 2009). Since education is perceived generally as an instrument par excellence for effecting social changes. It is against this background that the researchers intend to examine the efficiency of Information and Communication Technology (ICT) utilization in teaching in Senior Secondary Schools, Katsina State. Therefore, the researchers intend to find out whether (ICT) utilization enhances students’ academic performance and educational development or not.

Problem Statement/Justification

It is unfortunate that most teachers today do not have technological training to guide themselves and their students in the use of computers to enhance learning achievement, in spite of the importance of ICT for teachers in improving knowledge. With this regard, ignorance of teachers’ ICT skills needed for effective instructional delivery could be caused by the dearth of ICT facilities in most secondary schools for the training of students; the high cost of computer and teaching aids ownership is a major constraint to acquisition of the items; access to affordable and reliable internet connectivity is only available in a few

secondary schools. There is also lack of facilities and offices in the schools. Power fluctuations have also considerably reduced the reliability of the access and inadequate bandwidth also makes access difficult (Aimola, 2010). Advancement in technology in this era reshaped all students' activities including academic performance. The world has become a global village as postulated by experts where the use Information and Communication Technology (ICT) utilization is indispensable. The efficiency of information and communication technology utilization in Senior Secondary Schools, Katsina State is essential tools in teaching every subject in the school curriculum. In Katsina State, there are still many assumptions from parents that the ICT has negative effects on students' activities and academic performance. On the other hand, there are parents who allow their children to be exposed to ICT because they believe it help their children to be more alerts and informed in school. Today, schools are experiencing technological advancement and changes in improving their teaching and learning methods due to modern technology so as to meet the growing demands of their students. The main purpose of this study is to analysis the efficiency of ICT facilities in teaching process. Specifically, this study aims to identify; (i) the efficiency of ICT teachers' capacity in teaching perspectives and (ii) the benefits of ICT in teaching Secondary School students Katsina State. Teachers' belief on technology-based teaching with the development of learning technologies in the late 20th century, education system has changed rapidly. This is due to the capability of technology to provide a proactive, easy access and comprehensive teaching environment. Nowadays, Ministry of Education in all over Katsina State has provide a lot of facilities and training in order to enhance the use of advanced technologies in the States' teaching and learning process. The teacher-centered methods of delivery do not capture students' interest in the subject but allows them to dislike some subject and see the subject as difficult and not relevant to their life. The research is design to assess treatment and evaluate the efficiency of ICT utilization in teaching Senior Secondary School students in Katsina State.

Objective(s) of the Study

The general objectives of the research are to find the efficiency of Information and Communication Technology (ICT) utilization in teaching Senior Secondary Schools, Katsina State and its educational development. Thus, specific objectives formulated to help in achieving the general objectives are:

1. To find out the significant effect of ICT utilization in teaching Senior Secondary School Students in Katsina State.
2. To determine the significant impact of ICT utilization in teaching Senior Secondary School Students in Katsina State.
3. To detect the significant difference of ICT utilization in teaching Senior Secondary School Students in Katsina State.

Research Questions

The research questions were formulated to guide the study are:

1. What are the significant effects of ICT utilization in teaching Senior Secondary School Students in Katsina State?
2. Which significant impact of ICT utilization has in teaching Senior Secondary School Students in Katsina State?
3. What are significant differences of ICT utilization in teaching Senior Secondary School Students in Katsina State?

Research Hypotheses

1. There is no significant effect of ICT utilization in teaching Senior Secondary School Students, Katsina State.

2. There is no significant impact of ICT utilization in teaching Senior Secondary School Students, Katsina State.
3. There is no significant difference of ICT utilization in teaching Senior Secondary School Students, Katsina State.

LITERATURE REVIEW

Information and Communication Technology utilization can improve the nature of instruction in a few different ways, by expanding student inspiration and commitment, by encouraging the obtaining of essential aptitudes, and by upgrading educator preparing. ICTs are likewise groundbreaking instruments which, when utilized suitably, can elevate the move to a student focused condition. ICTs, particularly PCs and Internet advancements, empower better approaches for instructing and adapting instead of basically permit instructors and other studies to do what they have done before in a superior manner. The utilization of ICT has an effect on what other studies ought to realize, however it likewise assumes a significant job on how the understudies ought to learn. Alongside a move of educational programness from “content-focused” to “skill based”, the method of educational plans conveyance has now moved from “educator focused” types of conveyance to “understudy focused” types of conveyance. ICT gives motivation to learners for example, recordings, TV and interactive media PC programming that consolidate text, sound, and bright moving pictures can be utilized to give testing and bona fide content that will connect with the understudy in the learning procedure. Intelligent radio moreover utilizes audio effects, melodies, sensations, comic plays, and other execution shows to urge the understudies to tune in and turn out to be more associated with the exercises being conveyed.

A portion of the guardians of the respondents opined that their kids were feeling more inspired than before in such sort of educating in the homeroom as opposed to the generalization 45 minutes address. They were of the view that this sort of learning process is significantly more viable than the dull monolog study hall circumstance where the instructor just talks from a raised stage and the understudies simply tune in to the educator. ICT utilization changes the attributes of teaching and learning assignments, and thus plays a significant impact as arbiter of psychological turn of events, upgrading the obtaining of conventional intellectual capabilities as fundamental for life in our insight society. Uses and gratification theory also called functional theory therefore is concerned with the social and psychological origin of needs, which generate expectation and other consequences, mostly unintended ones (Katz, 2002). It is purely audience centered and addresses needs like surveillance, excitement, guidance, relaxation, tension release, socialization, escape and integration. These uses (exposure to the media) and gratification (benefits) are determined by the needs of members of the audience. Such needs may include information, entertainment, self-esteem and prestige. Through the uses and gratifications research, communication scholars have shown that everywhere, students selectively expose themselves to ICT content, choosing only those media messages that would serve the function of satisfying or gratifying their needs (Rosengren and Reimer, 2000). Therefore, uses and gratification approach emphasizes audience motive for making specific consumption choices and the consequences of that intentional media use. That is to say, they choose the content, make meaning of it and act on the meaning. It embraces the interactive nature of media and its audience. It is audience centered and addresses needs such as surveillance, identity, and socialization and information acquisition. Therefore, student’s needs are generated by their individual differences. It could be based on sex, ethnic group, and educational qualification because the needs are determined by whom or what they are, and student use the bearing of instructional materials in teaching and learning for the purpose of gratifying these needs (Okunna, 1999). The theories considered most appropriate for this research are Social Information Processing Theory and Media Equation Theory. Social Information Processing Theory explains online information. The theory was developed in 1992 by Joseph Walther cited in (Asemah, 2011).

The theory endorses online communication and proposes that despite the inherent lack of cues found in the

nonverbal communication of online interactions, there are many other ways for students to create and process personal, or individualized information. Walter believes relationship grow only to the extent that parties first gain information about each other and use the information to form interpersonal impressions of who they are. With these impressions in mind the interacting parties draw closer if the two parties both like other images being presented. Social Information Processing Theory is an interpersonal communication theory which suggests that online interpersonal relationship development might require more time to develop than face-to-face relationships, but when developed, it has the same influence as face-to-face communication. This means the more students use ICT, the more they influence their disposition to studies, given the fact that friends from online communication begin to exert influence on each other. Media Equation Theory, as noted by Griffin (2000), cited in Asemah and Edegoh (2012) is propounded by Bryon Reeves and Clifford Nass. This theory proposes that media are equal to real life and that electronic media in particular are being given human attributes. In most cases, people talk to computer as if they were talking to human beings.

More so, in most cases, you talk to your television as if you are discussing with human beings, hence you talk to television sets as if you are discussing with people. That is, people have personalized the media of mass communication to the extent that they now see them, just the way they see human beings. A range of ICT based learning activities are underpinned by Constructivist Learning Theory. Seymour Papert has argued that by learning computer programming, students learn how to think and learn for themselves. Papert created the computer programming language LOGO in which a small turtle is moved around the screen in response to programmed commands. Hypertext and the Internet have provided learners with vast quantities of information to explore and mine. The information learner's find on the Internet becomes knowledge when it is interpreted and processed by the human brain. This can be facilitated through a constructivist approach where the teacher provides scaffolding and guidance. Teachers need to know exactly how ICT utilization is used as a teaching tool, for their own purposes and to help students to use them. This research is about the efficiency of ICT as a tool in the classroom with the overall aim of increasing the effectiveness of teaching and improving students' learning. The research outlines a programme of objectives and related activities for an ICT enhanced learning environment in teaching secondary school students.

Rationales for the use of Technologies in Classrooms

Deals with student's place in society and hence policy makers want to be sure that learners are prepared to be unafraid of how technology works and to understand their role in society.

Vocational

Proposes that learning to operate technology is important because it enhances students' opportunities

Pedagogic

Calls for improved teaching and learning presuppose that technology can enhance traditional instruction methods.

Catalytic

These regard technologies as catalysts to enable desired change to take place in secondary schools. The rhetoric associated to ICT usually revolves around accounts and descriptions of how ICT use can revolutionize teaching and learning by enabling new ways of knowing, thinking, communicating and meaning making. During the past decades some researchers divided the ways of using ICT in the process of teaching and learning for example, divided technology use in teaching according to the degree of involvement into three levels: no use, familiarization and integration. Also, the following are five points

regarding the use of ICT in the process of teaching and learning secondary students:

1. Excitement and preparation for the future;
2. More interesting lessons for students;
3. Access to students with learning difficulties;
4. Attention problems, and;
5. Teachers enjoy using technology as they become more competent.

Effective use of ICT for teaching and learning in schools and universities is not widespread, even though the technology is now almost ubiquitous. Some teachers and lecturers have been able to integrate ICT utilization into their teaching, and more importantly engage students in making use of ICT as part of the process of learning. However there are still many barriers and impediments in the way of ICT becoming an integral part of teaching and learning. Some of these impediments will be discuss, with a special focus on beginning teachers and ICT. Throughout this research, the term “beginning teachers” are taken to include teachers who have recently entered the teaching professions as well as teacher education students in universities and other teacher education institutions.

Significance of the Study

The efficiency of ICT is essential tools in teaching every subject in the school curriculum. Information and Communication Technology (ICT) utilization capacity building in terms of human resources application development are enablers to equitable access to information and knowledge. Knowledge is information that is interpreted and used by decision makers to meet their goals. They allow the students to interact with words, symbols and ideas in way that develop their abilities in reading, listening, solving, viewing, thinking, speaking, writing, using media and technology. In a State like Katsina, there are still assumptions by parents that ICT utilization has negative effect on students’ academic performance. Therefore, ICT utilization in teaching plays an indispensable role in the field of education by facilitating and supplementing teaching process for efficiency of skills and capabilities. The emergence of ICT utilization as a result of advancement in technology has raised many questions among academics on the efficiency in utilization in teaching senior secondary school students. Whether these opportunities promote studies is a question that needs to be answered The research is of great importance to the parents, teachers, students and policy makers by understanding the diversity of ICT utilization in teaching senior secondary school students in Katsina State. Thus, the problem this research investigates is the efficiency of ICT utilization in teaching senior secondary school students in Katsina State and teachers’ constraints.

Scope and Limitations of the Study

The research covered the Efficiency of Information and Communication Technology (ICT) utilization in Teaching Secondary School Students, Katsina State. The scope is limited to effect, impact and difference of ICT utilization in teaching senior secondary school students. This cannot be effectively discussed without considering the demographic factors of the educational zones in Katsina State. The study is limited to Government Senior School Students within the three (3) Senatorial Zones in Katsina State.

METHODOLOGY/ STUDY AREA/SITE/DATA COLLECTION/DATA ANALYSIS:

Description of Methodology

The researchers employed descriptive survey design as its research methodology. Best and Khan (2013) opine that, descriptive survey involves clearly defined problems and objectives of the study. The method is concerned with the collection and analysis of data for the purpose of describing, evaluating or comparing current prevailing circumstances, events or occurrences. This assisted the researchers to record, analyze and

interpret the existing conditions of the efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students in Katsina State.

Study Area/Site

The researchers examine the efficiency of Information and Communication Technology utilization in teaching Senior Secondary School students, Katsina State. Two schools were randomly selected from the three (3) Senatorial Zones in Katsina State. The schools are: Government College, Katsina with (128) students, Government Day Secondary School, Dutsinma with (102) students, Federal Government College, Daura with (150) students, Government Day Secondary School, Mani with (98) students, Government Day Secondary School, Funtua with (130) students and Government Day Secondary School, Malumfashi with (115) students. A total of six (6) schools in the State and in each school, students were selected through simple random technique that includes boys and girls respectively. The total population of students stand at (723) with a sample size of (100) students used for the research as indicated in the table below. From the population describes above, the sample size and sample respondents of schools and students are selected using appropriate sampling techniques. The population is homogeneous as they almost belong to the sample age group, culture, religion and tribe. Although, the population involves male and female, the average age group of students are fifteen (15) years and above.

Table: Distribution of Government Secondary Schools in the three (3) Senatorial Zones and Selected Students with their Population and Sample Size in Katsina State

ZONE A	Pop. of Students selected	Male	Female	Total	Sample Size
Govt. College Katsina (GCK)	128	70	58	128	17.7
Govt. Day Secondary School, Dutsinma	102	60	42	102	14.1
ZONE B.					
Federal Govt. College Daura	150	80	70	150	20.6
Govt. Day Secondary School, Mani	98	48	50	98	13.5
ZONE C.					
Govt. Day Secondary School, Funtua	130	90	40	130	17.9
Govt. Day Secondary School, Malumfashi	115	50	65	115	15.9
Total No. of Schools = 6	723	398	325	723	99.7≈100

The Research Advisors (2006)

Total Summary:

No. of LGAs = 6

No. of Senatorial Zones = 3

No of Schools Selected	=	6
No. of Students selected	=	723
Sample Size	=	100

The efficiency of ICT utilization in teaching in the senatorial educational zones of Katsina State was evaluated using simple random and purposive sampling technique of thirty (30) respondents to which structured questionnaires was administered. Major constraints limiting the use of ICTs in the study zones includes power supply and inadequate number of computers and accessories, which even where present were not functioning well. To address the problems, the State government should work with the private sector and civil society to ensure affordable and sustainable efficiency of ICT infrastructure. ICT Education should be included in the secondary school curriculum while provision is made for necessary infrastructural support and massive training and development of skilled manpower.

Research Instruments

The instruments used for data collection in this research include the following:

Questionnaire on Efficiency of ICT utilization in Teaching Senior Secondary School Students (QEICTUTS)

The self-designed questionnaire on “Questionnaire on Efficiency of ICT utilization in Teaching Senior Secondary School Students” was developed after an intensive review on the concept. The inventory forms the foundation base for generating items used in the instrument for the research. The initial draft of the instrument had responses as Yes or No. After the trial test, the responses were changed to the present modified Likert attitudinal scales. The questionnaires for the students comprise two sections. Section A elicit demographic information of the students while section B contains fifteen (15) questions to elicit information on the students’ ICT utilization in teaching secondary school in Katsina State. The questionnaire was distributed to the respondents with the help of research assistants to ensure coverage in distribution and collection. The test instrument was scored with Likert scale of four responses on the bases of Strongly Agree (SD-4), Agree (A-3), Disagree (D-2) and Strongly Disagree (SD-1). It is a four point modified Likert attitudinal scales format ranging from 1-4 point.

Validity of the Instrument

The questionnaire was given to professionals, test constructors, some lecturers in Federal College of Education, Katsina and Umaru Musa Yardua, Katsina State for thorough scrutiny, clarity, precision, observation and corrections in order to minimize errors in interpretation. After making series of corrections, the content of the instrument was ascertained valid and found to be capable for measuring efficiency of ICT utilization in teaching senior secondary school students, Katsina State.

Reliability of the Instrument

The researchers pre-tested fifteen (15) questionnaires at an interval of two (2) weeks at some selected secondary schools in Jibia Local Government Area and Bakori Local Government Area in Katsina State which are different from the schools used for the research. A test re-tests method for determining test reliability was employed to compare and determine consistency and it yields a high reliability index, which was considered appropriate in this research.

Method of Data Collection

The researchers travelled to the three (3) Senatorial Zones that comprise: Government College Katsina, Government Day Secondary School Dustinma, Federal Government College, Daura, Government Day Secondary School, Mani, Government Day Secondary School Funtua and Government Day Secondary School Malumfashi in the State to administer the instrument to the respondents by direct delivery. In the process of data collection, the researchers employed the services of research assistant from the schools to help in the process of administering the instruments. Each respondent was given a copy of the questionnaire for completion under the guidance of the researchers and his assistant who helped the respondents to fill them and return back immediately.

Method of Data Analysis

The data collected from the responses were coded and analyzed to answer the questions using the inferential statistics of chi-square for efficiency, t-test for differences while frequency and percentage were used as the descriptive statistics to uphold or reject the hypothesis advanced for the research of an alpha of 0.05% level of significance. The analysis of the data generated from the respondents through questionnaire and testing of the hypotheses was done using Statistical Package for Social Science (SPSS).

Data Analysis

In this section, data collection and analysis are discussed. The responses to a 100-questions questionnaire were evaluated to answer the research objectives and hypotheses created in order to determine the efficiency of Information and Communication Technology (ICT) utilization in teaching Senior Secondary Schools, Katsina State and its educational development.

Identification and Socio-demographic Information of the Respondents

This aspect deals with the descriptive part of the analysis in relation to the socio-demographic characteristics of the respondents.

Table 1: Distribution of Socio-Demographic Characteristics

Variables	Levels	Frequency	Percentage (%)	Mean ± SD
Age	14 yr	2	2	16 ± 0.903
	15 yr	30	30	
	16 yr	31	31	
	17 yr	35	35	
	18 yr	2	2	
Sex	Male	48	48	
	Female	52	52	
Total		100	100	

Table 1 showed that the highest percentage of the respondents are of age 17 years with 35%, followed by 16 years with 31%, followed by 15 years with 30% while the least percentage of them fall on 14years and 18years with 2% and 2% respectively. Out of 100 that participated in the research, 48% were males and 52% were females with the age mean of 16 and standard deviation of 0.9. It implies that females were predominant in the study area while the highest proportions of them were of 17 years.

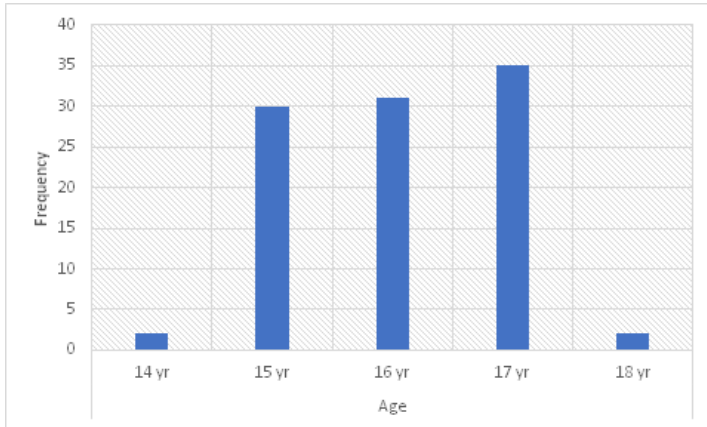


Figure 1: Age Distribution of the Respondents

Figure 1 indicated the aged 17 years as the highest while the least were the age 14 years and 18 years.

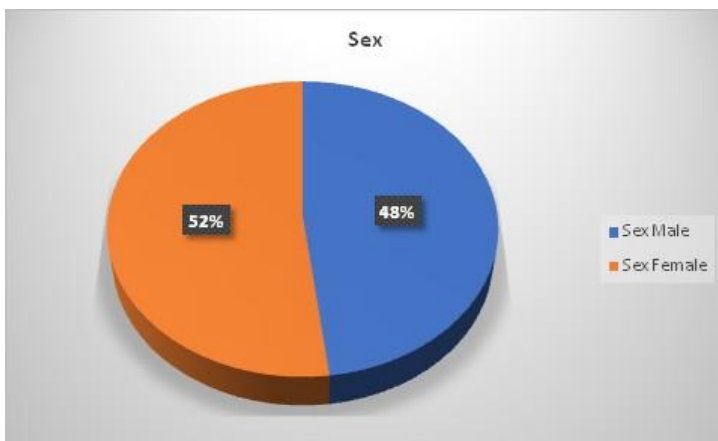


Figure 2: Sex Distribution of the Respondents

Figure 2 affirmed that females predominate in the research area, with the majority of them being the age of 17.

Testing of the Research Objectives Students’ Access to ICT Utilization Facilities

Here, the access of senior secondary schools’ students to information communication technology (ICT) utilization facilities was discussed

Table 2: Distribution of Students’ Access to ICT Utilization Facilities

Variables	Yes (%)	No (%)
Internet facilities	25 (25)	75 (75)
E- Educational sites	39 (39)	61 (61)
E- Library	35 (35)	65 (65)
Computer centre	83 (83)	17 (17)
Laptops	20 (20)	80 (80)
Generator set or Solar Power Energy	18 (18)	82 (82)

It can be depicted from the Table 2 that 25% of the respondents claimed to have access to internal facilities

while 75% did not. For E- Educational sites, 39% of the respondents claimed ‘Yes’ while 61% claimed ‘No’. 35% of them agree with the access to E-library while 65% disagree. For the access to computer science, majority of the respondents claimed ‘Yes’ with 83% while minority claimed ‘No’ with 17%. 20% of the respondents claimed access to laptops while 80% claimed ‘No’. 18% of the respondents said they had access to generator set or solar power energy, but 82% of them said they did not.

Efficiency of ICT Utilization and Educational Development

This section is to determine the efficiency of ICT utilization and educational development among senior secondary schools’ students.

Table 3: Distribution of Students’ Efficiency of ICT and Educational Development

Items	SA (%)	A (%)	D (%)	SD (%)
ICT utilization helps me to make friend.	56	33	6	5
The ICT utilization teach more violence which are against the social values.	41	6	52	1
ICT utilization transmits social vices faster than other moral values in the society.	50	33	13	4
I use ICT facilities in the school and this has helped me to learn and perform better.	3	26	68	3
Students exposed to social networks perform better than those not exposed to them.	46	7	44	3
The school ICT facilities enhance my learning.	40	35	15	10
Availability and usage of ICT has helped me to improve my academic performance	47	46	5	2
Websites I visited on ICT make learning more meaningful compared to learning at school.	61	14	20	5
I read only my books for my academic studies instead of using ICT facilities.	67	3	24	6
ICT utilization has helped me to improve my academic performance.	53	7	34	6
ICT I visited make learning more meaningful compared to learning at school.	50	6	38	6
The urban schools have more access to ICT facilities than rural schools.	56	30	9	5
ICT is used to make more social connections in the urban schools than rural schools.	56	27	12	5
Male students are more exposed to ICT facilities than female students.	65	20	11	4
Female students chat more on ICT utilization than male students do.	70	17	7	6

Keys: Strongly Agree (SA), Agree (A), Disagree (D), Strongly Disagree (SD)

Table 3 suggests that majority of the respondents strongly agree that ICT utilization helps them to make friends with 56%, 33% of them agree, and 6% of them disagree and 5% of them strongly disagree. 41% of the respondents strongly agree that the ICT utilization teaches more violence which is against the social values, 6% agree, 52% disagree and only 1% strongly disagree. Half (50%) of the respondents strongly agree that ICT utilization transmits social vices faster than other moral values in the society, 33% agreed,

13% disagree and 4% strongly disagree. Just 3% strongly agreed of using ICT facilities in the school and which has helped them to learn and perform better, 26% agree, 68% disagree and 3% strongly disagree. 46% claimed that students who exposed to social networks perform better than those who do not exposed to it with strong agreement, 7% agree, 44% disagree and just 3% strongly disagree. For the school ICT facilities in learning enhancement, 40% strongly agree, 35% agree, 15% disagree and 10% strongly disagree. 47% strongly agree that availability and usage of ICT has helped them to improve their academic performance while 46% agreed, 5% disagreed and 2% strongly disagreed. 61% of the respondents claimed that visiting websites via ICT make learning more meaningful compared to learning at school with strong agreement, 14% with agreement, 20% with disagreement and 5% with strong disagreement. 67% of the respondents strongly agree claimed that reading books only for academic studies is better than using ICT facilities, 3% agreed, 24% disagree and 6% strongly disagree. 53% strongly agree that ICT utilization has helped them to improve their academic performance, 7% agreed, 34% disagree and 6% strongly disagree. Half (50%) of the respondents strongly agree that visiting ICT make learning more meaningful compared to learning at school, 6% agree, 38% disagree and 6% strongly disagree. 56% strongly agree that the urban schools have more access to ICT facilities than rural schools, 30% agree, 9% disagree and 5% strongly disagree. 56% strongly agree that ICT is used to make more social connections in the urban schools than rural schools, 27% agreed, 12% disagreed and 5% strongly disagreed. For the agreement of how male students are more exposed to ICT facilities than female students, 65% strongly agreed, 20% agree, 11% disagree and 4% strongly disagree. For the agreement of how female students chat more on ICT utilization than male students do, 70% strongly agree, 17% agree, 7% disagree and 6% strongly disagree.

Testing of the Hypotheses

First Hypothesis Testing and Interpretation

H_0 1: There is no significant effect of ICT utilization in teaching Senior Secondary School Students in Katsina State.

H_1 1: There is significant effect of ICT utilization in teaching Senior Secondary School Students in Katsina State.

Table 4: Analysis of ICT Utilization and Educational Development

Variables	N	χ^2 - Value	df	P-value	Remark
ICT Utilization and Educational Development	100	174.72	6	0.000	Sig. (Reject H_0)

It is shown from the table above that the p-value is lesser than the level of significance (?) i.e. $0.000 < 0.05$ which shows the significance of the first hypothesis set above. Therefore, the null hypothesis is said to be rejected by concluding that there is significant effect of ICT utilization in teaching Senior Secondary School Students in Katsina State. Hence, the test is significant. The result shows that ICT utilization influences the educational development among senior secondary school students in Katsina State at 5% level of significance.

Second Hypothesis Testing and Interpretation

H_0 2: There is no significant impact of ICT utilization in teaching Senior Secondary School Students in Katsina State.

H₁2: There is significant impact of ICT utilization in teaching Senior Secondary School Students in Katsina State.

Table 5: Analysis of ICT Utilization’s Impact in Teaching

Variables	N	χ^2 – Value	Df	P-value	Remark
Effect of ICT utilization in teaching	100	82.681	4	0.003	Sig. (Reject H ₀)

It is established from the above table that the p-value is lesser than the level of significance (?) i.e. $0.003 < 0.05$ which shows the significance of the second hypothesis set above. Therefore, there is sufficient evidence to reject the null hypothesis leading to the conclusion of significant impact of ICT utilization in teaching Senior Secondary School Students, Katsina State. The result implies that ICT utilization has impact on teaching Senior Secondary School Students, Katsina State via educational at 5% level of significance.

Third Hypothesis Testing and Interpretation

H₀3: There is no significant difference of ICT utilization in teaching Senior Secondary School Students in Katsina State.

H₁3: There is significant difference of ICT utilization in teaching Senior Secondary School Students in Katsina State.

Table 6: Analysis of Significant Difference of ICT Utilization in Teaching

Variables	N	t – Value	Df	P-value	Remark
Significant Difference of ICT Utilization in Teaching	100	-3	12	0.423	Not Sig. (Do not Reject H ₀)

It is indicated from the above table that the p-value is greater than the level of significance (?) i.e. $0.423 > 0.05$ which shows the insignificance of the third hypothesis set above. Therefore, there is no sufficient evidence to reject the null hypothesis leading to the conclusion of no significant difference of ICT utilization in teaching Senior Secondary School Students, Katsina State. The result affirms that with ICT utilization and books’ reading, no significant difference in relation educational development among senior secondary school students, Katsina State at 5% level of significance.

DISCUSSION OF FINDINGS

Based on the hypotheses tested and analysed, the study discussed the result of the findings as follows: First Hypothesis which states that there was no significant effect of ICT utilization in teaching Senior Secondary School Students, Katsina State, the hypothesis was rejected, this is because it was found that teachings and ICT utilization are related. The study supported the findings of (Grabe, 2007) in his conducted research which states that “the effectiveness of ICT use today has evolved via innovations and reshaped our societies, completely altering how students think, work, and live”. Similarly, the work of (Ghavifekr, Afshari and Amla Salleh, 2012) schools and other educational institutions that want to prepare students for “a knowledge society” must take into account integrating ICT into their curricula. In the second hypothesis, the study found significant impact of ICT utilization in teaching Senior Secondary School Students, Katsina

State, this is because 61% of the students strongly agreed that visiting websites via ICT make learning more meaningful compared to learning at school. This is in consonance with the findings made by (Arnseth and Hatlevik, 2012) who reported that ICT's capacity to create active, dynamic learning environments. It is as well supported by (Albirini, 2006) that "the goal of utilizing ICT in teaching is to raise the standard, make it more accessible, and reduce the cost of providing education to students. It also refers to the advantages of networking learning communities to meet the problems of present globalization". The third hypothesis revealed that there was no significant difference of ICT utilization in teaching Senior Secondary School Students in Katsina State. This means that there is no discernible difference between senior secondary school pupils' educational growth when using ICT and when reading books. This was in line with the conclusions reached by (Kosoko-Oyedeko and Tella, 2010) regarding the use of ICT tools those secondary school teachers and students could make use of in the delivery of his lessons. These tools include desktop, laptop, notebook, handheld computers, digital cameras, local area networking, and local area networks.

CONCLUSION

The analysis resulted in number of findings consistent with the objective of the study. It is shown that all the students who served as part of the respondents are adolescents i.e. all of them were not dependents population and that the effectiveness of ICT use today has evolved via innovations and reshaped our societies, completely altering how students thinks, works, and live. The result of the hypotheses tested shows that the senior secondary school students in Katsina State depend significantly on their efficiency of information and communication technology (ICT) utilization in teaching senior secondary school students in Katsina State. Also the senior secondary school students ICT utilization has effect on their academic performance. For the agreement of how male students are more exposed to ICT utilization facilities than female students, 65% strongly agree, 20% agree, 11% disagree and 4% strongly disagree. Therefore the null hypotheses is said to be rejected by concluding that there is significant of ICT utilization because the test is significant. These findings are rigid and reliable in correspondence to the findings of following researchers as stated before: Grabe(2007), Albirini(2006), and Oyedeko and Tella(2010) regarding the efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students in Katsina State.

RECOMMENDATIONS

Based on findings of this study and with the conclusion derived from statistical analysis of the efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students in Katsina State, the researchers are making the following recommendations:

1. ICT utilization should be expanded to enhance teaching academic activities in order to avoid setbacks in students' academic performance.
2. The students should try as much as possible to create a balanced distinction between chit-chatting, games and academic activities.
3. There should be a decrease in the number of time spent by students when surfing the internet and social media.
4. The ICT utilization by teachers and students should focus more on the positive side than on the negative side to achieve balance.

Suggestions for Further Studies

Further studies should be conducted to create more pages for research and academic activities to enable students improve in their academic performance so as to become the leaders of tomorrow, thereby avoiding distraction which leads to deviation from academic work. Also effective of ICT utilization in Teaching

Senior Secondary School Students in Katsina State should be made easy for students in urban and rural areas to help them meet up with the academic work.

1. Similar study should be conducted in primary schools usage of ICT facilities.
2. The study can be investigated in other states of the country.
3. Tertiary institutions could also be investigated on similar instrument.
4. ICT facilities should be provided at all level of educational institution.

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Yusuf, Habib Osuwa

Dr. Ahmed Tijjani Ibrahim

Dr. Mustapha Shariff Abdulkadir.

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Appendix A

Dear Respondent,

The questionnaire is on the “Efficiency of Information and Communication Technology (ICT) utilization in Teaching Senior Secondary School Students in Katsina State”. You are therefore requested to contribute to the success of this research by giving honest responses to the given statements. Please, you are to assist in responding to the items on this questionnaire as they apply to you by ticking (?) in the appropriate column to show the level of your agreement on each item. There is no right or wrong answer. Your responses will be treated with utmost confidentiality.

Yours faithfully,

Yusuf Habib Osuwa

Dr. Ahmad Tijjani Ibrahim

Dr. Mustapha Shariff Abdulkadir

Appendix B

Questionnaire on Efficiency of (ICT) utilization in Teaching Senior Secondary School Students (QEICTUTS)

Questionnaire for Students

Demographic Information

Name Optional _____

Age _____

Sex _____

Does your school have access to (ICT) utilization facilities such as?

S/No.	Items	Yes	No
1.	Internet facilities		
2.	E- Educational sites		
3.	E- Library		
4.	Computer centre		
6.	Laptops		
7.	Generator set or Solar Power Energy		

S/No.	Items	Strongly Agree (SD) 4	Agree (A) 3	Disagree(D) 2	Strongly Disagree(SD)1
1.	ICT utilization helps me to make friend.				
2.	The ICT utilization teach more violence which are against the social values.				
3.	ICT utilization transmits social vices faster than other moral values in the society.				
4.	I use ICT facilities in the school and this has helped me to learn and perform better.				
5.	Students exposed to social networks perform better than those not exposed to them.				
6.	The school ICT facilities enhance my learning.				

7.	Availability and usage of ICT has helped me to improve my academic performance				
8.	Websites I visited on ICT make learning more meaningful compared to learning at school.				
9.	I read only my books for my academic studies instead of using ICT facilities.				
10.	ICT utilization has helped me to improve my academic performance.				
11.	ICT I visited make learning more meaningful compared to learning at school.				
12.	The urban schools have more access to ICT facilities than rural schools.				
13.	ICT is use to make more social connections in the urban schools than rural schools.				
14.	Male students are more exposed to ICT facilities than female students.				
15.	Female students chat more on ICT utilization than male students do.				

Required Sample Size[†]

from: The Research Advisors

Population Size	Probability of Success	Confidence = 95.0%				Confidence = 99.0%			
		Degree of Accuracy/Margin of Error		Degree of Accuracy/Margin of Error		Degree of Accuracy/Margin of Error		Degree of Accuracy/Margin of Error	
		0.05	0.035	0.025	0.01	0.05	0.035	0.025	0.01
10		10	10	10	10	10	10	10	10
20		19	20	20	20	19	20	20	20
30		28	29	29	30	29	29	30	30
50		44	47	48	50	47	48	49	50
75		63	69	72	74	67	71	73	75
100		80	89	94	99	87	93	96	99
150		108	126	137	148	122	135	142	149
200		132	160	177	196	154	174	186	198
250		152	190	215	244	182	211	229	246
300		169	217	251	291	207	246	270	295
400		196	265	318	384	250	309	348	391
500		217	306	377	475	285	365	421	485

600		234	340	432	565		315	416	490	579
700		248	370	481	653		341	462	554	672
800		260	396	526	739		363	503	615	763
900		269	419	568	823		382	541	672	854
1,000		278	440	606	906		399	575	727	943
1,200		291	474	674	1067		427	636	827	1119
1,500		306	515	759	1297		460	712	959	1376
2,000		322	563	869	1655		498	808	1141	1785
2,500		333	597	952	1984		524	879	1288	2173
3,500		346	641	1068	2565		558	977	1510	2890
5,000		357	678	1176	3288		586	1066	1734	3842
7,500		365	710	1275	4211		610	1147	1960	5165
10,000		370	727	1332	4899		622	1193	2098	6239
25,000		378	760	1448	6939		646	1285	2399	9972
50,000		381	772	1491	8056		655	1318	2520	12455
75,000		382	776	1506	8514		658	1330	2563	13583
100,000		383	778	1513	8762		659	1336	2585	14227
250,000		384	782	1527	9248		662	1347	2626	15555
500,000		384	783	1532	9423		663	1350	2640	16055
1,000,000		384	783	1534	9512		663	1352	2647	16317
2,500,000		384	784	1536	9567		663	1353	2651	16478
10,000,000		384	784	1536	9594		663	1354	2653	16560
100,000,000		384	784	1537	9603		663	1354	2654	16584
264,000,000		384	784	1537	9603		663	1354	2654	16586
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