Availability of Resources for Effective Teaching and Learning of Biology in Public Secondary Schools in Abeokuta South Local Government Area of Ogun State

BELLO ABOSEDE O.[1], AROWOLO MOJISOLA T.[2], OLANIYI, OLAGOKE A[3]
[1, 2, 3]*Biology Department, Federal College of Education, Abeokuta.*

Abstract- ***The study was conducted to assess the resources available for effective teaching and learning of Biology in Senior Secondary schools in Abeokuta South Local Government area of Ogun State. It attempted determining the number of qualified and experienced science teachers available in schools, and extent of use of instructional material in schools within the study area. Nine research questions and three hypotheses were formulated to guide the study. Purposive sampling technique was used to select 200 students and 20 teachers from 10 schools out of 18 public secondary schools in Abeokuta South Local Government area of Ogun State for appropriate sampling. Datawere obtained through the use well-structured questionnaire. This study adopted descriptive statistics, while correlation coefficient was used to test the hypotheses through the use of Statistical tool for social sciences (SPSS)23. Findings revealed that there is significant relationship between teacher's availability and teaching or learning of biology in secondary schools (R2 =0.785** p<0.005). The result revealed that there is positive and significant relationship between effectively utilized laboratory methods/resources in teaching or learning of biology in secondary schools (R2 =0.847** p<0.005). The findings showed that there were qualified and experienced teachers, but schools lacked adequate instructional resources for effective teaching and learning process; it is therefore recommended that there is need for the government, parents, teachers and other stakeholders to join hands in procuring necessary resources in schools. Also, trainings should be regularly organized for teachers to keep them abreast of modern trends in Biology .***

Indexed Terms- ***Teacher's availability, Biology, Instructional materials, Laboratory methods.***

I. INTRODUCTION

Education is a purposeful activity directed at achieving certain aims, such as transmitting knowledge or fostering skills and character traits (Chazan and Barry, 2022). According to Aniodoh (2014), Science is a body of knowledge arrived at through systematic and procedural processes based on tentative observation and experiment. Biology as one of the science subject is defined as the study of life and structure of living things and concerns itself with the study of structure, behavior, distribution, the origin of plants and animals and their relationship with the environment (Ajayi, 2015).

The West African Examination Council (WAEC) and National Examination Council (NECO) among others syllabus on biology is structured using the conceptual apparatus. It is expected that with adequate exposure to the syllabus, the students will not only acquire scientific skill and attitudes, but will also demonstrate a thorough understanding of scientific concepts while providing practical solutions to real life problem (Bandele, 2015).There are varieties of materials which the Biology teachers use; these resources are models, charts, preserved specimens of plants and animals, culturing equipment and microscope. The resources should be provided in quality and quantity in classroom for effective teaching-learning process (Babayemi, and Raimi, 2014). Josiah and Ali (2013) in an empirical study, revealed that essential facilities such as equipment like radio, television, computers, chemicals, specimens, videos tape, stave, Bunsen burners, models and charts are not available in schools. This inadequacy of teaching materials, laboratory, space, has been of serious concern to educators.

The decline in performance in Science Technology and Mathematics (STM) may be unconnected with poor learning environment created by this state of infrastructural facilities Akinsola (2013). Mapaderun (2015) also emphasized that the availability and adequacy of these facilities promote effective teaching and learning activities in schools. Several efforts have been extended by Science Teachers Association of Nigeria (STAN) to train secondary school teachers on improvisation techniques in various science subjects including Biology; hence there is need to assess how far teachers have been able to improvise instructional material for effective teaching.

Resources otherwise called instructional materials are educational input such as object of study which facilitates teaching and learning process and bring about success in the classroom (Usman, 2014). Learning becomes real and immediate because resource material aids utilization, and emphasizes understanding. Resource material stimulates a learner to develop interest thereby achieving the desired goal. Agwu (2012) opined that resources in an educational sense are those things in the school or its environment that may be used to help teaching or learning.

The use of instructional resources in secondary schools is not encouraging. As a result, it makes the morale and interest of the students in biological science low. This is because most teachers adopt the verbalistic and theoretical method as a way of teaching and learning the subject, mainly due to non-availability of instructional resources in schools. The present study attempts to assess the availability and utilization of instructional resources in teaching and learning Biology in senior secondary schools.

Objective of the Study

The aim of the study is to investigate the use of instructional resources in teaching and learning biology in secondary schools in Abeokuta South Local Government Area of Ogun State.

Research Questions

1. To what extent are Resources made available to biology teachers in secondary schools?
2. To what extent do teachers utilize the Resources in teaching and learning of biology in secondary schools?
3. To what extent are standard and well equipped laboratories available in these schools?
4. To what extent do teachers have access to the Resources in teaching of biology in secondary schools?
5. To what extent do Resources help to facilitate effective teaching and learning and understanding concepts?
8. What are the challenges hindering teachers from using Resources in teaching and learning process in secondary schools.

1.5 Research Hypotheses

Ho1: There is no significant relationship between the teacher availability and teaching or learning of Biology in secondary School

Ho2: There is no significant relationship between instructional resources and teaching or learning of Biology in secondary schools

Ho3: There is no significant relationship between effectively utilization of laboratory

Research design

The research population is made up of Biology teachers and students in Senior Secondary Schools in Abeokuta South Local Government of Ogun State. Using stratified random sampling procedure, a total of two hundred (200) respondents comprising of 20 teachers and 200 students served as the population of the study. A questionnaire tagged “Assessment of the Resources Available for the effective Teaching and Learning of Biology (ARAETB) comprising of two sections: A and B was designed. Section A was to elicit information on the demographic data of the respondents. Section B consisting of 16 items were designed to gather information on the factors influencing the academic performance of Biology on a four-Likert scale of responses; Strongly Agreed (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). For data analysis, descriptive and inferential statistics were adopted. The descriptive statistics relate to the responses from the sampled respondents using simple percentage method. For the inferential statistics,

Pearson correlation co-efficient was used to test the Hypotheses in order to establish a relationship between the variables.

Data Presentation and Analysis

Demographic Data of Respondents

Demographic Presentation of Respondents

Table 11. Gender of Students

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	79	39.5	39.5	39.5
Female	121	60.5	60.5	100.0
Total	200	100.0	100.0	

From the result in table 1.1, it was revealed that 39.5% representing a total of 79 students are male while 60.5% of the respondents representing a total of 121 are female. However, both genders' opinion was taken into consideration.

Table 1.2. Gender of Teachers

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	4	20.0	20.0	20.0
Female	16	80.0	80.0	100.0
Total	20	100.0	100.0	

From the result in table 1.2, it was revealed that 20% representing a total of 4 teachers were male while 80% of the respondents representing a total of 16 are female. However, the opinion of the both genders were taken into consideration.

Table 2: Highest Qualification of Teachers

Highest Qualification	Frequency	Percent	Valid Percent	Cumulative Percent
B.Ed	3	15.0	15.0	15.0
B.Sc	1	5.0	5.0	20.0
B.Sc/PGDE	6	30.0	30.0	50.0
HND	3	15.0	15.0	65.0
HND/PGDE	2	10.0	10.0	75.0
Others	5	25.0	25.0	100.0
Total	20	100.0	100.0	

Result presented in table 2 shows that 15% (3 teachers) of the total number of respondents are B.Ed holders, 5% (representing 1 teacher) are B.Sc holder, 30% (6 teachers) have B.Sc/PGDE qualification, 15% (3 staff) are HND holders, 10% (2 staffs) have HND/PGDE qualification while 25% (5 staff) have other qualifications. This implies that the questionnaire was distributed to cut across at various qualifications.

Table 3: Teaching Experience

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Below 2 years	1	5.0	5.0	5.0
2-5 years	3	15.0	15.0	20.0
6-9 years	4	20.0	20.0	40.0
Above 10 years	12	60.0	60.0	100.0
Total	20	100.0	100.0	100.0

From the result above (table 3), it was observed that only one out of the 20 teachers have below 2 years of working experience. 3 teachers (15%) have between 2-5 years working experience, 4 respondents (20%) have 6-9 years teaching experience while the largest number of group (12) have above 10 years teaching experience.

Table 4. Perceptions of the students to Learning Resources

S/N	Descriptive Statistics	N	Mean	Std. Deviation
Q1	There are adequate learning resources in my school	200	2.37	1.094

Q2	Most of Biology Lessons are theoretical	200	2.25	0.941
Q3	Teacher employ alternative to practical due to lack of learning resources	200	2.35	1.003
Q4	Students participate in practical when learning resources are provided	200	1.83	1.020
Q5	Practical activities improve learning in Biology	200	1.52	0.770
Q6	Insufficient materials help students to learn improvisation	200	2.20	1.030
Q7	Our teacher usually improvise material for ICT related experiments	200	2.06	1.047
AVERAGE			2.08	
Valid N (list wise)		200		

From the result in the that majority of the respondents disagreed with the response rate of Q1, Q2, Q3, Q4, Q6, Q7 being higher than 2. To further explain, students confirmed that there are no adequate learning resources in their schools which may aid their level of understanding in biology.

Table 5: Perception of teachers on the use of instructional resources for teaching Biology in the Secondary schools available

S/N	Availability of Learning Material In Schools			
		N	Mean	Std. Deviation
Q1	There are available materials for the teaching of Biology in Public School	20	2.20	1.005
Q2	Teachers teach biology effectively without the use of instructional resources or materials	20	3.30	.801
Q3	Teacher can easily improvise instructional materials for Biology Lesson	20	1.80	.616
AVERAGE			2.38	
Valid N (listwise)		20		

From the responses of teachers in table above, it was observed that there are inadequate materials available for the teaching of biology in schools (2.20) and without these materials, they are unable to teach biology effectively as confirmed in Q2 of this table. Also, with the response rate in Q3, teachers easily improvise instructional material for biology lesson. However, respondents do not agree to Q4 implying that majority of the teachers are not satisfied with the level of instructional material in their school.

Table 6: Teachers' response on the utilization of laboratory method in teaching Biology Practical

S/N	Descriptive Statistics			
		N	Mean	Std. Deviation
Q1	I prepare required	20	1.80	.523

	laboratory specimens before the practical			
Q2	The practical related topics to topics are always carried out	20	2.05	.605
Q3	Biology Laboratory equipment and materials for practical are made accessible to the biology teacher by the Head teachers	20	2.05	.826
Q4	Improvisations of the non-available resources materials or specimens for practical are done with assistance of students	20	2.25	.786
Q5	Alternative to the practical are done when the required resources are not available	20	1.50	.607
Q6	Attitudes of biology teachers affects the students in the learning process	20	1.85	.933
AVERAGE				
Valid N (listwise)		20		

In relation to the utilization of laboratory method in teaching biology, teacher confirmed that they prepare the required laboratory specimen before the practical (1.8). The statement in Q2 confirmed that practical-related topics are hardly carried out because required materials are not made accessible for teachers to use (Q3). Teachers also disagree that the Improvisations of the non-available resources materials or specimens for practical are done with assistance of students. Where there no practical instruments, teachers other methods are used as shown in Q3. Also, unavailability of materials, affects students learning process as revealed in Q6.

Table 7: Teachers availability for teaching and learning of biology in the secondary schools

S/N	Descriptive Statistics			
		N	Mean	Std. Deviation
Q1	Teachers prefer doing Biology related job in industry than teaching in secondary school	20	2.70	.979
Q2	Teacher always check the students previous assignment before giving new ones	20	1.40	.503
Q3	There is inadequate number of biology teachers in public secondary schools	20	2.15	.875
Q4	Teacher-student ratio in public secondary schools affect the learning of Biology	20	1.95	.759
Q5	Teacher takes time to ensure student participation in learning Biology,	20	1.35	.489

	especially the practical aspect			
Q6	Incorporation of ICT and training of teachers helps improving teaching and learning of Biology	20	1.40	.598
Q7	Teachers make use of charts and pictures during Biology lessons	20	1.60	.503
	AVERAGE		1.79	
	Valid N (listwise)		20	

In response to the result of teacher's availability, majority of teachers prefer working in secondary school than any other biology related job in industry. Teachers also confirmed that it is their duty to check previous assessments before giving out new ones. Also, in Q3 having a mean response rate of 2.15 confirmed that there are adequate number of biology teachers in public schools. Teachers also confirmed that teacher-student ratio in public school affect learning of biology due to the outrageous number of student's in the class of public schools. In relation to Q5, teachers also took their time to ensure that students participates in the learning of biology most especially practical. Teachers confirmed that the provision of ICT in schools will improve their teaching and learning of biology. Overall, majority of the questions posed were agreed to by the teachers confirming teachers' availability to teaching biology.

Test of Hypothesis One

Ho1: There is no significant relationship between teacher's availability and teaching or learning of biology in secondary schools

Table 8: Teachers View Correlations

	Teaching of Biology	Teacher's Availability
Teaching of Biology	Pearson Correlation	1
Sig. (2-tailed)	.000	
N	20	
Teacher's Availability	Pearson Correlation	.785**
Sig. (2-tailed)	.000	
N	20	

**. Correlation is significant at 0.01 level (2-tailed).

From The result above, there exists a Pearson correlation coefficient of 0.785** indicating the existence of strong positive relationship between teachers availability and the teaching of biology in secondary school. However, the result also show a sig.(2-tailed) of 0.000 which is less than the pre-test value of 0.05 (5%) confirms that null hypothesis is rejected. With this, we conclude that there is significant relationship between teacher's availability and teaching of biology in secondary schools.

Both the result from the students view and the teachers view are statistically significant indicating the rejection of the null hypothesis one. Hence, it is concluded that there is no significant relationship between teacher's availability and teaching or learning of biology in secondary schools

Test of Hypothesis Two

Ho2: There is no significant relationship between Instructional resources and teaching or learning of biology in secondary schools.

Table 9: Test of hypothesis for Teachers Correlations

	Instructional Materials	Teaching of Biology
Instructional Materials	Pearson Correlation	1
Sig. (2-tailed)	.001	
N	20	
Teaching of Biology	Pearson Correlation	.009**
Sig. (2-tailed)	.001	
N	20	

**. Correlation is significant at the 0.01 level (2-tailed).

From table 9, the result show a sig. Of 0.001 which is less than the pre-test value of 0.05 (5%) confirms that

null hypothesis is rejected. With this, we conclude that there is significant relationship between instructional and teaching of biology in secondary schools. From teachers' perspective are statistically significant indicating that teachers depend more on instructional resources.

Test of Hypothesis Three

Ho3: There is no significant relationship between effectively utilized laboratory methods and teaching or learning of biology in secondary schools

Table 10: Correlations

	Teaching of Biology	Laboratory Methods
Teaching of Biology	Pearson Correlation	1
Sig. (2-tailed)	.000	
N	20	
Laboratory Methods	Pearson Correlation	.847**
Sig. (2-tailed)	.000	
N	20	

From The result in table 10 (teachers view), there exist a Pearson correlation coefficient of 0.847** indicating the existence of strong positive relationship between effectively utilized laboratory methods and the teaching of biology in secondary school. Hence, the null hypothesis was rejected. Therefore, there is significant relationship between effectively utilized laboratory methods and teaching of biology in secondary schools.

Both the result from the students view and the teachers view are statistically significant indicating the rejection of the null hypothesis one.

Test of hypothesis for Students responses

Table 11: Correlations

	Learning of Biology	Instructional Resources
Learning of Biology	Pearson Correlation	1
Sig. (2-tailed)	.992	
N	200	
Instructional Resources	Pearson Correlation	.001
Sig. (2-tailed)	.992	
N	200	

Test of hypothesis for Teachers responses

Table 12: Correlations

	Instructional Materials	Teaching of Biology
Instructional Materials	Pearson Correlation	1
Sig. (2-tailed)	.001	
N	20	
Teaching of Biology	Pearson Correlation	.009**
Sig. (2-tailed)	.001	
N	20	

**. Correlation is significant at the 0.01 level (2-tailed).

From the result of the hypotheses tests, a significance (2-tailed) of 0.992 which is greater than the pre-test value of 0.05 (5%) confirms that null hypothesis is accepted. Also, from 12 (teachers view), there exists a Pearson correlation coefficient of 0.009**, the result also show a sig.(2-tailed) of 0.001 which is less than the pre-test value of 0.05 (5%). Hence, the null hypothesis is rejected. With this, we conclude that there is significant relationship between instructional and teaching of biology in secondary schools.

II. DISCUSSION OF FINDINGS

The result in hypothesis one with a Pearson correlation coefficient of 0.289** indicates that there is positive and significant relationship between teachers availability and the learning of biology by students in secondary school. Also, a Pearson correlation coefficient of 0.785** indicate the existence of strong positive relationship between teachers availability and the teaching of biology in secondary school. This result confirms the findings of Isaac (2019), in a study conducted on teachers' factors influencing student's academic performance in public secondary schools in Rivers State. It also corroborates the findings of Okongo, et al., (2015), who carried out an analysis on availability of teaching and learning resources on the

implementation of inclusive education in Pre-School Centers in Nyamira North Sub-County, Kenya. The result in hypothesis one having a coefficient of 0.289** indicate that there is positive and significant relationship between teachers availability and the learning of biology by students in secondary school. In addition, from the teacher's perspective, there is indication of the existence of strong positive relationship between teachers availability and the teaching of biology in secondary schools.

It was also concluded that there is significant relationship between instructional and teaching of biology in secondary schools (table 12). This result is in relation to the assertion of Nzewi and Nwosu (2014); Ajayi (2002); and Bassey (2002) who found out that the proper use of instructional materials will positively enhance teaching and learning process which becomes imperative for educators (teachers) to improvise aids and materials for the teaching learning process.

CONCLUSION AND RECOMMENDATION

The use of instructional resources is essential in helping students to explore and develop ideas about their environment and be scientifically literate, in the absence of these resources or inadequate facilities and equipment, teachers should not use it as an excuse for poor teaching or skipping that topic or theme. It was recommended that teachers should learn to improvise, and learners should be involved in improvisation. Also, there is need for the government, parents, teachers, association, philanthropist and voluntary organizations to join hands in procuring necessary facilities or resources in schools. Likewise, Science teachers should be trained through in-service training workshops to learn skills of resources utilization thereby making their effort more effective.

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