



Impact of Improvised Instructional Materials in Teaching and Learning of Biology among School Students in Jema'a Local Government Area

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ABSTRACT

This research delved into the Impact of Improvised Instructional Materials in the Teaching and Learning of Biology among secondary school students in Jema'a Local Government Area of Kaduna State. The study aimed to assess the availability of instructional materials in these schools, investigate whether teachers' professional qualifications influenced academic performance in Biology, explore the extent to which teachers utilized these materials, and examine students' interest in biology lessons when instructional materials were employed. The research design involved a sample of seventeen (17) secondary schools, selected randomly through the stratified random sampling technique. The study's sample size comprised 200 senior secondary school biology students from the randomly selected schools. The study's findings revealed that biology teachers in Jema'a Local Government Area possessed the necessary educational qualifications for teaching biology. Moreover, students' academic achievement in Biology was found to be independent of teachers' skills and experience. Based on the results, it is recommended that biology teachers enhance their teaching methods, focusing on improvisation and practical classes. The presentation of biology content significantly influences student learning. Additionally, students should be educated on the relevance of biology, motivated to develop a positive attitude toward the subject. Furthermore, government support is crucial to encourage teachers to stay and grow in their profession, leveraging accumulated experience for enhanced classroom achievement and societal development.

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INTRODUCTION

Science explains the natural existence of man and his activities. Science could be seen as problem solving in order to improve the living standard of man. (Adesina, 2018), There are different definitions of science by different schools of thought; Owolabi (2020) defines science as an integrated part of human activities. It is seen as a dynamic human activity concerned with manipulating spherical world. It is seen as "knowledge covering general truths and laws, obtained and tested through scientific methods as concerned laws with the physical world". Science can be seen as the bedrock of national development. A

nation that is not scientifically advanced is termed a backward nation. Science is used by humans to solve daily problems and control the environment. The usefulness of science cannot be under-rated. There are many areas of life that science has contributed such as in medicine, geophysics, hydrology, agriculture, communication, technology, education, transportation, healthcare to mention a few. Agriculture has improved greatly through the introduction of high yield improved agricultural seeds. Science has led to breakthrough in medical care. Diagnostic machine for checking different ailments and diseases are now controlled and diseases cured through science.

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The usefulness of science to humanity cannot be over emphasized. Biology is defined as the study of living things which include plants and animals. It is a fascinating study that ranges from microscopic-cellular molecules to the biosphere, encompassing the earth's surface and its living organisms (Sarigin, 2020). Biology is a core subject that is mandatory in all secondary schools in Nigeria as it is a pre-requisite to the study of many courses relevant to humanity which include the following; Medicine, Pharmacy, 2 Biology, Agriculture, Anatomy, Physiology, Botany, Zoology, Microbiology, Cell Biology, Ecology, Entomology Immunology, Molecular biology, Evolutionary, Genetics and population dynamic among others. Biology can be conveniently taught in a laboratory which is a place designed and equipped with materials for teaching and learning. It is obvious that most secondary schools lack physical laboratories and where they exist, there are inadequate or lack of equipment. One of the problems militating against effort to enrich science is inadequate or absence of teaching aids or materials which include; indoor or outdoor laboratory, reagents, chemicals and unqualified teachers. Nwoji (2018) reported that some essential facilities were not available in the school visited (Baiké 2019). The importance of Biology is so much that it needs to be taught with instructional materials to arouse students' interest. Tabotndip (2020) lamented that abstract teaching goes on today where teachers do not use apparatus and students are not using textbooks. It is reported that most secondary schools do not have biology laboratory, the few existing ones have been converted into classrooms to create space for the overwhelming population of students arising from the Universal Basic Education (UBE) and Universal Primary Education (UPE). As a result of WAEC specification on SSCE examination, some schools resorts to multipurpose laboratory. There is need for a single laboratory for each of physics, Biology as well as biology practicals. This ought not to be so for they have their disadvantages such as fire or chemical outbreak or accidents. In case of biology, the charts, specimen and models may

not be displayed for recognition and observation. Learning occurs when all the facilities for study are harnessed for work during a teaching and learning experience (Azikwe2018, Tabotndip 2020). Visual imaginary e.g. pictures charts etc has become the most powerful means of communication in the society today. (Ajayi 2020). Outdoor activities in form of outdoor laboratory learning could be encouraged in form of biology garden, field trips or around the school wall since the activities of the indoor laboratory cannot unfold true happenings in nature or forms of living things e.g. reproduction of amphibians in water, observation of flowering plants, taxonomy of plants and animal. Morphology of living things can be studied in the laboratory to an extent but their activities, influence and interaction with one another in their habitat would be better studied outside the laboratory.

Statement of Problem

It is being observed that memorization of facts have replaced experimentation in Biology among students in secondary schools. This is sad because this subject is expected to be life science. But the researcher observed that most Biology teachers do not expose their students to practical work, instead they prefer to teach only theory aspects of Biology concepts and neglect the practical/Laboratory activities that are expected to accompany the theory lessons. According to (20) the failure to organize practical work for student by their Biology teachers can be attributed to unavailability of Biology laboratory equipment, absence of Biology laboratory, poor motivation on the part of Biology teachers and Biology teachers deficiency in practical skills required to put the available Biology laboratory equipment into productive use as well as lack of improvised instructional materials. Due to this attitude of Biology students towards the learning of this subject, its advancement and breakthrough remains a hope of many decades to come. Research has shown that poor perception over the production of instruction materials in schools, low level of utilization of these materials, Non challant attitude of teachers towards improvisation of materials, poor

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funding, lack of equipment, laboratories are major causes of poor educational materials (resources) in the impermanent of Biology. For leaning to be meaningful and permanent, it is necessary that instructional materials be used. Therefore this study has the problem of finding the impact of biology teachers towards improvisation of instructional materials in teaching and learning of biology among school students in Jema'a local government area of Kaduna state

Objective of the Research of Study

The main purpose of the study is to determine the impact of biology teachers towards improvisation of instructional materials in teaching and learning of biology among school students in Jema'a local government area of Kaduna state. Specifically the study is aimed at determine;

- I. Determine the availability of instruction materials in these schools
- II. Determine the extant students show interest in biology lessons using instructional materials.

Research Questions

1. What Instructional Materials are available in the school?
2. What extent does the students show interest in Biology lessons using instructional materials?

METHODOLOGY

Ogula (2020) describes research design as a plan, structure and strategy of investigation to obtain answers to research questions and control variance. Additionally, a study design is the plan of action the researcher adopts for answering the research questions and it sets up the framework for study or is the blueprint of the researcher (Kerlinger, 2020).

The descriptive survey design was used in conducting the study. According to Akuezuilo and Agu (2019) the survey research is used for collection of standardized information from a sample that is considered as representative of a particular group or population. Hence, the research design was appropriate for the study because it generated

the relevant and useful data from a sample that was representative of the population for generalization.

The study will be conducted at Jema'a is a Local Government Area in southern Kaduna State, Nigeria with headquarters at Kafanchan. The Local Government Council is chaired by Yunana Barde. It has an area of 1,384 km² and a population of 278,202 at the 2006 census. The postal code of the area is 801. The research will be centered on the senior secondary schools and teachers in Kaduna Jema'a Local Government Area.

The method used for the research work is that of survey method, it is a descriptive method of approval on to determine impact of biology teachers towards improvisation of instructional materials in teaching and learning of biology among school students in Jema'a Local Government Area of Kaduna State. According to Bello J.Y. (2017) defined Population of a study as a totality of subjects, elements or an individual for whom a problem is concerned on whom measurement has been made and from whom generalizations are drawn. The population of this study comprise all teachers and students of Jema'a Local Government Area, Kaduna State. The teachers are made up of male and female which are one hundred and fifteen (115) teacher and the students are made of two thousand eight hundred (2,800). Bringing the total population of the study totwo thousand nine hundred and fifteen (2,900).

Out of the 17secondary schools in Jema'a, five schools will be selected using the stratified random sampling technique. Form the five selected schools, 38 students will be selected in each of the five schools selected making it a total of 200 students and two (2) biology teachers in each of the six selected making it a total of 10 teachers.

The instruments for data collection consist of questionnaires and interview. The questionnaires would contain both questions to be answered by the teachers and those to be answered by the students. The instruments provided would answer the research questions. The instrument has four (4) response scales as follows: Strongly Agreed

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(SA), Agreed (A), Strongly Disagreed (SD), Disagreed (D) Questions. The questionnaires were made up of twenty (20) items designed for the students and teachers.

Validity instrument is based on how an instrument fulfills the functions it is supposed to perform. Mugenda and Mugenda (2019) emphasized that validity is a degree to which results obtained from the analysis of the data actually represent the phenomenon under study. The research instrument was piloted in two schools which are not part of the selected schools for the study. The piloting was done to establish the construct validity of the instruments (Mugenda & Mugenda, 2018). The test items were found to be valid. Validity is a check of test, efficiency and stability to major what is expected to measure in order to minimize errors and mis-interpretations. Validity is of two types that is content and face validity.

The method used in collecting data for the study was by administration of the instruments directly by the researchers. A total

of 200 copies of the questionnaire was shared to the respondents in the six sample schools.

Data analysis techniques are statistical methods used to analyze data so that it can be interpreted (Kombo & Tromp, 2020). It involves computation of certain measures along with the searching patterns of relationships that exist between the dependent variable and independent variables. The data was analyzed using descriptive statistics based on the themes and objectives of the study. The descriptive technique involved calculating means, standard deviation and correlations. Correlation analysis was used to determine the relationship between dependent and independent variables. Data was screened, coded and analyzed through statistical package for social science (SPSS, version 21.0).

RESULTS AND DISCUSSION

Research Question: What instructional materials are available in the school?

Table 2. Available instructional materials in the school

S/NO	Statement	MEAN	S.D	Remark
1	Magnifying glasses	3.7	1.9	Available
2	Microscope	3.2	1.8	Available
3	Hand lens	2.6	1.6	Not Available
4	Preserved Specimens	2.2	1.5	Not Available
5	Test-reagents or Chemicals	4.0	2.0	Available
	Total	3.1		

Source: Field Survey, (2023)

The tables 2 above revealed that there is availabilities of instructional materials in the study area since there is a cumulative mean agreement level of 3.1 which is in the accepted region.

Research Questions 2: To what extent does the students show interest in Biology lessons using instructional materials?

TABLE 2. Students' interest in Biology lessons using instructional materials

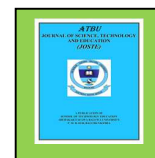
S/NO	Statement	MEAN	S.D	Remark
1	How often does the use of instructional material help you in teaching and learning Biology?	3.5	1.9	Great Extent
2	Do you always enjoy the lesson while using models?	3.1	1.8	Moderate Extent
3	Do you get tired when your teacher is teaching you with instructional materials?	3.4	1.8	Moderate Extent
4	Do students always show interest while using	1.8	1.3	Low Extent

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S/NO	Statement	MEAN	S.D	Remark
5	handless. How often do student ask questions during biology classes.	3.6	1.9	Great Extent
	Total	3.1		

Source: Field Survey, (2023)

The table above indicated that students show interest in Biology lessons using instructional materials in the study area, since the cumulative mean agreement was 3.1.

DISCUSSION OF FINDING

There is inadequate supply of instructional materials in the secondary schools, this finding agrees with the earlier ones by Esu (2012) and Olagbaju (2015). They both agreed based on their findings that there is inadequate supply of instructional materials especially in public secondary schools. Private schools have more instructional materials. There are more play materials in. The schools have more instructional materials because there is laid down guidelines which must be followed before the approval and registration of such a school. Therefore, the private schools tend to meet to a large extent the requirement for approval. Without approval, schools are not recognized by government, unlike the public schools which are recognized with or without the required facilities and materials. Teacher's qualification affects their utilization of instructional materials in the secondary schools, Teachers make use of available instructional materials in the secondary schools, and the observed difference may not be unconnected with the fact that private schools closely supervise their teachers more than public schools. It thus appear that the normal attitude, that anything government, should not be taken seriously, prevails in the public schools. The findings above supports that of Abinbade (2016), Olagbaju (2015) and Olowookere (2013) which revealed that materials availability does not guarantee utilization. Olowookere noted that instructional materials are more used in the private schools. This phenomenon exists because of the close supervision of the teachers by the proprietors/Head teachers. Teacher's experiences affect their utilization of instructional materials in secondary schools,

the findings above agree with Bowles (2011), Ologbaju (2015) and Olowokere (2015). They all maintained that the teachers qualification have significant influence on the teachers utilization of instructional materials. This has become so as a result of the fact that as they acquire higher certificate and degrees, they acquire more exposure and knowledge on instructional materials

CONCLUSION

From the study findings it is apparent that many schools in the study area do use appropriate instructional materials. They have instructional materials that the schools needed, they improvise their own. Although all the teachers agree that instructional materials are important in contributing to students' academic performance, they show a need to have these materials in their classrooms. This implies that, the teachers have the knowledge about the importance of instructional materials, they develop them. This may have many reasons. One could guess that teachers do care about the student's performance, and this is from the management point of view, may emanate from high morale and motivation towards their teaching. Another explanation may be, good supervision from their heads of schools. Normally, heads of schools are supposed to be instructional supervisors, to ensure that instructions are going on and students are provided with quality education coupled with quality instructional resources.

RECOMMENDATIONS

Basing on the findings from this study the following are the recommendations;

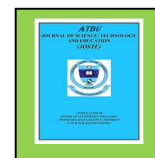
1. The government should strive and set aside a reasonable amount of education budget which will be directed to improve and construct libraries/laboratory in schools like what it did to promote laboratories in schools.

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2. The heads of schools should rise their voice to be heard by parents as well as the government on the importance of improving and promoting good instructional materials in public schools and that success or failure of a student will not only depend on the content that the students receive in class as well as access to materials for further review by his or her own.
3. The parents should not sit down and wait for the government to effect on the availability of libraries and other valid learning materials and facilities in schools.

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