

Assessment of Availability and Utilization of Information Technology in The Teaching of Biology in Ekiti State Secondary Schools, Nigeria

Okunade, Adesina Isaac (Ph.D)

Department of Science Education, Faculty of Education,
Federal University of Oye, Oye – Ekiti, Ekiti State

Daramola, Mercy Adesola (Ph.D)

Department of Science Education, School of Science Education
Bamidele Olumilua University of Education, Science and Technology,
Ikere - Ekiti, Ekiti State

Jegede, Rufus Oluwafemi

Department of Science Education, School of Science Education
Bamidele Olumilua University of Education, Science and Technology,
Ikere - Ekiti, Ekiti State

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ABSTRACT: *The study investigated availability and utilization of information technology in the teaching of Biology in Ekiti State secondary schools. The descriptive research design of the survey type was adopted in the study. The population of this study consisted of all the secondary schools in Ekiti State. The sample for this study consisted of 100 Biology teachers which were selected from 50 secondary schools in Ekiti State. The sample was selected using simple random and stratified random sampling techniques. Information and Technology Equipment Checklist was used for data collection. The face and content validity of each instrument was done by experts in Test and Measurement. The data collected for this study were analyzed using descriptive statistics. The findings of the study revealed that the level of availability, level of adequacy and extent of utilization of information technology facilities in teaching Biology in Ekiti State secondary schools were low. It was recommended among others that the government should provide information technology facilities in secondary schools and inspectorate department should ensure that schools with information technology facilities should put it into use in teaching and learning of school subjects especially Biology.*

KEYWORDS: assessment, availability, utilization, information technology, teaching, biology

INTRODUCTION

Science can also be described as the study of the nature and behavior of natural things and knowledge that we obtain about them (Adeuya, 2020). The major goal of science education is to develop scientifically, literate individuals that are concerned with high competence for

rational thoughts and actions. Education particularly in science and technology remains a veritable tool for individual and national development. Science education of today is expected to produce a scientifically literate citizenry that can operate in a scientific and technology changing society (Ariyo, 2017). Biology is a branch of natural science that deals with the study of living organisms, including their structures, functions, evolution, distribution and interrelationships (Adeuya, 2020). Biology is a branch of natural science that deals with the study of living organisms, including their structures, functioning, evolution, distribution and interrelationships (Olayinka, 2016).

Biology is also an important science subject option for many students to satisfy registration requirement at the Secondary School Certificate Examination (SSCE). The objectives of the Biology curriculum have been adjudged as laudable and there is evidence to show that even though many students find biology interesting, thereby registering for it in the senior secondary schools, many of them obtain poor results in the subject year in, year out (Okebukola & Akinbola, 2008, Adewale, et al., 2016).

The teaching of Biology just like any other science subject demands active students' participation involving the use of information technology. However, it seems that information technology facilities are inadequately provided in secondary schools in Nigeria as noted by (Adeuya, 2020). The importance of information technology to the successful implementation of Biology curriculum cannot be overemphasized. This is because the use of information technology is a sine qua non for effective behaviour change in learners (Okafor & Fagbemi, 2016). It appears that when the students are given the chance to learn through more senses than one, they can learn faster and easier.

In the teaching of Biology, the information technology facilities which students are exposed to remain crucial to the achievement made by them. Information and Technology, according to Kulik (2014) is a broad based technology that supports the creation, storage and manipulation of information. Smeets (2014) defines ICT as a new way of storing, processing and transmitting information brought about by rapid development in electronics, computing and telecommunication. ICT involves the methods and technical means of capturing, storing, processing, retrieving and transmitting data for the purpose of communication.

ICT gives us access to information dependent of place and time. It ensures that we can communicate about this information at any place, any time and even with everyone as desired through E-mail, discussion forums, chat boxes, web pages and videoconferencing (Umoke & Nwafor, 2014). ICT is one of the education resources which one can opt for because of the added value it creates in the teaching-learning situation.

The importance of using the internet and computers is gradually increasing in terms of the teaching of Biology. Activities carried out during the usual teaching hour are not sufficiently effective because of time constraints (Akinwamide & Olofin, 2022) hence, with information technology; students are able to carry out multimedia applications – which cannot be sufficiently taught during lessons - via the Internet. In addition, ability to see the syllabus content before coming to the class enables students to learn the concepts and thus to come to the class as prepared for the lesson. Students can discuss important subjects in the internet

environment (in forums) and establish communication both with their teachers and with other students (Olofin & Falebita, 2020).

It seems that the problems of non-availability of information technology for effective teaching of Biology in our secondary schools seems to give rise to poor academic performances as discussion and lecture methods of teaching have been dominating the teaching and learning activities where students need to do practical work. The challenge to improve the teaching of Biology in secondary schools through adequate provision of information technology facilities prompted this study.

Based on the foregoing, this study intends to investigate availability and utilization of information technology in the teaching of Biology in Ekiti State secondary schools. Specifically, the study examined

- i.the level of availability of information technology for teaching of Biology in Ekiti State secondary schools; and
- ii.the extent of utilization of information technology for teaching of Biology in Ekiti State secondary schools.

Research Questions

The following research questions were raised for this study:

- i.What is the level of availability of information technology for the teaching of Biology in Ekiti State secondary schools?
- ii.What is the extent of utilization of information and technology for teaching of Biology in Ekiti State secondary schools?

METHODOLOGY

The descriptive research design of the survey type was adopted in the study. The research was descriptive because it described the existing situation regarding availability and utilization of information technology in the teaching of Biology in secondary schools without manipulation of variables. The survey design is employed because the study covered large area from which sample was selected. The population of this study consisted of all the secondary schools in Ekiti State. The sample for this study consisted of 100 Biology teachers which were selected from 50 secondary schools in Ekiti State. The sample was selected using simple random and stratified random sampling techniques.

Information and Technology Equipment Checklist was used for data collection. Information and Technology Equipment Checklist (ITEC) consisted of section A and B. Section A sought for bio-data of the respondents which include the name of school, location of school, sex, qualification, Area of Specialization, year of experience, while section B contained 25 items where their availability and utilization was put into consideration. The face and content validity of each instrument was done by experts in Test and Measurement to determine the level of appropriateness of the instrument in measuring what they purport to measure and ensure that the instruments contained the appropriate items that could actually produce the intended responses.

The researchers personally administered the instrument with the support of the Biology teacher in each of the sampled schools. The data collected for this study were analyzed using descriptive statistics.

RESULTS

Research Question 1: What is the level of availability of information technology for the teaching of Biology in Ekiti State secondary schools?

Table 1: Frequency and Percentage analysis of availability of information technology for teaching of Biology (No of Schools – 50)

S/N	Information Technology	Adequate		Inadequate		Not Available	
		F	%	F	%	F	%
1.	Computer laboratory	0	0.0	8	16.00	42	84.0
2.	Local Area Network	0	0.0	0	0.00	50	100.0
3.	Video tape	0	0.0	0	0.0	50	100.0
4.	Interactive white board	0	0.0	0	0.0	50	100.0
5.	LCD projector	43	86.0	7	14.0	0	0.0
6.	Computers	10	20.0	10	20.0	30	60.0
7.	Printers	41	82.0	9	18.0	0	0.0
8.	Television	9	18.0	8	16.0	43	86.0
9.	Internet	0	0.0	11	22.0	39	78.0
10.	CDROM	0	0.0	10	0.0	40	80.0
11.	Instructional Software	0	0.0	1	0.0	4	80.0
12.	Smart/White Board	18	36.0	10	20.0	22	44.0
13.	Photocopy Machines	41	82.0	9	18.0	0	0.0
14.	i-pad	10	20.0	12	24.0	28	56.0
15.	School dedicated website	0	0.0	0	0.00	50	100.0
16.	Projected video package	0	0.0	0	0.00	50	100.0
17.	Laptops	24	48.0	26	52.0	0	0.0
18.	External storage facilities	0	0.0	14	28.0	36	72.0
19.	Electronic messaging	0	0.0	0	0.0	50	100.0
20.	Handsets	0	0.0	0	0.0	50	100.0

Table 1 revealed the level availability of information technology for the teaching of Biology in secondary schools in Ekiti State. Schools with the recommended numbers of information technology facilities are classified as adequate while schools without the recommended numbers are classified as inadequate and schools without any are classified as not available. The table revealed that none of the sampled schools have adequate information technology facilities. The table also revealed that the highest adequately available information technology facilities are the LCD projectors, printers and photocopy machines with over 80.0% of the sampled schools having them in their schools.

The table showed that none of the schools have all the recommended information technology as they all fall below the recommendation standard by Federal Ministry of Education (2014).

Research Question 2: What is the extent of utilization of information and technology for teaching of Biology in Ekiti State secondary schools?

Table 2: Frequency and Percentage analysis of utilization of instructional materials (N=100)

S/N	Information Technology	Frequently used (FU)		Hardly used (HU)		Not used (NU)	
		F	%	F	%	F	%
1.	Computer laboratory	6	6.0	11	11.0	83	83.0
2.	Local Area Network	0	0.0	5	5.0	95	95.0
3.	Video tape	0	0.0	0	0.0	100	100.0
4.	Interactive white board	0	0.0	0	0.0	100	100.0
5.	LCD projector	11	11.0	8	8.0	81	81.0
6.	Computers	12	12.0	11	11.0	77	77.0
7.	Printers	23	23.0	9	9.0	68	68.0
8.	Television	0	0.0	0	0.0	100	100.0
9.	Internet	3	3.0	9	9.0	88	88.0
10.	CDROM	0	0.0	0	0.0	100	100.0
11.	Instructional Software	0	0.0	0	0.0	100	100.0
12.	Smart/White Board	61	61.0	8	8.0	31	31.0
13.	Photocopy Machines	68	68.0	10	10.0	22	22.0
14.	i-pad	0	0.0	0	0.0	100	100.0
15.	School dedicated website	0	0.0	0	0.0	100	100.0
16.	Projected video package	0	0.0	0	0.0	100	100.0
17.	Laptops	32	32.0	18	18.0	50	50.0
18.	External storage facilities	0	0.0	0	0.0	100	100.0
19.	Electronic messaging	0	0.0	0	0.0	100	100.0
20.	Handsets	9	9.0	4	4.0	87	87.0

Table 2 revealed the extent of utilization of information technology facilities for teaching of Biology in Ekiti State. The table revealed that white board and photocopy machine are the information technology facilities fully utilized by over 50% of the sampled schools as other facilities are not fully utilized by majority of the sampled schools. The table also revealed that the highest fully utilized facility by the sampled schools is photocopy machines with 68.0% of the sampled schools fully utilized it.

The table above revealed that most of the teachers did not utilize the information technology facilities as recommended by Federal Ministry of Education (2014) for the teaching of Biology.

DISCUSSION

This study also showed that that none of the schools have all the recommended information technology facilities as they all fall below the recommendation standard by Federal Ministry of Education (2014). It was revealed that the highest adequately available information technology facilities are the LCD projectors, printers and photocopy machines. This implies

that information technology facilities were not adequate for the teaching of Biology. Information technology facilities were not adequate in most of our secondary schools, thereby affecting the performance of secondary school students. Most Biology teachers have been teaching Biology without the necessary information technology facilities. This present finding is in consonance with the findings of Umoke and Nwafor (2014) and Young (2014) who concluded that there is lack of adequate and appropriate information technology facilities for effective teaching of Biology in schools.

The study also revealed that most of the teachers did not utilize the available information technology facilities for teaching of Biology. This implies that the available information technology facilities are lowly utilized by Biology teachers. This finding agreed with the conclusion of Okebukola (2004) who concluded that the poor state of facilities and inadequate use of facilities has affected the teaching of Biology.

CONCLUSION

Sequel to the findings of this study, it was concluded that the level of availability, level of adequacy and extent of utilization of information technology facilities in teaching Biology in Ekiti State secondary schools are low.

Recommendations

Based on the findings of this study, the following recommendations were made.

1. The government should provide information technology facilities in secondary schools.
2. The government through inspectorate department should ensure that schools with information technology facilities should put it into use in teaching and learning of school subjects especially Biology.
3. Biology teachers should adequately put into use information technology facilities in teaching Biology in the classroom

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