

AVAILABILITY AND UTILIZATION OF ICT AND E-LEARNING RESOURCES FOR SCIENCE TEACHING IN OSUN STATE SECONDARY SCHOOLS

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Abstract

The study assessed the availability of ICT/e-learning resources for teaching the science subjects in public schools in Osun State; It also investigated the extent of teachers' use of ICT/e-learning resources in the science classrooms and examined the challenges faced by science teachers in using ICT/e-learning resources for teaching in Osun State public schools. The study adopted descriptive survey research. The population for the study comprised of science teachers (Biology, Chemistry and Physics) in Osun State public high schools. The study sample consisted of 108 Science teachers selected using multistage sampling technique. The instrument used to collect data for the study is a questionnaire titled "Teachers Utilization of ICT Resources (TUICT)". Data collected were analysed using frequency counts and percentages. The results showed that ICT/e-learning resources were not available for teaching in the public schools in Osun state. Only 16.67 % of schools have ICT resources while 74.07% do not have ICT resources. Result also showed that many of the secondary school science teachers (86.85%) do not make use of ICT resources for science teaching. Result indicated that only android tablet is the ICT resource that is available for teaching. Result further showed that the challenges of non-availability of ICT resources (66.67%) ; non availability of fund to purchase and maintain ICT resources (86.11%); non- availability of power supply (74.07%) and inadequate availability of ICT resource (69.44%) are the challenges faced by science teachers in using ICT/e-learning resources in the classrooms. The study recommends that science teachers should try to upgrade their knowledge and get new ideas that can make them to be able to use ICT resources to teach in science classrooms; Government should endeavour to make available ICT resources in public schools in Osun State and employers of labour should always organise training programmes like seminars, workshop, Conferences and in-service training for science teachers.

Key words: Information and Communication Technology (ICT), E-learning, Availability and Resources.

Introduction

Information and Communication Technology (ICT) is a diverse set of Technological tool and resource [es used to communicate and create, disseminate, store and manage information. ICT is an information handling tool that is used to produce, store, process, distribute and exchange information. It encompasses a range of applications, communications and technologies which aid information retrieval, research communication and administration. ICT is an electronic based system of information transmission, reception, processing and retrieval which has drastically changed the way we think,

the way we live and the environment in which we live. (Ogunsola, 2005)

ICT has become a global phenomenon of great importance and concern in all aspects of human endeavour, spanning across education, governance, labour, business, marketplace, agriculture, commerce among others. It has an impact on nearly every aspect of our live from working to socialising, learning to playing. The digital age has transformed the way young people communicate, network, see help, access information and learn. Many countries of the world now regard the mastering of the basic skills and concepts of ICT as an inevitable part of the

core of Education as it has become one of the fundamental building blocks of modern society. To this end various new models of education are evolving in response to the new opportunities that are becoming available by integrating ICT and in particular Web-based technologies into the teaching and learning environment (Ogunsola, 2005). Abimbade (2006) described Information and Communication Technologies as essential tools in any educational system. They have the potentials of being used to meet the learning needs of individual student, promote equality of educational opportunities; offer high quality learning materials; increase self-efficacy and independence of learning among students, and improve teachers' professional development.

ICT is widely recognised that learners are motivated and purposefully engaged in the learning process when concepts and skills are underpinned with technology and sound pedagogy. Mar-ikemenjima (2005) said that ICT enhances administrative functions of teaching and learning, which in turn has a direct impact on pedagogy.

The role of E-Learning in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary educational policy. ICT in education can be understood as the application of digital equipment to all aspects of teaching and learning. It is being used in almost all schools in advance countries of the world. Several research studies have indicated that when properly used, ICT holds a great promise to improve teaching and learning. (Kwasha, 2007, Kubiato and Halakova, 2009). Students taught with ICT/E-learning gain deeper understanding of complex topics and concepts and are more likely to recall information and use it to solve problems outside the classroom. In addition, through ICT, students extend and deepen their knowledge, investigation and inquiry according to their needs and interest when access to information is available on multiple levels. (Ajadi, Salawu and Adeoye, 2008).

According to Okanlawon & Ayoade (2014), the use of ICT in teaching is a relevant and functional way of providing education to learners that will assist in imbibing in them the required capacity for the world of work. ICT offer some reprieve from

the confines and constraints of conventional classrooms. They afford teachers a wide variety of opportunities to re-think and re-engineer the nature of our teaching and learning practices. For example, various technology software serve different purposes in the classroom; word processing and e-mail can promote communication skills; database and spreadsheet programme can promote organization skills and modelling software can promote the understanding of science and Mathematics concepts. Word processing allows materials to be shared easily among teachers. e.g. teachers can make corrections to word processing documents more quickly than they could on typewriter or by hand. With word processing, students can also share ideas and product among themselves.

Spreadsheets package can be used by teachers in preparing students results so as to compete almost on the same footing with their counterparts in other parts of the world. Spreadsheets are normally used by teachers to manage students' grades and results.

Teachers can explore the internet to obtain information which will broaden their knowledge and assist their teaching. They can make use of flash drive to store information and use them later. Teachers can also make use of the internet when preparing lesson so that they will be able to be in touch with what their counterparts all over the world are doing and also be able to have first-hand information on current trends and best practices in their profession. Teachers can also download experiments on-line and use them to teach their students to improve their understanding of scientific concepts. Teachers can record their teachings and demonstrations of experiments on video for the students either before the normal class teaching to serve as advance organizers or even after the class teaching to serve as effective tool for remembering concepts taught in the classroom.

According to Ololube, Ubogu and Ossai (2007), the introduction of ICT usage, integration and diffusion has initiated a new age in educational methodologies, thus it has radically changed the traditional method of information delivery and usage patterns in the domain as well as offering contemporary learning experience for both teachers and students. However, the effective

integration of ICTs into the classroom depends to a large extent on teachers' ability and familiarity with the IT learning environment. According to Aladejana (2007) there have been very little efforts in the integration of ICT into Nigerian secondary school classroom. Has the situation changed now? Despite the enormous importance of ICT resources in education, it is not likely that science teachers in Osun State are making use of these resources in teaching. This study therefore intends to investigate the extent of the use of ICT resources by science teachers in the science classrooms in Osun State.

Purpose of the Study

The aim of this study is to investigate the availability and the extent of Utilization of ICT resources in teaching and learning of science subjects (Biology, Chemistry, and Physics) in public schools in Osun State. The specific objectives of the study are to:

- (i) assess the availability of ICT/e-learning resources for teaching the science subjects in public schools in Osun State;
- (ii) investigate the extent of teachers' use of ICT/e-learning resources in the science classrooms; and
- (iii) examine the challenges faced by science teachers in using ICT/e-learning resources for teaching in Osun State public schools.

Research Questions

The study provided answers to the following questions

- (a) How available are ICT/E-learning materials for teaching science subjects in the public secondary schools in Osun state?
- (b) What is the extent of teachers' utilization of ICT/E-learning resources in the science classroom in Osun state?
- (c) What are the challenges faced by science teachers in using ICT/e-learning resources for teaching in Osun state secondary schools?

Methodology

The study employed the descriptive survey research design. The population for the study consisted of all the science teachers (Biology, Chemistry and Physics) in the public secondary schools in Osun state. The sample consisted of 108 science teacher's selected using multistage

sampling technique. There are three senatorial districts in the state, three Local Government each were selected from the senatorial districts using simple random technique. From each local government area, four secondary schools were selected using simple random sampling technique and from each school, the science teachers (Biology, Chemistry and Physics) were purposefully selected making a total of 108 science teachers.

The instrument used to collect data for the study was a questionnaire titled "Teachers utilization of ICT" (TUICT) for teaching science subjects. The questionnaire consists of four sections. The first section dealt with demographic variables of the respondents which include sex, qualification, years of teaching experience and level of computer literacy. Section B sought for availability of ICT/e-learning resources in the schools; while section C contained questions that sought for the extent of science teachers' utilizing ICT/e-learning resources in teaching Biology, Chemistry or Physics subjects and section D sought after the challenges faced by the teachers in using ICT resources for teaching and learning. The instrument was validated by an expert in Test and Measurement in Faculty of Education, Obafemi Awolowo University, Ile-Ife who examined the items in the questionnaire and the objectives of the study and make some suggestions. His suggestions were used for further revision of the instruments.

Data Collections and Analysis

The researcher and one research assistant visited the secondary schools selected for the study, and sought for the cooperation of the science teachers in responding to the items in the questionnaire. The questionnaire were administered to the respondents and collected back after ensuring that all the items have been attended to. The study lasted for six weeks. The data collected were analysed using frequency counts and percentages.

Results

Research Question one: Are ICT resources/facilities available for teaching the science subjects in Osun state public secondary schools?

Table 1: Availability of ICT Resources for science teaching in Secondary Schools

S/N	Items	Available		Not Available	
		Frequency	(%)	Frequency	(%)
1	Desktop Computers	100	92.59	08	7.41
2	Lap top computers	0	0.0	108	100.0
3	Overhead projector	05	4.63	103	95.37
4	Video player	06	5.56	102	94.44
5	Internet connections	04	3.70	104	96.30
6	Printer	65	60.18	43	39.82
7	Android Tablet	96	88.89	12	11.11
8	Television set	75	69.44	33	30.56
9	Radio set	12	11.11	96	88.89
10	Video conferencing	04	3.70	104	96.30
11	Public address system	05	4.63	103	95.37
12	Digital Multimedia	03	2.77	105	97.22
13	Scanner	20	18.52	88	81.48
14	Flash Memory	10	9.26	98	90.74
15	Stand by generator	15	13.89	93	86.11
	AVERAGE	207	16.67	1200	74.07

Table 1 showed that 16.67 % of schools have ICT facilities while 74.07% do not have ICT facilities. Desktop computers (92.59%), Tablet (88.89%) and Television set (69.44%) are the most available ICT facilities in schools.

Research Question two: What is the extent of teachers' utilization of ICT/E-learning resources in the science classroom in Osun state?

To answer this question the responses of science teachers (Biology, Chemistry and Physics) on the use of ICT resources in the science classroom were analysed using frequency counts and percentages. The result obtained is presented in table 2.

Table 2: Science Teachers use of ICT resources in the classroom

S/N	Items	Often Used		Seldom use		Never Used	
		Frequency	(%)	Frequency	(%)	Frequency	(%)
1	Desktop Computers	06	5.56	21	19.44	81	75.0
2	Lap top computers	00	0.0	00	0.0	108	100
3	Overhead projector	00	0.0	03	2.78	105	97.22
4	Video player	00	0.0	02	1.85	106	98.15
5	Internet connections	00	0.0	00	0.0	108	100
6	Printer	20	18.5	45	41.67	43	39.82
7	Android Tablet	36	33.33	60	55.56	12	11.11
8	Television set	00	0.0	00	0.0	108	100
9	Radio set	00	0.0	00	0.0	108	100
10	Video conferencing	00	0.0	00	0.0	108	100
11	Public address system	00	0.0	00	0.0	108	100
12	Digital Multimedia	00	0.0	00	0.0	108	100
13	Scanner	00	0.0	00	0.0	108	100
14	Flash Memory	00	0.0	05	4.63	103	95.37
15	Stand by generator	00	0.0	15	13.90	103	86.11
	AVERAGE	62	3.82	151	9.32	1407	86.85

Result in table 2 above showed that many of the secondary school science teachers (86.85%) do not make use of ICT facilities for science teaching. Result indicated that only android tablet is the ICT resource that is available for teaching but not even in all the sampled schools. Most other facilities were not being used at all or more so they are not available in the schools. The findings of this study

revealed that ICT facilities are not made available for teaching the science subjects in the public schools.

Research Question Three: What are the challenges faced by science teachers in using ICT/e-learning resources for teaching in Osun state secondary schools.

Table 3: Challenges faced by Science Teacher in Using ICT Resources for science Teaching

S/N	Items	Yes (%)	No (%)
1	Non availability of ICT resources	72 (66.67%)	36 (33.33%)
2	Inability of teachers to use the resources	08 (7.41%)	100 (92.6%)
3	Non availability of power supply	80 (74.07%)	28 (25.93%)
4	Large population of students	20(18.52%)	85(81.46%)
5	Non availability of fund to purchase and maintain ICT resources	93(86.11%)	15(13.89%)
6	Lack of seminar/workshop to train teachers on the use of ICT resources in teaching and learning	60 (55.56%)	48 (44.44)
7	Unawareness of Science teachers on the use of ICT resources for teaching	20 (18.52%)	88 (81.46%)
8	Inadequate availability of ICT resources in the School	75 69.44%)	33 (30.56%)
9	Poor knowledge of science teachers on the use of ICT facilities for teaching	10 (9.30%)	98(90.74%)
10	No ICT laboratory in the school	100(92.60%)	08 (7.41%)

Result in table 3 revealed that schools are faced with the challenges of non-availability of ICT resources (66.67%). Other challenges observed revolved around this, like non availability of fund to purchase and maintain ICT resources (86.11%), non-availability of power supply (74.07%) and inadequate availability of ICT resource (69.44%). The respondents submitted the large population of students does not pose problem and that they can use the ICT resources if made available.

Discussion

On the first research question which states that are ICT resources/facilities available for teaching the science subjects in Osun state public secondary schools? From the result, it could be seen that ICT facilities are grossly inadequate in schools in Osun state. The result corroborates the report by Aladejana (2007) who says there have been very little efforts in the integration of ICT into Nigerian

secondary school classroom. Also Olaobaju (2017) who also claimed that there were non-availability of ICT facilities for Chemistry Teaching in Osun State public high schools.

On research question two, what is the extent of teachers' utilization of ICT/E-learning resources in the science classroom in Osun state? The findings of this study revealed that ICT facilities are not made available for teaching the science subjects in the public schools. This is in line with the study of Okwudishu (2005) that ICT facilities are not made available for teaching in rural schools in Aniocha South Local Government area of Delta State. Similar result was reported by Njelita and Emendu (2015). They submitted that there were no ICT facilities in schools, that some of the desktops available were not functional, some were not installed but packed somewhere for security reasons.

With respect to research question three, the findings of this study revealed that ICT resources are not made available for teaching science in the public schools in Osun state. The science teachers are faced with various challenges which deprive the knowledgeable science teachers the use of ICT resources in public high schools. This includes lack of fund to purchase ICT facilities, unavailable ICT resources, lack of seminars/workshop and non-availability of power supply in most public schools in the state. This result is in line with the findings of Morrissa (2011) in his study on the use of ICT facilities in teaching, and found out that teachers have difficulties in the use of ICT facilities in teaching and this is associated with non-availability of ICT facilities in the school and weakness of teachers' knowledge about what technologies are available and how they can be used in Nigerian secondary schools. This study is also in line with study of Njelita & Emendu (2015), they submitted that ICT materials were not adequately supplied in schools and some of the desktops supplied were not functional while some were yet to be installed but packed somewhere for security reasons. Also, the findings of Olaobaju (2017), indicated that though teachers are knowledgeable in the use of ICT facilities, but the facilities are not available for teaching Chemistry in the High schools in Osun State. Also, Ochuku et.al. (2013) identified some constraints to effective utilization of ICT especially the e-learning technologies to include poor perception and conservative attitude of lecturers on the use of e-learning technologies for instructional delivery, shortage of qualified staff with capacity in e-learning applications, lack of training and retraining of staff and students in e-learning technologies and applications and inadequate time allocated to e-learning instruction and applications

Conclusion

The study concludes that despite the fact that science teachers have a good knowledge of ICT/e-learning resources, the resources are really not available in the public secondary schools in Osun State. Other challenges observed are non-availability of fund to purchase and maintain ICT resources, non-availability of power supply and inadequate supply of ICT resources to schools. These challenges have made it impossible for the

science teachers to use ICT resources in the science classrooms.

Recommendations

Based on the result obtained from this study, the following recommendations were made:

The Government in the State should endeavour to provide ICT resources for science teaching in public secondary schools.

Government should organise regular workshops, seminars and in-service training for science teachers, head teachers/principals to enable them see the importance and how ICT resources can be used for teaching and learning.

Ministry of Education should embrace ICT integration for the development of ICT friendly curriculum in the sciences. This will provide the pathway for easy application of ICT in teaching and learning.

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