

**AVAILABILITY AND USAGE OF INFORMATION AND
COMMUNICATION TECHNOLOGY (ICT) RESOURCES FOR
TEACHING AND LEARNING IN SECONDARY SCHOOLS IN BWARI
AREA COUNCIL, ABUJA**

Prof. Reuben, Tunde Tolorunleke¹ & Dr. Olonikawu, Ade Samuel²

¹Faculty of Education

Prince Abubakar Audu University
Anyigba. Kogi State.

²Faculty of Education

Federal University Lokoja.
Kogi State. Nigeria

Corresponding Author: tolorunlekert@gmail.com,

Abstract

In this era of scientific and technological development, the standards of academic achievement in schools have been a matter of great concern to everybody. This is so because a lot of criticisms have been put forward on the performance of students in our public schools in Nigeria. The study was conducted to examine the availability and usage of Information and Communication Technology (ICT) resources for teaching and learning in secondary schools in Bwari Area Council FCT Abuja. The study adopted a survey research design. The population consist of 2015 students while 120 students randomly sampled for the study. Four research questions and three null hypotheses were raised and formulated respectively to guide the study. Data collected were analyzed using the mean and standard deviation for the research questions while t- test statistic was used for testing the null hypotheses. It was found that nine out of twenty ICT resources were available for teaching and learning in secondary schools, ICT resources were often utilized for teaching and learning, also ICT resources highly contributed to the teaching and learning in secondary schools. There was no significant difference in the mean ratings of teachers and students on the level of utilization of ICT resources, the contributions of ICT resources and the problem facing ICT resources in teaching and learning in secondary schools. It was recommended that relevant ICT resources for teaching and learning should be provided by government and

philanthropists in Bwari Area Council. Also, Workshop, seminars and short time training should be organized for teachers by school administrators and government in order to improve their skills in using all kinds of ICT resources for teaching and learning activities.

Keywords: Availability, Utilization, Information and Communication Technology

Introduction

Information and Communications Technology (ICT) is a technology trend that has brought the world into a global village. It is a buzzword in media and telecommunications which has revolutionized the economy, business, industry, politics and education. The ICT uses various information superhighways namely: the internet, intranet and extranet to function. The ICT is a science of information which uses the computer and multi-electronic resources to collect, process, store, retrieve and transmit or disseminate information to any part of the world. ICT has permeated virtually all aspects of human endeavor. It has crept into the educational system and has had obvious impact in the curriculum. ICT has been considered a priority in global education and Nigeria is not left out. The Federal government of Nigeria in the National Policy on Education (FRN, Revised 2014) recognizes ICT as a product of technological change and as an innovation in education.

Ibe-Bassey (2011) regards ICT as a critical tool for preparing and educating students with the required skills for the global work place. Information and Communication Technologies (ICTs) help to develop skills as it provides effective training programmes. It has capacity for stimulation, model-building and interactive adaptation and its usage applies not only to the sciences and language but also to various other professional courses (Osakwe, 2013).

Information and Communication Technologies (ICTs) help to build students skills and grant them exposure to experiences outside their environment. It also enlivens the teaching and learning environment by allowing the students to learn at their own pace while the teacher moderates the learning process. Eze and Aja (2014) stated that introduction of ICT in the school setting has a great impact in contributing to the achievement of the educational objectives, aims and goals as well as improving teaching and learning. If there is any technological development that has a very great potential for development in education and can improve educational quality, expand learning opportunities and make education accessible, it is the development of ICT.

Schools also are developing and implementing technology plans and investing in information and communication technology and other new technologies in particular, educators realize that information and communication technology resources offers flexible and powerful new ways to accomplish a range of goals in school. During the last two decades higher education institutions have invested

heavily on ICT. ICT has had a major impact in the university context, in organization and in teaching and learning methods. Therefore, education has to be continuously preoccupied to create information, handling skills and abilities among the students and teachers so that they have improved methods of teaching and learning through the provision of the necessary facilities. The use of Information and Communication Technology (ICT) in secondary schools have offered a sample opportunities and advantages to education more people rapidly to improve efficiency and to improve their academic performance.

According to Olonikawu(2009), availability means to be available, find or get in abundant. Necessary ICTs resources that are supposed to be available for teaching as well as keeping of school records, retrieving records, word-processing, analyzing students' performance, searching for knowledge include: electronic learning facilities (computer assisted learning, tutorial drills, database and excel, computer assisted design, spreadsheets, word processor, computer assisted testing), telephone, websites, fax/facsimile, electronic library, internet facilities, global system for mobile communication, white board, bulletin board, television lesson, radio broadcast, reprographic machine, storage devices, (compact disc), teleconferencing device, electronic-mail, interacting radio counseling, interactive voice system, audio-cassette, micrographic system, power-point device, photocopier, microfilm and computer to mention but a few. Information communication technology resources have become critical tools for professional training. The use of ICT in teaching and learning is becoming wider in scope today to our schools nationwide. ICT resources is not only restricted to its usage as instructional materials inform of teaching aid but has become a tool to reshape knowledge delivery and hence both teachers and students activities in the classroom (Olonikawu 2019).

According to Ghavifek, Kunjappan, Ramasamy and Anthony (2016), ICT resources in education mean teaching and learning using ICT tools. Educational ICT tools or resources are divided into three categories namely: input resources, output devices and others. Input sources include such things as personal computers (PCs), tablets, applications software, student response systems, visualizer or document camera. Output resources/devices refer to such devices as projector, interactive boards, monitors, display, and television. Others include digital camera, digital recorders, switchers and other technologies. The use of ICT tools can lead to improved student learning and better teaching methods with better resources. The resources include laboratories in schools, internet and limited computer facilities for teachers, no central databases are used and no learning management systems are available for purposes of electronic learning.

One can use tools like simulations and 3D virtual worlds in immersive learning environments, to construct scenarios that mimic realistic situations, and allow

individuals to train and practice their skills. Ofsted (2011) observes that learning analytics with the aim of improving student retention and providing high quality, personalized experience for learners can be achieved with the help of ICT resources. ICT resources for learning offer the possibility of acquiring knowledge, and understanding better procedures during the teaching and learning process. ICT resources offer various forms of work with content and activities work during the teaching and learning process. Eady and Lockyer (2010) argued that an integrated design of learning resources using ICT is an important part of the instructional process that helps achieve expected learning outcomes. To meet these challenges, learning institutions must embrace the new technologies and appropriate ICT tools for learning. The relationship between the use of ICT and student performance in higher education is not clear, and there are contradictory results in the literature.

The Government of Nigeria has been attaching a top priority and increasingly allocating huge resources for the expansion of equitable, relevant and quality education at all levels and quantitative progress has been made (MoE, 2008). However, the quality of education being offered is not been achieved at the desired level (MoE, 2008). This is so because a lot of criticisms have been put forward on the performance of students in our public schools in Nigeria.

Personal observation have shown that most parents in Nigeria do not have ICT support in their home and majority rarely apply ICT facilities in their daily activities while few others do have these facilities and also apply them in their daily activities. This is not too comfortable because skills demand profile globally has shown that ICT and internet network skills top the list of highly sought after skills followed by programming skill (Marilla, 2014). The fact that the future of our educational development depends on modern technology cannot be overemphasized. This technology stems from the availability and accessibility of ICT resources at home and parental knowledge on ICT resources usage. This triggered the researcher to examine the availability and use of information and communication technology (ICT) in teaching and learning in secondary schools in Bwari Area Councils FCT Abuja with the view to reveal a lot of facts that may be beneficial in the area of teaching and learning.

Research Question

In pursuance of the study the following research questions were raised:

1. What are the ICT resources available for teaching and learning in senior secondary schools Bwari Area Council FCT Abuja?
2. What is the level of .usage of the available ICT resources in the teaching and learning in secondary schools in Bwari Area council FCT Abuja?

Research Hypothesis

The following null-hypotheses were tested at 0.05 level of significance:

H0₁: There is no significant difference in the Mean ratings opinion of teachers and students on the ICT resources available for teaching and learning

H0₂: There is no significant difference in the Mean ratings of students and teachers on the contributions of ICT resources to the teaching and learning in secondary school in Bwari Area Council FCT.

Availability and Usage of ICT resources

Information and Communication Technology (ICT) resources are vital tools in education. This provides necessary information to the teachers as well the learners which aid teaching and learning. Umeh (2015) explained that resources involve all forms of information that use to promote, encourage and enhance learning activities. Similarly, ICT according to Umagha (2015) encompasses computers and telecommunication. As crucial as it is in the education arena, Udo (2010) cited by Onyeka et al (2012) observed that the application of ICT in teaching the school subject (inclusive) is to make learners better and teachers to teach well. He therefore conceived that the use of ICT resources is not a hindrance to students and teacher's relationship while Asyai (2015) opined that adequate supply of instructional resources helps to enhance teaching and learning process towards the achievement of set goals and objective. This was so pointed out because of the great need of the availability of teaching resources which Inyang-Abia (2004) pointed out to include computer, Audio-visual, textbooks as well as chalkboard.

In order to make teaching effective, the Federal Republic of Nigeria (2004) in recognition of the need of ICT in teaching states that it shall provide necessary infrastructure and learning for the integration of the role of ICT in advancing knowledge and skill in the modern world. Also Danjuma (2015), in his opinion maintains that "The quality of education that our children receives bear direct relevance on the availability or lack of it and the overall atmosphere in which teaching and learning take place". While Darhar and Faize (2011) contended that the availability of ICT resources and adequate application can better student level of achievement while Tousaf (2005) on similar study revealed that physical facilities such as chalkboard, textbook were favourable for student's successful transition to higher institution. In addition, he suggested that students could perform better in school when taught using computer than when being taught ordinarily in the classroom.

Onyegebu (2015) noted that new device such as CD-Rooms, video disc/tapes computers, interactive videos, internet etc. present in library makes the experience for students exciting and add new productive dimension. The writer is of the opinion that availability and effective use of ICT resources by the students at

secondary level of education can erase the unprecedented performance and promote scientific knowledge among students.

Finally, Jimoh (2010) pointed to a good relationship between effective teaching and use of ICT resources. He argued that “while some educators have been impressed by the potentials of ICT as the instructional materials to enhance teaching and learning of source subjects, ICT resources as the instructional medium are integral components of teaching learning situation. According to Jimoh (2010), it is not just supplementing learning but to complement it process. It is then shown that if there must be an effective teaching and learning activity then utilization of ICT instructional materials will be necessary.

Teachers Knowledge in the Use of ICT Resources.

The availability and use of ICT resources alone can no longer make a change in student’s academic level if there is no knowledgeable of teacher to make adequate use of the available materials. Emas and Ajayi (2015) opined that “without the teacher who is knowledgeable, the ICT resources cannot create change and progress” and the only time it begins to make impact is when the teacher begins to make use of it and allow it to take over its values. This portrays the professional attributes of the teacher and general knowledge or creativity to select, develop and use ICT resources effectively in the teaching and learning. According to Jimbo (2010) effective communication is usually the result of a careful selection of the appropriate medium or combination of media available by an effective teacher. This mean to ensure the transmission of message from one source to another by the use of former illustration that seems desirable and depict the real situation of the audience. He also added that teaching and learning material such as computers design and use facilitate the teaching and learning outcomes in. However, the success of using ICT resources to meet the teaching objectives demands effectives use communication skills of the teacher to satisfy instructional delivery.

Accessibility of ICT resources and academic performance

Accessibility to ICT facilities ensures accuracy, timeliness and effectiveness of managing the whole process of examination, that is, it allows easy flow of information and risk monitoring system that are appropriate (Wokocha, 2010). It has however been observed contrary to that, the level of accuracy, timeliness, efficiency and effectives has not been fully realized despite the existing structures of ICT. Bearing in mind the tasks of managing a big number of students in small examination rooms, the exercise become tedious and at times marred with examination malpractices, consequent loss of exams marks yet with application electronic set exam, there could be an easy monitory of students and marking coupled with security for results with electronic databases. Software for managing examination in school has been developed for use by administrators to play

examination roles for administrators, teachers and students. However, the level of accessibility to the possible platforms needed to be established, thus necessity for this study.

However, in discussing the assessment, it is valuable to consider the type of learning which can be measured, and particularly, which types currently lend them to computer assisted assessment. There has been a growth of computer-aided assessment over recent years. It is widely accepted that Bloom provides a sensible taxonomy of educational objectives that apply to most academic subjects (Bloom, Krathmohl, 2002). In current practice, e-assessment can be applied to test the so-called lower order skills (knowledge, comprehension and application) (Okonkwo, 2015). However possible this would be, it is not clear whether all teaching staff have got the required skills to apply ICTs in assessment, it also not clear whether all individual teachers could have access to required platforms to put to use the e-assessment, so the level of accessibility of ICTs for examination management needed to be ascertained.

Educational institutions are under increased pressure to do more with less and optimize management through the use of innovative technologies. It is thus unfortunate that in the world of ICT-lead innovation, assessment usually fails to raise much enthusiasm, (Arinze, Iwunor, 2012). However, ICT is much in teaching than testing and managing exams, yet testing and examination management is a vital component of education as a whole. However, the application of ICT is not a matter of being imported and used. Instead, it requires a specific level of knowledge and skills before one would be able to operate the equipment properly and it will depend on a specific level of applicability. This research therefore to establish the levels of accessibility of ICTs in the schools management exercise.

Problems of ICT resources in teaching and leaning

Ugbah and Omorojie (2010) commented that although ICT resources have revolutionized all aspects of human and organization life. It has brought about increased human and industrial problems like pollution, fraud; armed robbery etc. Long distance telephone connections are often poor and static. It is frustrating and time consuming that one finds it difficult to just speak to colleagues/students on phone for a distance of few kilometers.

Stimulus – Response theory of learning formulated by Thorndike (1874-1949). He was an American psychologist; who strongly influenced education toward social utility through his experimentally derived theories of learning-**CONNECTIONISM**. It is based on Stimulus–Response bonds otherwise known as “S-R bonds”. He believed that learning comes through the application of the right response bonds otherwise known as “S-R bonds”. He believed that learning comes through the application of the right response (R) to given stimulus (S). He further

argued that there is always union bond or connection between a given stimulus and a given response which occurs as a result of biological changes taking place in the nervous system of the organism.

To back up his stand, Thorndike connected experimentation with monkeys where learning came about through stamping in correct responses and stamping out incorrect ones. For example, in typewriting when the learner sees the printed letter, he gets his stimulus; his striking the identical letter is the response. When the learner once spells consensus with an S, the synapses between the neurons are strengthened, so that subsequent S-R responses will be identical. The more one utilizes certain neural pathways, the stronger become the bonds. The best way to establish a habit is to make many repetitions of the exact responses of the fixed. Thorndike stressed the mechanistic aspect of behaviour and rejects the traditional dualism of mind and matter. This theory minimizes the role of understanding and insight in learning; it emphasizes neural reaction rather than perception. Three of his Laws of Learning (Readiness, Exercise, and Effect) are, however, important to any teacher of any subject.

Based on this theory, availability and proper use of ICT resources in teaching and learning in secondary schools will make teaching and learning to be more meaningful and purposeful. Hence, practice exposes an individual to the possibility of learning by providing learning opportunities and emphasized the importance of repetition.

For the purpose of this research work, the law of Exercise and effect is suitable in the sense that this law held that ‘practice makes A perfect.

The importance of this theory of learning in the classroom is that:

- i. The laws of learning should apply to the motor skills, such as typesetting or machine operation. Connectionism advocates that learning is the establishment of correct responses to stimuli and is mechanistic.
- ii. It emphasizes trial and error.
- iii. It emphasizes practice in typesetting in order to strengthen the S-R bonds.
- iv. Appropriate teaching aids such as ICT resources and other learning materials should be used to assist learners grasp all ideas being taught (Obi 2005).

Methodology

This study employed a survey research design. The study was carried out in ten (10) secondary schools in Bwari Area Council, Federal Capital Territory Abuja.

Bwari Area Council is suitable for this study because of the population increase of the area and the researcher is familiar with the environment. The population for this study covers all the secondary schools students and teachers in the entire Bwari Area Council. The total population of the study is two thousand and fifteen (2015) students. Simple random sampling technique was used to select 120 respondents from the population of 2015 students in 10 secondary schools in Bwari Area Council, Abuja. A researcher designed questionnaire titled Questionnaire on Availability and Usage of Information and Communication Technology Resources in Teaching and Learning in Secondary Schools (QUICTRTLSS) consisting of four Likert rating of Strongly Agreed, Agreed, Disagreed and Strongly Disagreed was used for the study. It contained 40 structured item questions while a reliability coefficient of 0.05 was obtained from a test-retest process.

Analysis

The data collected from the respondents were analyzed using Mean and standard deviation. The null hypotheses were tested using t-test statistic at 0.05 level of significance. Where the t calculated is greater than or equal to critical value of t, the hypothesis was rejected, but if otherwise it was accepted.

Research Question One:

What are the ICT resources available for teaching and learning in secondary school in Bwari Area council FCT Abuja?

The items dealing with the ICT resources available for teaching and learning in secondary school in Bwari Area council FCT Abuja covered items 1 to 20 on the questionnaire and the data revealed that nine out of 20 ICT resources had their mean values ranged from 3.52 to 3.89. This showed that the mean value of each resource was above the cut-off point of 3.50, indicating that only eleven ICT resources were available for teaching and learning in secondary school in Bwari Area Council FCT Abuja. The remaining nine resources presented were not available for teaching in education.

Research Question Two:

Do teachers use the available ICT resources in the teaching and learning in secondary school in Bwari Area council FCT Abuja?

The items dealing with whether teachers used the available ICT resources in the teaching and learning in secondary school in Area council FCT Abuja, covered items 21 to 40 with the data revealed eight out of 20 ICT resources had their mean values ranged from 3.50 to 3.71. This showed that the mean value of each item was above the cut-off point of 3.50, indicating that only eight ICT resources out of 20 were often used as available ICT resources in teaching and learning in secondary

school in Bwari Area council FCT Abuja. The remaining 12 ICT resources were never utilized.

Hypothesis One

There is no significant difference in the Mean ratings opinion of teachers and students on the ICT resources available for teaching and learning in secondary schools in Bwari Area Council FCT Abuja.

Table 1

Comparisons of z-test Differences between the Mean Ratings of Teachers and Students uses of ICT Resources in Teaching and Learning in Secondary Schools in Bwari Area Council FCT Abuja

S/ N	Group	Mea n	SD	N	D F	S.E	t-cal	t- critical	Level of Sig.	R M
1.	Teacher s	4.15	0.9 5	12						
						0.1 1	0.82	1.52	0.05	NS
2.	Students	4.06	0.9 9	18	2 8					

Table 1 showed that the t-test analysis of t-cal has 0.82 values which is less than the t-critical of 1.52 at 0.05 level of significance. This indicated that there was no significant difference between the mean ratings of teachers and students on the uses of ICT resources in teaching and learning in Bwari Area Council FCT Abuja. Therefore, the null hypothesis of no significant difference in the mean ratings of teachers and students on the uses of ICT resources in teaching and learning in secondary schools in Bwari Area Council FCT Abuja was upheld.

Hypothesis 2

There is no significant difference in the Mean ratings of teachers and students on the contributions of ICT resources to the teaching and learning in Bwari Area Council FCT Abuja.

Table 2

Comparisons of z-test Differences between the Mean Ratings of Teachers and Students on the Contributions of Information and Communication Technology Resources to the Teaching and Learning in Secondary Schools in Bwari Area Council FCT Abuja.

S/N	Groups	MEAN	SD	N	DF	S.E	t-cal	t-critical	Level of Significance	Remark
1.	Teachers	3.89	0.88	12	28	0.09	0.67	1.52	0.05	NS
2.	Students	3.83	0.75	18						

Table 2 showed that the t-test analysis of t-cal has 0.67 values which is less than the t-critical of 1.52 at 0.05 level of significance. This indicated that there was no significant difference between the mean ratings of teachers and students on the contributions of information and communication technology resources to the teaching and learning in secondary schools in Bwari Area Council FCT Abuja.

Discussion of Findings

It was discovered from the findings that ICT resources were available in all the schools used for this study as revealed from the analysis. This is in line with the work of Eady and Lockyer (2010) that an integrated design of learning resources using ICT is an important part of the instructional process that helps achieve expected learning outcomes.

According to Jimoh (2010), it is not just supplementing learning but to complement it process. The use of ICT in teaching and learning is becoming wider in scope today to our schools nationwide. ICT resources is not only restricted to its usage as instructional materials inform of teaching aid but has become a tool to reshape knowledge delivery and hence both teachers and students activities in the classroom. It is then shown that if there must be an effective teaching and learning activity then utilization of ICT instructional materials will be necessary.

Conclusions

In conclusion, this study had looked into the Availability and usage of ICT resources in secondary schools in Bwari Area Council, Abuja and found out that though some resources were available but not enough for teaching and learning, and the available ones are not well utilised by both the teaching and students for teaching and learning. ICT resources were not enough in supply for teaching and learning in secondary schools in Bwari Area Council FCT Abuja, While the available ICT resources were not utilized well enough for teaching and learning in secondary schools in Bwari Area Council FCT Abuja of ICT resources will contribute to the teaching and learning in secondary schools Bwari Area Council FCT Abuja.

Recommendations

Based on the findings of the study and the conclusions made, the following recommendations were made:

- (1) Relevant information and communication technology resources for teaching and learning activities should be provided by government and philanthropists in the society.
- (2) Access to ICT resources should be given to both the students and the teachers for often use.
- (3) Workshop, seminars and short time training should be organized for teachers by school administrators and government in order to improve their skills in using all kinds of ICT resources for teaching and learning and should be encourage to use the available ones.

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