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Assessment of ICT Facilities in Public High Schools in Nigeria

Ismaila M. Folashade *
Ismaila W. Oladimeji **
Olajide Anthony T. ***
Akinrinade Sola A. ****

Abstract

Information and communication technology (ICT) refers to processing and sharing of information using all kinds of technologies for the manipulation and communication of information. To improve high school education is essential to the creation of effective human capital in any country (Evoh, 2007). This study assessed the ICT facilities in public high schools in Osun state, Nigeria.
Twenty-four schools constitute the population within which the research was conducted with about five hundred teachers. A 24-item structured questionnaire was used as instrument for data collection which was administered on 270 teachers. 199 answered questionnaires were returned representing 99.5 percent. Data collected were analyzed using ANOVA at a $p<0.05$ level of significance. The findings revealed that there are no enough ICT facilities for teaching and learning. Also, the results of ANOVA showed that (i) there are no enough ICT facilities for teaching and learning; (ii) the students face challenges with the use of ICT facilities (iii) that the use of ICT facilities has effects on teaching and learning of the students and (iv) that teachers do have knowledge on the use of ICT facilities in the public high schools in Osun state. Therefore, the study recommended that in order to justify the huge spending of Osun state government of provision of ICT facilities, the public high schools should be equipped with adequate ICT facilities (not only computers) that cut across all levels of high school in order to enhance modern methods of impacting knowledge to students.

Keywords:

ICT, ANOVA, Osogbo metropolis, high school, Likert scale

Author correspondence:

Ismaila M. Folashade,
Department of Computer Science,
Osun State Polytechnic, Iree, Nigeria.
Email: woismaila@lautech.edu.ng, folaismaila@gmail.com,tonyvickky2005@gmail.com oluwabukolamary18@gmail.com

1. Introduction

According to [7], ICT is a revolution that involves the use of computers, internet and other telecommunication technology in every aspect of human endeavors. Similarly, [14] also define ICT as electronic or computerized devices, assisted by human and interactive materials that can be used for a wide range of teaching and learning as well as for personal use. Across the past twenty years the use of ICT has fundamentally changed the practices and procedures of nearly all forms of endeavour within business and governance. The use of ICT facilities in education lends itself to more student-centred learning settings. It

provides teachers with a range of new tools to facilitate traditional pedagogies; it also and perhaps more importantly, presents the teacher with the potential to develop new teaching methods. For the student growing up in a culture of all-pervasive technology, ICT provides new, and more exciting and relevant, learning opportunities.But with the world moving rapidly into digital media and information, the role of ICT facilities in education is becoming more and more important. It is no longer possible nowadays to conceive of education without ICT. One can go even further by pointing out that education is increasingly being defined by ICT.

Looking at the role of education in the national building and the population explosion in high schools these days, the use ICT facilities in the teaching and learning process becomes imperative. This is because its adoption by teachers will enhance effective teaching. Issues like good course organization, effective classroom management, self-study collaborative learning and effective communication between the actors of teaching-learning process and research activities will be enhanced by the use of ICT based technology. [5]. The various ICT facilities used in the teaching and learning process in high schools include; radio, television, computers, overhead projectors, optical fibres, fax machines, internet, electronic notice board, slides, digital multimedia, video machine and so on. It appears some of these facilities are not sufficiently provided for teaching and learning process in the high schools.

There are developments in the Nigerian education sector which indicate some level of ICT application in high schools teaching and learning processes. The Federal Government of Nigeria, in the National Policy on Education (Federal Republic of Nigeria, 2004), recognizes the prominent role of ICTs in the modern world, and has integrated ICTs into education in Nigeria. To actualize the goal, the National Policy on Education (2004) states that, government will provide basic infrastructure and training at the primary level, at the junior secondary level, computer education has been made a pre-vocational elective and is a vocational elective at the senior secondary level. [15], concluded that computer is not part of classroom technology in more than ninety percent of Nigerian public schools. This implies that the chalkboard and textbook continues to dominate classroom activities in most Nigerian secondary schools. The Federal Ministry of Education has launched an ICT-driven project known as school net www.snng.org [10], [2], [15], which was intended to equip all schools in Nigeria with computers and communication technologies. The Ministry of Education has also acknowledged that the challenge of providing modern technologies to schools to enhance the quality of learning and teaching will require significant financial and human resources investment. In order to corroborate the federal government efforts, the Osun state government in 2011 embarked on massive project worth tens billions of naira to acquire ICT equipment for students of highest classes in public high schools.

However, the use of these technologies by these schools remains aproblem. In some schools some of the ICT facilities that have been delivered and still remained in boxes, uninstalled and unutilized. A case in point is the school where the researcher teaches, where a large flatscreen television has remained in its packaging since 2008, and a satellite dish remained uninstalled. In some schools computers are mainly used to play games by students and teachers in their “free time”. Thus, despite the fact that the government has not provided enough ICT facilities in high schools in Osogbo metropolis, few schools have neither implemented nor utilised these facilities effectively. In other words, the existence of the gap between provision of ICTs and the capacity of teachers and school management to utilise them present an important challenge for both education researchers and education planners.

The purpose of this study is to carry out the assessment of ICT facilities in high schools in order to devise means by which how qualitative and quantitative improvements can be accomplished in high schools through effective provision and utilization of ICT facilities.

History of ICT Utilization in Nigerian Public Schools

The political condition in Nigeria for as far back as thirty 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 [3].
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 [4].

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 [9]. 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 [3]. In order to corroborate the federal government efforts, the Osun state government in 2011 embarked on massive project worth tens billions of naira to acquire ICT equipment for students of highest classes in public high schools. 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 most schools both private and public do not have ICT training courses [11].

2.0 RELATED WORK

Authors in [2] in their work focused on ICT application in Nigerian secondary schools. It particularly dwells on the importance of ICT and the causes of low levels of ICT application in Nigerian secondary schools. Recommendations for improvement are offered. Adebowale and Dare in 2012 designed to investigate the level of awareness of primary and secondary school teachers invited for a capacity building workshop on ICT of Nigeria‘s educational policy on ICT as well as its possible influence on the use of ICT for classroom teaching and learning. Two hundred volunteers (out of the 250 participants invited from all the Local Government Areas of the state) at an ICT training workshop organized for Oyo state (Nigeria) teachers participated in this study. Data was collected using a self-constructed and validated questionnaire titled “Teachers awareness of Nigeria‘s educational policy on ICT” and the data were analyzed using simple percentage, t-test and ANOVA. The study found that only a small percentage of the respondents possess a high level of awareness of the country‘s educational policy on ICT, in fact, a considerable proportion of the respondents (35.1%) of the respondents were either completely ignorant of the policy or possess poor levels of its awareness.

In 2013, [6] examined the availability and utilization, the benefits and challenges of ICT facilities in teaching and learning vocational and technical education in Yobe state technical college. Descriptive survey design was used for the study. The study revealed that ICT facilities were lacking in technical colleges. Teachers and Students exposure to ICT facilities was low. The study revealed that some of the benefits of using ICT in technical college include making teaching and learning interesting; helping teacher to be up to date in enhancing the quality of work of both teachers and students. Despite these benefits, the study revealed some of the challenges facing ICT as: irregular power supply; inadequate computer literate teachers; inadequate ICT facilities. [16] investigated the availability of common educational ICTs in secondary school, using a high school in Kwekwe, Zimbabwe as the case study. They also assessed whether the available ICTs are being utilized by teachers and students looking at such usage activities as preparation for lessons, lesson delivery, issuing of assignment, research and communication. The research further identify the factors that are hindering the ICT utilization in these schools, among them are lack of power supply, insufficient resources, fear of technologies, lack of internet, ICT skills deficiency, higher ICT cost and poor physical infrastructure.

Authors in [12] carried out to determine the impediments to integration of ICT in teaching and learning mathematics in secondary schools in Imo state. Based on the objective of the study, two research questions and a hypothesis guided the study. A sample of 150 mathematics teachers comprising of 60 males and 90 females were used for the study. Descriptive survey research design was adopted in carrying out the research. A four point type likert questionnaire instrument with reliability coefficient of 0.77 determined through test-retest method was used in data collection. Generated data was analyzed using mean, standard deviation and t-test statistical tools tested at 0.05 level of significance. The study revealed among other factors, teachers negative attitude, competence, and confidence, poor policy implementation, lack of time ,lack of personnel, etc, hindered the implementation of ICT in teaching and learning of mathematics in secondary schools. In 2017, [13] investigated the availability and utilization of ICT resources in teaching computer education in secondary schools in Anambra State. Two research questions guided the study. The population consisted of 450 computer teachers teaching computer education in the schools. From the population, 350 computer teachers were sampled and used for the study. The instrument for data collection was a self -developed 40-item questionnaire. It was validated by experts and the reliability co-efficient stood at 0.79. The data collected were analysed using frequencies and percentages. The findings revealed that many of the ICT resources needed for the teaching of computer education are not available. It was also revealed the majority

of the resources needed for the teaching of computer education are not being used by the teachers.

3.0 Problem Statement

Despite the efforts made by federal government to furnish all public schools in the country with computers and other ICT gadgets more than 90% of the schools, the educational activities remain manual [3]. In order to corroborate the federal government efforts, the Osun state government in 2011 embarked on massive project worth billions of naira to acquire ICT equipment for students of highest class in public high schools. Despite the fact that efforts have been made to ensure the accessibility and practical use of ICT facilities in public schools, still these have not reflected in the performances of students in both internal and external examinations.

Research Purpose

This study determines:

A.. The availability of ICT resources for teaching and learning in Government High schools in Osun State.

B. The ICT resources being utilized or not utilized by teachers in the teaching and learning Government high schools in Osun State..

Research Questions

A. Is there enough ICT facilities in Government High schools in Osogbo metropolis for teaching and learning?
B. Do students in Government High Schools in Osun state facing challenges with the use of ICT facilities?
C. Does the use of ICT facilities in Government High schools in Osun state has any effects on teaching and learning of the students?
D. Do Teachers in Government High schools in Osun state have knowledge on the use of ICT facilities?

Research Hypothesis

The following hypotheses were formulated to guide this study.

H_{01}: There is enough ICT facilities in Government High schools in Osun state for teaching and learning?
H_{02}: Students in Government High Schools in Osun state are not facing challenges with the use of ICT facilities?
H_{03}: The use of ICT facilities in Government High schools in Osun state has no effects on teaching and learning of the students?
H_{04}: Teachers in Government High schools in Osun state have no knowledge on the use of ICT facilities?

4.0 Research Method

This section described the population of the study, sample and sampling technique, the instrument for data collection, and method of data analysis.

Population of the Study

There are twenty-four high schools in Osogbo metropolis. Some of these public schools are situated in both urban and rural areas. The research population comprises of about 500 teachers. The research focused mainly on teachers and principals.

Sample and Sampling Technique

A sample of ten high schools were selected from the 24 high schools in Osogbo metropolis. 200 teachers were randomly sampled. The rationale was in line with Nwana (1982) who states that 'if the population of the study is in a few hundreds, a 40% or more sample will be adequate; if many hundreds, a 20% sample willdo; and if several thousands, a 5% or less sample will do. Since the population of thisstudy amounts to 500 school administrators, which is equivalent to few hundreds, about 50% of the population was selected as the sample size.

Instrument for Data Collection

A structured questionnaire titled, Assessment of ICT facilities in high schools was used in this study. The questionnaire consists of two Parts: Part I seeked information on the demographic data of the respondents while Part II contained 24 items built in four clusters (A-D) in line with the four research questions. Cluster 'A' collected data on the presence of ICT facilities in the selected high schools; cluster 'B' is concerned with

the extent to which ICT facilities are being used for teaching and learning; cluster 'C'collected data on the effect of ICT facilities on teaching and learning; while cluster 'D' is concerned with the challenges facing ICT facilities in high schools. A 4-point rating scale was provided for Clusters A, B, C and D viz; strongly agree (SA), agree (A), disagree (D) and strongly disagree (SD), also weighted 4 points, 3 points, 2 points and 1 point respectively.

Method of Data Analysis

Data was analyzed using ANOVA (Analysis of Variance).

5.0 Discussion of Results

This aspect of research study dealt with the analysis of the collected data and testing of the set hypothesis at $p < 0.05$ level of significance. Data collected were subjected to ANOVA in statistical package for social sciences (SPSS).

A. Respondents Analysis

94 (48.0%) of the respondents have 1-5 years of experience, 32 (16.0%) respondents have 6-10 years, 38 (19.0%) respondents have 11-15 years, 32 (16.0%) respondents have 16-20years, while 4 (2.0%) respondents have 20-25 years of experience.

B. Availability of ICT Facilities

The results of the Likert scale on the rating of availability of ICT Facilities in high school depicted that (i) 68.0% disagreed that there are enough computers to teach students, (ii) 84.0% disagreed that television sets are available for teaching students, (iii) 52.0% disagreed that the school is connected to the internet and (iv) 84.0% disagreed that there are interactive boards for teaching students.

C. Use of ICT Facilities

The results of the Likert scale on the rating of use of ICT facilities in high school depicted that (i) 58.0% disagreed that teachers are exposed to the use of ICT facilities in teaching students (ii) 58.0% disagreed that students are given opportunities to use ICT facilities in class/laboratories (iii) 53.0% disagreed that training is organized for teachers on the use of ICT facilities

D. Effects of ICT Facilities on Teaching and Learning

The results of the Likert scale on the rating of the effects of ICT Facilities on Teaching and Learning in high school depicted that (i) 87.0% of the respondents agreed that ICT helps in making teaching-learning more effective, (ii) 86.0% of the respondents agreed that ICT enhances quality of work of both teacher/students (iii) 91.0% of the respondents agreed that ICT can develop students inquiry skills (iv) 89.0% of the respondents agreed that ICT can motivate students to work collectively in the class (iv) 89.0% of the respondents agree that ICT encourages students in" learning by doing'.

E. Challenges Facing ICT Facilities in High Schools

The results of the Likert scale on the rating of the challenges facing ICT facilities in high schools produced that (i) 88.0% of the respondents agreed that most secondary schools lack computer literate teachers (ii) 68.0% of the respondents agreed that there is lack of ICT laboratories in the schools (iii) 74.0% of the respondents agreed that Irregular power supply hinders the use of ICT facilities where they are available (iv) 60.0% of the respondents agreed that the cost of purchasing computers is high (v) 91.0% of the respondents agreed that there is no adequate security for ICT facilities.

Analysis of ANOVA Outputs

The table 1 showed part of the results of implementing ANOVA on the sample data based on the research questions. The analyses are as follows:

Table 1: ANOVA outputs on Research questions

Research Questions	Sum of Squares	Mean Square	Calculated F	Table F	Sig.
A	0.539	0.539	4.478	2.793	.490
B	4.194	2.097	3.040	3.00	.133
C	16.280	4.070	7.182	2.37	.000
D	1.162	1.162	1.400	3.84	.238

Research Question A*: Is there enough ICT facilities in Government High schools in Osun state for teaching and learning?*
From table 1, the calculated value of 4.478 exceed the table value of 2.793 and $p > 0.05$, H_{01} is rejected. Hence there is no enough ICT facilities in Government High schools in Osun state for teaching and learning.
Research Question B*: Do students in Government High Schools in Osun state facing challenges with the use of ICT facilities?*
From table 1, the calculated value of 3.040 exceed the table value of 3.00 and $p > 0.05$, H_{01} is rejected. This showed that students in Government High Schools in Osun state do face challenges with the use of ICT facilities. Such challenges are lack of computer expert teachers in most secondary schools, lack of ICT laboratories, irregular power supply, cost of purchasing computers etc.

Research Question C: *Does the use of ICT facilities in Government High schools in Osun state has any effects on teaching and learning of the students?*
From table 1, the estimated value of 7.182 exceed the table value of 2.37 and $p > 0.05$, H_{03} is accepted. This implies that the use of ICT facilities in Government High schools in Osun state do has effects on teaching and learning of the students.
Research Question D: *Do Teachers in Government High schools in Osun state have knowledge on the use of ICT facilities?*
From table 1, the estimated value of 1.40 is less than the table value of 3.84 and $p > 0.05$, H_{04} is rejected. This implies that teachers in Government High schools in Osun state do have knowledge on the use of ICT facilities.

6.0 Conclusion

This paper is of value and importance to those in high school in that it assesses the availability and extent of use of technology by learners, teachers and principals and whether or not these affect teacher and learner performance in Osun state. Based on the findings of the study, the following were concluded: there are no enough ICT facilities for teaching and learning in High Schools of Osun state; students of High School in Osun state face challenges in the use of ICT facilities, such challenges are lack of computer expert teachers, lack of computer laboratory, irregular supply of electricity, inadequate security for ICT facilities, cost of purchasing the ICT facilities etc; the use of ICT facilities has effects on teaching and learning; and most teachers of high schools in Osogbo metropolis have knowledge of ICT. Hence the provision of laptop computers for senior secondary school students could not alone facilitate improvement in teaching and learning because of lack of contributions of other ICT facilities. It is hoped that this study will motivate the government of Osun state to provide enough ICT facilities, that is, ICT facilities that is not one sided, for learning and teaching.

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