TEACHER'S AWARENESS ON THE UTILIZATION OF ICT FACILITIES FOR BIOLOGY TEACHING IN SECONDARY SCHOOLS IN MATAZU LOCAL GOVERNMENT AREA, KATSINA STATE

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Abstract: *This study was carried out to investigate teachers' awareness on the utilization of ICT for Biology teaching in secondary schools in Matazu Local Government Area, Katsina State. The population of the study comprises of Biology teachers, principals of five (5) senior secondary schools in Matazu Local Government Area. Since the population is not large and it is manageable, the researchers used all the eighteen (18) biology teachers and give (5) administrators. The instruments used for data collection was questionnaire. The data collected was analyzed using simple percentages and t-test for hypotheses testing at 0.05 level of significance. The findings of the research revealed that; Biology teachers are aware of the values of using ICT facilities in teaching and learning process. About 64.7% of biology teachers do not use ICT facilities for the teaching of the subject. Only two (2) schools are equipped with ICT facilities and the available facilities include computer set, C.D player, television. The study also revealed that time allocation in the time table, lack of adequate ICT facilities and power failure are amongst the factors that hinder the full integration of ICT in teaching and learning biology in secondary schools in Matazu Local Government Area, Katsina State.*

Key Words: *Teacher: Awareness: Utilization: ICT Facilities: Teaching Biology: Secondary School: Matazu: Local Government: Katsina state: Nigeria*

1. INTRODUCTION

Information technology has been around for a long time. Basically, as long as people have been around (Will & Jeffrey, 2011). Information technology has been around because there were always ways of communicating through technology available at that point. There are four ages that divide up the history of information technology namely; Premechanical age (between 3000BC and 1450 A.D), Mechanical age (between 1450 and 1840 A.D.), electrochemical age (between 1840 A.D. and 1940) and the electronic age (between 1940 and right now). Only the latest age (electronic) and some of the electrochemical age really affects us today (Will & Jeffrey, 2011).

The Federal government in its release on educational objectives for secondary education as endorsed in the Federal Republic of Nigeria (1998), stated the need to equip students to live effectively in this modern age of science and technology. In order to attain its objectives, science education has met with a revolutionary trend in the past few decades (Onasanya, 2011). The major goal of science education is to develop scientifically literate individuals that are concerned with high competence for rational thoughts and actions. The objectives of science education in this country according to Onwu (1993), include the need to prepare students to:

- Observe and explore environment;
- Explain natural phenomena;
- Develop scientific attitudes including curiosity, critical reflection and objectivity;
- Apply the skills and knowledge gained through science to solve everyday problems in the environment;
- Develop self-confidence and self-reliance through problem solving activities in science.

In a bid to attain these objectives, several strategies and resources have evolved. The resources range from human to materials including the audio-visual/media during the lesson (Onasanya, 2011). Towards the end of the 20th century and at the wake of the 21st century, it became apparent that national development depends on educational advancement which in turn depends on technological progress (Adeyanju, 1998; Akindolu, 2002). Development of ICT has broken all national and international barriers and turned the world into a global village, making information available for everyday, anywhere, and at anytime. Since ICT improves the quality of education of a nation, then national development depends on the extent to which a nation used ICT facilities in education (Onasanya, 2011).
Information Communication Technology (ICT) is a term that covers all forms of computer and communication equipments and software used to create, store, transmit, interpret and manipulate information in its various formats (UQ, 2002). These electronic systems can be used for broadcasting, telecommunications and all forms of computer-mediated communications. ICT centred education covers the use of computers, on-line self-learning, interactive CDs, satellites, radio, optical fibre technologies, tale presence systems and all types of information technology (IT)

hardware and software (Akindolu, 2002; Adebayo, 2002). It is also defined by Olugbenga and Adebayo (2010) as collection, retrieval, use and storage and communicating information through the use of computers and micro-electronic systems.

ICT is widely used in the entire globe for different purposes, including business, health, transport, communication and education. The advancement of ICT ranging from electronic chips, mini computers, to large scale devices has its impact on every sector, and has crossed every nation in the world. But the way they utilize it differs from country to country. Computer and internet have integrated a lot of information and communication technology, leading to e-commerce, e-banking, e-government, e-learning, e-library and more (Kazi *et al.*, 2012).

Education system tries to inculcate the ICT in its efficient ways to enable teachers and students to access and gain knowledge. Teaching and learning cannot happen like the analogy of a spoon feeding knowledge at a given time. Therefore, ICT has enormous role in making teachers and students to reach the knowledge. Apart from the pedagogy, ICT penetrated into the educational management in the system. The hierarchy in the educational management from federal educational management to the school management requires the latest technological advancements in planning, organizing, leading and controlling educational organizations. The evaluation of input and output of the school is necessary for the future vision of the school. In the school, teachers are the frontiers who need up to date information and skills for better education of the coming generation. Hence, teachers need professional development in pedagogical knowledge and technology. With respect to all these mentioned, ICT is the key element in educational effectiveness in schools (Kazi, *et al*, 2012).

The use of ICT afford students the opportunity to progress according to their own face; they are free to choose the content, free to use the appropriate media, and are able to study anywhere, anytime (Coller, 2012). ICT have the potential to accelerate, enrich, and deepen skills, to motivate, and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers as well as strengthening teaching and helping schools change (Davis and Tearle, 1999 cited by Yusuf, 2005).

The introduction of ICt in Biology lesson can raise not only level of knowledge but students attitudes towards biology as well. As biology teachers, we need to distinguish between two groups of applications. In the first group are generic applications used in all subjects like; word-processing, searching for information, communication using e-mails and multimedia presentations. In this case if a biology teacher does not use ICT in a classroom, damage to the students is limited because they can achieve missing skills with their work in other subjects or at home. In the second group are applications adapted or developed to be used in science teaching, like; imaging systems in microscopy, virtual laboratory and real laboratory exercise with data acquisition systems. The most important difference among these two groups of application is that if a science teacher does not use such application in teaching students in most cases they would not be able to compensate loss with their work in other subjects at home (Sorgo *et al*, 2009).

There are many factors that hinders the full utilization of ICT facilities in educational institutions, for example, a study was conducted by Barry and Colleagues in (2007) shows that there is underutilization of ICT resources in Eastern Europe, Africa and some parts of North America. This underutilization is born out of a number of barriers; lack of ICT support personnel, intermittent internet condition, absence of ICT-related projects, lack of teachers training programmes in ICT use and the nature of the curriculum were cited as some of the overarching impediments to ICT use. The absence of ICT equipment in most Nigerian Secondary Schools leads students to resort to cyber cafés for internet access. Most cyber cafes clients in Nigeria are students (Adomi, Okiyi and Ruteyan, 2003; Adomi forthcoming).

There is need to stand up to the challenges and systems of learning ICT skills among secondary schools students as already Nigeria is growing backward in the embarrassment and training/teaching of ICT skills for pupils and students of primary and secondary schools. The use of ICT facilities in classroom learning situation at colleges and universities level entails that students should be conversant with ICT skills at secondary school level before going to higher level, most especially that today lecturers use technologies in delivering content of their lectures without being physically present in the class. The Economic Commission for Africa has indicated that the ability to access and use information is no longer a luxury, but a necessity for development. Unfortunately, many developing countries especially in Africa, are still low in ICT application and use (Aduwa-Ogiebean and Iyamu cited in Onasanya *et al.* (2011). To ascertain full awareness and utilization of ICT in science and Biology teaching and learning in schools in Matazu Local Government Area must involve attitude of managers in education sector, teachers and students' willingness in acquiring ICT skills.

2. STATEMENT OF THE PROBLEM:

The usage of ICT in schools is so diverse that it is almost impossible to list all possible applications. The introduction of ICT in biology lesson can raise not only level of knowledge but students attitude towards biology as well.

Okebukola cited by Aduwa and Iyamu (2003) concludes that the computer is not part of classroom technology in more than 90 percent of Nigerian public schools. This implies that the chalk board and textbooks continue to

dominate classroom activities in most Nigerian secondary schools. Could it be as a result of lack of awareness of the ICT facilities, could it be as a result of lack of interest in using the resources or lack of information literacy? This study therefore investigates biology teachers' awareness and extent of utilization of ICT facilities for Biology teaching in secondary schools in Matazu Local Government Area of Katsina State.

3. RESEARCH QUESTIONS:

The following research questions form the basis for the study.

- Do teachers of biology in secondary schools of Matazu use ICT in teaching biology?
- What types of ICT facilities to teachers in secondary schools in Matazu Local Government Area use for teaching?
- Are biology teachers in secondary schools of Matazu aware of the values of using ICT facilities in teaching and learning process?
- How many secondary schools in Matazu are equipped with ICT facilities and access to the teachers for teaching biology?
- What are the factors that hinders the use of ICT in teaching and learning biology in secondary schools in Matazu?

4. RESEARCH HYPOTHESES:

- There is no significant difference between teachers' awareness and level of ICT utilization in teaching biology.
- There is no significant difference in the teachers awareness of the value of use of ICT between schools with ICT facilities and those that are lacking ICT facilities.

5. METHODOLOGY:

The survey method was adopted for this study. The population of this study comprised all the secondary schools teachers in Matazu Local Government Area, Katsina State. (1,740) students, eighteen (18) biology teachers, and each school have one principal which gives a total of five (5) administrators/principals to be used in the study. The entire population was used for this study and questionnaire was the instrument for data collection and simple frequency distribution tables, percentages and t-test were used for data analysis and interpretation

6. RESULT AND DISCUSSION:

Research Question Two (1)

Do teachers of biology in secondary schools of Matazu Local Government Area use Information and Communication Technologies (ICT) in teaching biology?

In order to answer research question one, the teachers response to question 10, the teachers questionnaire was used. The summary of the teachers' responses to the question is shown in Table

Summary of Teachers' Use of ICT for Teaching Biology for teaching biology

Items	Frequency (No.)	Percentage (%)
Very Often	5	29.4
Often	1	5.9
Not Often	11	64.7
Total	**17**	**100.0**

Source: Field Survey, 2016

From Table shows that about 64.7% of the respondents do not often use Information and Communication Technologies (ICT) facilities, 29.4% of the respondents use if very often while only 5.9% of the respondents used it often. This indicates that majority of biology teachers in Matazu Local Government Area do not use Information and Communication Technologies (ICT) facilities for biology teaching. To further support the teachers' response, question 6 in the principal's questionnaire was used. The summary of the principal's responses in shown in Table 4.1b.

Teachers' Use of ICT for Teaching Biology

Items	Frequency (No.)	Percentage (%)
Very Often	2	40.0
Often	0	0.0
Not Often	3	60.0
Total	**5**	**100.0**

Source: Field Survey, 2016

From Table discovered that about 60% of the respondents responded that the teachers do not use Information and Communication Technologies (ICT) facilities, 40% of the respondents aid the teachers use it very often and 0% responded often. This also indicates that majority of the teachers in secondary schools of Matazu Local Government Area do not use Information and Communication Technologies (ICT) for teaching Biology.

Research Question Two (2)

What type of Information and Communication Technologies (ICT) facilities do teachers in secondary schools of Matazu Local Government Area use for teaching biology?

In order to answer research question 2, question 11 on the teachers' questionnaire was used. The summary of the teachers responses is shown in Table

Table: Types of ICT Facilities used for Biology Teaching

Items	Use		Not Use	
	F	%	F	%
Computer	7	41.2	10	58.8
Projector	0	0.0	17	100.0
Radio	0	0.0	17	100.0
Television	7	41.2	10	58.8
CD Player	7	41.2	10	58.8

Source: Field Survey, 2016

Table shows that computer, television and CD player have 41.2% used and 58.8% not used while projector and radio scores is 0% use and 100% not use. This indicates that computer, television, CD player, projector and radio are the types of Information and Communication Technologies (ICT) facilities available in secondary schools of Matazu Local Government Area for teaching biology. However, it shows that the level of utilization is very low.

Research question Three (3)

Are biology teachers in secondary schools of Matazu Local Government Area aware of the values of using Information and Communication Technologies (ICT) facilities in teaching and learning process?

In order to answer research question three (3), question 14 of the teachers' questionnaire was used. The summary of the teachers response is shown in Table

Table Teachers' Awareness of the Use of ICT Facilities for Teaching Biology

Items	Frequency (No.)	Percentage (%)
Highly Helpful	16	94.1
Partially Helpful	1	5.9
Not Helpful	0	0.0
Total	**17**	**100.0**

Source: Field Survey, 2016

Table shows that 94.1% of the teachers responded highly helpful, 5.9% responded partially helpful whereas 0.0% responded not helpful. This indicated that biology teachers in secondary schools of Matazu Local Government Area are aware of the values of Information and Communication Technologies (ICT) facilities. To further support the teachers' response, question 12 on the teachers' questionnaire was used. The summary of the responses is shown in Table

Table: Teachers' Awareness on the Use of ICT Facilities to Control Large Class Size

Items	Frequency (No.)	Percentage (%)
Very Helpful	16	94.1
Partially Helpful	1	5.9
Not Helpful	0	0.0
Total	**17**	**100.0**

Source: Field Survey, 2016

Table revealed that 94.1% of the teachers responded very helpful, 5.9% responded partially helpful while 0% responded not helpful. This indicated that biology teachers in secondary schools of Matazu Local Government Area are awareness of the values of Information and Communication Technologies (ICT) facilities in controlling large class size.

Research Question Four (4)

How many secondary schools in Matazu Local Government Area are equipped with Information and Communication Technologies (ICT) facilities and access to teachers for teaching biology?

In order to answer research question four (4), the teachers responses to question eight (8) of the teachers' questionnaire is shown in Table

Table: Availability of ICT Facilities for Teaching Biology

Items	Frequency (No.)	Percentage (%)
Very Sufficient	7	41.2
Fairly Sufficient	0	0.0
Not Sufficient	10	58.8
Total	**17**	**100.0**

Source: Field Survey, 2016

Table shows that 41.2% of the teachers responded very sufficient, 0.0% responded fairly sufficient whereas 58.8% responded not sufficient. This indicated that only two (2) schools (41.2%) in Matazu Local Government Area are equipped with Information and Communication Technologies (ICT) facilities for teaching Biology whereas three (3) schools (58.8%) are not equipped with Information and Communication Technologies (ICT) facilities.

7. ANALYSIS OF HYPOTHESES:

Hypothesis One (1)

There is no significant difference between teachers' awareness and level of Information and Communication Technologies (ICT) utilization in teaching biology.

In order to analyze hypothesis one, t-test was used. The summary of the data analyzed in shown in Table

Table 4.2a: t-test of Difference between Teachers' Awareness and Level of ICT Utilization

Variables	N	$\overline{X}$	SD	df	t-cal	P	t-crit
Teachers' Awareness	17	5.6	7.3	15	0.75	0.025	2.131
Level of ICT Utilization	17	5.6	7.3				

The result of the t-test show that t-calculated value (0.75) is less than t-critical value (2.131) at 15 degree of freedom and at P≥0.05 level of significance. This means that there is no significant difference between teachers' awareness and level of Information and Communication Technologies (ICT) utilization in teaching biology. Therefore, the null hypothesis is retained.

Hypothesis Two (2)

There is no significant difference in the teachers' awareness of the value of use of ICT between schools with ICT facilities and those that are lacking ICT facilities.

In order to analyze or test hypothesis 2, t-test was used. The summary of the analyzed data is shown in Table 4.2b.

Table 4.2b: t-test of Difference between Schools with ICT and those without ICT Facilities

Variables	N	$\overline{X}$	SD	df	t-cal	P	t-crit
Schools with ICT	7	2.3	2.5	15	0.92	0.025	2.131
Schools without ICT	10	3.3	0.4				

The result of the t-test show that t-calculated value (0.92) is less than t-critical value (2.131) at 15 degree of freedom and at P≥0.05 level of significance. This means that there is no significant difference in the teachers' awareness of the value of use of Information and Communication Technologies (ICT) between schools with Information and Communication Technologies (ICT) and those that are without Information and Communication Technologies (ICT) facilities. Therefore, the null hypothesis is retained.

8. SUMMARY OF THE FINDINGS:

From the analyzed data, the results revealed that:

- Biology teachers are aware of the values of using Information and Communication Technologies (ICT) facilities for the teaching and learning process.
- About 64.7% of biology teachers do not use Information and Communication Technologies (ICT) facilities for the teaching of the subject.
- Only two (2) schools are equipped with Information and Communication Technologies (ICT) facilities and the facilities are in good working condition.

- Computer, television and CD player are the available Information and Communication Technologies (ICT) facilities in the schools for the teaching and learning of biology.
- Time allocation in the timetable, lack or inadequate facilities and power failure are among the problems that hinders the use of Information and Communication Technologies (ICT) in teaching and learning biology in secondary schools in Matazu Local Government Area, Katsina state.

9. RECOMMENDATIONS:

Based on the findings of the study, the researchers forwarded the following recommendations:

- The required ICT facilities and infrastructure should be provided in schools by government, companies, religious groups, NGOs, social organizations, PTAs etc.
- The government should ensure regular supply of electricity in schools.
- Proper timing should be done in order to allow teachers to have maximum time for ICT integration in biology classes.
- Science teachers should be trained on the use of ICT resources for science teaching and learning particularly, the use of different software packages, CD ROMs, Video tapes on science concepts and processes etc.
- Government should make it mandatory for science teaches to always; attend seminars, workshops, conferences and fresher course in computer.

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