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Utilization Of Instructional Materials For Effective Teaching And Learning Of Biology In Otuocha Education Zone Anambra State

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ABSTRACT

The study investigated the utilization of instructional Materials for Effective Teaching and Learning of Biology in Otuocha Education zone, Anambra State. Four research questions guided the study. The population comprised of Seventy two biology teachers. A sample of seventy two (72) biology teachers was used. The design was a survey research design, instrument for data collection was a questionnaire title structured or fixed response questionnaire (SFRQ) questionnaire which was developed by the researchers. The instrument was validated by staff from department and Education both from Nwafor Orizu College of Education Nsugbe. The reliability of the instrument was determined using Pearson product Moment Correlation Coefficient (r) which yielded a valued of 0.70. Data collected were analyzed using mean and standard deviation. The major findings were as follows: that teachers used instructional material to enhance teaching and learning of biology; some of the problems associated with the use of instructional material in teaching and learning include lack of fund, electricity, etc . These problems should be eradicated in order to enhance the effectiveness use of instructional materials. Recommendations were made and suggestion for further studies were also highlighted.

Keywords: SFRQ, instructional material, biology, teachers.

INTRODUCTION

Science has made countless contributions to the realization and advancement of the contemporary world and it has been attributed as the foundation for technological breakthrough in this modern world. It is therefore not a surprise to see the Nigerian government fighting to make all efforts to develop science and technology. Science is a dynamic human activity concerned with understanding the workings of the world we live in (Nworgu,2015). This understanding helps man to know more about the universe. Man would have found it difficult to explore his immediate environment without the application of science to his day to day activities. Science comprises the basic subjects such as mathematics, physics, chemistry, agriculture and Biology.

Biology is the study of life, it is gotten from two Greek words “bios” meaning life and “logos” meaning study. Biology is a branch of natural science that deals with the living and non living organisms. It is concerned with how man react to his immediate environment (Umar, 2019). It is a compulsory subject that must be offered in Secondary Schools and a pre requisite for many fields of learning most importantly. In the faculty of science and some departments in tertiary institutions in Nigeria. This includes medicine, Pharmacy, nursing, agriculture, forestry, biotechnology, nanotechnology and many other areas (Ahmed & Abimbola,2017). Biology is regarded as one of the compulsory subjects in Nigerian secondary school curriculum. Because of its importance, more students enrolled for biology in the senior secondary school certificate examination (SSCE) therefore other science subjects (West African Examination Council, 2017). Biology is introduced to students at Senior Secondary level as preparatory ground for human development, where career abilities are groomed and potentials and talent discovered and energized. The quality and quantity of science

education received by Secondary School Students are geared towards developing future scientists, technologist and engineers and elated professionals (Kareem, 2016). Inspite of the importance and popularity of biology among Nigerian students, performance at Senior Secondary School level has been poor (Ahmed, 2016).

However, it has been observed over the years throughout the country that lack of instructional materials in many schools in Nigeria has brought about considerable drop in the academic performance of Senior Secondary School Students especially in some science subjects like biology, chemistry, physics, mathematics. Instructional materials are teaching aids or materials used to illustrate the teaching process and make instruction more compressive to the learners.

Instructional Material and teaching and learning procession and consequently the attainment of the aims and objectives of the lesson. However, this depends on the availability of Materials indeed instructional materials to be used should be carefully, selected by the teachers. Remillard and Heck (2018), defined instructional materials as resources that organize and support instruction such as textbooks, tails, and supplementary resources. According to Lewis (2019), instructional material also known as teaching / learning materials (TLM), are any collection of materials including animate and inanimate objects and human and non-human resources that a teacher may use in teaching and learning situations to help achieve desired learning objectives.

Instructional materials can be classified by types, including print (e.g textbooks, pamphlets, handouts, study guides, manuals etc); visual (eg, charts, real objects, photographs, transparencies, etc.), audiovisuals, (e.g Slides, tapes, films, filmstrips, television, video, multimedia, etc.) and electronic interactive (eg. Computers, graphing, calculation , tablets, etc.). this use of audiovisual material is not without justification as they are considered relevant to curriculum improvement and general learning teaching process. The use of instructional material cannot be overemphasized instructional materials as a resource cannot be separated …….teaching, otherwise it could paralyze the entire system or process, when neglected. The Nigeria Educational system has been facing a lot of critical problems amongst which are increasing enrolment, shortage of qualified teachers, absence of laboratories, acute shortage of necessary teaching and learning materials. Therefore there is need to investigate the utilization of instructional material for effective teaching and learning of Biology in Otuocha Education Zone of Anambra State.

State of Problem

Improper use of available resource in teaching by biology teachers have been a major problem and have hindered some expected goals or objectives from being realized. Effective utilization of instructional materials by biology teachers can create room for effective teaching and learning. Inadequate materials, population explosion, inaccessibility of local material resource, non availability of instructional materials, incompetent teachers, ineffective method of storage after use, among others. Some of there problems are often so severe that available in school but not in use by teachers and students. It is in view of those problems stated above that necessitated in project topic utilization of instructional material for effective teaching and learning of biology in Otuocha Education Zone of Anambra State.

Purpose of the study

The purpose of this study is to examine the utilization of instructional material for effective teaching and learning of biology in Secondary Schools in Otuocha Education Zone. Specifically, the researcher intends to determine:

1. The extent of the available instructional material in Secondary School in Otuocha Education Zone.
2. The extent the available instructional materials are adequately used in teaching and learning by biology teachers.
3. The teachers hindering the effective utilization of instructional materials in Otuocha Education Zone.

Research question

The following research questions guided the study:

1. To what extent are instructional materials available for teaching and learning of Biology in Otuocha Education Zone.

2. To what extent do biology teachers make use of instructional materials for effective teaching and learning of biology in Otuocha Education Zone.
3. What are the constraints of the effective use of instructional materials in teaching and learning of Biology in Otuocha Education Zone.

METHOD

The design for this study was survey research design the population of the study consisted of seventy two (72) biology teachers in government owned Secondary School in Otucha Education Zone. In Anambra East was (59) Fifty nine biology teachers while in Anambra West was (4) four biology teachers and in Ayamelum was nine (9) biology teachers, marking the total population of teachers to be 12, biology teachers in Otuocha Education Zone.

No random sampling was done due to low population, the whole biology teachers from 26 Government Owned Secondary school in Otuocha Education Zone were used.

Structure questionnaire which was validated by experienced staff from department of Biology and Education, both from Nwafor Orizu College of Education, Nsugbe, Served as the instrument for data collection.

The structured questionnaire formulated by the researcher was used as instrument for data collection is contained section A and B section A has personal data items, while, Section B contains the questionnaire items.

The four point liket scale with options as follows was employed: Strongly Agree (SA), Agree (A) Disagree (D) Strongly Disagree (SD). Very High Extent (VHE), High Extent (HE), Low Extent (LE), Very Low Extent (VLE) To ascertain the reliability of the instrument , the questionnaires were distributed to (10) biology teachers in Onitsha education zone. The data collected was analyzed to determine the reliability of instrument using Pearson product moment correlation co-efficient (r) which yielded 0.70.

The researcher administered the questionnaires to the respondent through direct delivery technique (DDT). This was to ensure high rate of questionnaires return at the end of the exercise, to ensure that respondent completed the questionnaire given to him/ her rather than being influenced by others. The researcher analyzed the data obtained by computing the mean only based only based on the four rating scale. The mean rating of 2.50 was adopted as the point 2.50 is accepted while any score that is below 2.50 is rejected.

RESULTS

Results of the study are presented in table according to researcher questions

Research Question One: *To what extend are instructional materials available for teaching and learning of biology?*

Table 1. Mean ratings on the extent to which instructional materials are available for teaching and learning of biology.

S/N	ITEMS	VHE	HE	LE	VLE	X	Decision
1	Instructional materials are easily and readily accessible to Biology teachers.	9	3	53	7	2.19	Rejected
2	There are adequate instructional material available to Biology teacher.	60	10	-	2	3.94	Accepted
3	Some of the required instructional materials are expensive for Biology Teachers to acquire	-	-	70	2	1.97	Rejected
4	Instructional materials are adequately provided by the school and the government	50	10	2	10	3.38	Accepted
5	Instructional materials are limited to exam classes only	3	5	10	54	1.40	Rejected
6	Instructional materials are made available for teaching only difficult topics.	38	20	6	8	3.22	Accepted
7	Instructional materials are available only during external examination.	10	10	39	13	2.23	Rejected
8	Some of these instructional materials needed by the teachers are not always available	70	2	-	-	2.94	Accepted

From the table above, the information obtained showed that the item number 1,3,5 and 7 had the mean score of 2.19, 1.97 , 1.40 and 2.23 respectively. Therefore are rejected because they fall below the cut-off point of 2.50, while items 2,4,6 and 8 with the mean scores of 3.94, 3.38, 3.22 and 2.94 were accepted because their mean scores were above the cut-off point of 2.50.

Hence, the answer to the data in table one above is that the adequacy of instructional materials in teaching and learning of biology is 50:50 since half of the questionnaire items are only accepted. The interpretation is that; instructional materials are not easily and readily accessible to biology teachers, some of the instructional materials are not expensive for biology teachers, some of the instructional materials are not expensive for biology teachers to acquire, instructional materials are not limited only to exam classes, and also that instructional materials are not only available during external examination.

Research Question Two: *To what extent do biology teachers makes use of materials for teaching and learning of biology?*

Table 2: Mean rating on the extent to which biology teachers make use of instructional materials for teaching and learning of biology.

S/N	ITEMS	VHE	HE	LE	VLE	X	Decision
9	Biology teachers can easily improvise some of the instructional materials which are not available	7	5	47	13	2.12	Rejected
10	Biology teachers use instructional materials to introduce and stimulate students in the topic of the lesson	-	-	72	-	2.0	Rejected
11	Biology teachers use instructional materials to enhance students' understanding and concretize what is being taught to them.	30	20	10	12	2.94	Accepted
12	Biology teachers use instructional materials to explain in a more meaningful way, difficult topics to the pupils.	62	5	5		3.9	Accepted
13	biology teachers used instructional materials to demonstrate specific skills and techniques during lesson.	-	-	42	30	1.58	Rejected
14	Biology teachers use instructional materials to enhance the educational experimental background of the students.	58	14	-	-	3.80	Accepted
15	Biology teachers use instructional materials to give factual information about a topic.	50	12	8	2	3.52	Accepted

From the table above, the information obtained showed that the items number 9,10, and 13 had the mean score of 2.12 , 2.0 and 1.58 which were rejected because their mean scores are below the cut-off point of 2.50, while items 11, 12, 14 and 15 which had the mean score of 2.94, 3.9, 3.80 and 3.52 were accepted because their scores are above the cut-off point of 2.50.

The answer to the questionnaire items in table two above indicates that biology teachers often times use instructional materials to give factual information about some topics, enhance the experimental educational background of the students, explain in a more meaningful way, difficult topics to the pupils, enhance students' understanding and concretize what is being taught.

Research Question Three: *What are the constraints on the use of instructional material in teaching and learning of biology?*

Table 3: Mean ratings on the constraints experienced by biology teachers in using instructional materials in teaching and learning of biology.

S/N	ITEMS	SD	A	D	SD	X	Decision
16	The allocation time to biology lesson period is not enough to allow effective utilization of instructional materials.	-	-	42	30	1.58	Rejected
17	Some of the instructional materials are small and are not usually legible by the students.	50	10	2	10	3.38	Accepted
18	There is insufficient fund for provision of instructional materials	3	5	10	54	1.40	Rejected
19	Some of the instructional materials which are fragile and other corrosive chemicals exposed students to hazardous situations	72	-	-	-	4.00	Accepted
20	Some of the biology laboratories are not large enough to accommodate the students during biology practical's	50	10	2	10	3.38	Accepted
21	Some of the biology teachers do not know how to operate instructional materials and cannot make use of them effectively.	9	3	53	7	2.19	Rejected
22	Some of the instructional materials are not maintained properly.	3	5	5	59	1.90	Rejected

The table 3 above shows that items 16,18,21 and 22 have the mean score of 1.58, 1.40, 2.19 and 1.90 respectively showing that it was rejected because their rating fall below the cut-off point 2.50, while items 17,19 and 20 with the mean score of 3.38, 4.00 and 3.38 respectively are above 2.50 cut-off point which are all accepted by the respondents.

Therefore, from the data above in table three, it was revealed that laboratories are not large enough to accommodate the students during biology practicals, some of the instructional materials are small and are not usually other corrosive chemicals which may expose student to hazardous situation among others, tend to pose constraints on the use of instructional materials in teaching and learning of biology.

DISCUSSION OF RESULTS

The findings showed that the instructional materials needed by the teachers are not usually available. Besides, some of the instructional materials are small and are not usually vivid for the students during practicals and classroom exercises. When there are enough instructional materials, it affects the learning interest of the student. This is in line with Oni (2015), who stated that the availability and adequate use of instructional materials promotes effective teaching and learning activities in schools while their inadequacy affect the academic performance negatively. Thus these are the findings which were discussed in table 1.

The findings revealed in table II that teachers do not easily improvise instructional materials that are not available in teaching the students. This is well known that it will result to frustration to the students. But when there is an improvised instructional material as a result of the lack of the main instructional materials or materials, it enriches the experimental background of the students. Instructional materials give factual information. This is in line with Hazel (2010), who makes it clear that the value of instructional materials in teaching and learning draws a child's attention to national phenomena and soon make him/her curious. He also laid emphasis on "what we hear we forget, what we see we remember, and what we do, we know". This showed that it is important to teach biology with equipment which can be seen and handled by students.

The findings in table III showed that biology teachers effectively utilized the available instructional materials and it is similar to that if Akano (2015), and Eze (2012), that rightly pointed out that

instructional materials can only be utilized when they are available. Osakwe (2010), remarked that teachers should adopt the habit of improvising laboratory equipment that are currently not in place or non-functional in their schools in order to improve teaching and learning process unlike in the second paragraph where it was discovered in the finding that the teachers do not always improvise some instructional materials needed by the students to enhance their learning process.

A poor practical work was observed in few school laboratories in table III. This was in line with findings of Obagha (2019), who emphasized over a general lack of infrastructural facilities in Nigeria Secondary Schools. The inadequacy of teaching materials, laboratory equipment and laboratory space has been of serious concern to educator. Mapaderun (2012 & Oni (2015), also emphasized that the availability and adequacy of these facilities promote effective teaching and learning activities in schools while their inadequacy affect the academic performance negatively.

CONCLUSION

From the findings, the researchers concluded as follows; that laboratories not being large enough to accommodate the students during biology practicals, instructional materials needed by the teachers not always being small and illegible by the students, inability of Biology teachers to readily and easily improvise instructional materials when they are not available, and the fragile instructional materials and other corrosive chemicals tending to expose students to hazardous situation were problem militating against utilization of instructional materials for effective teaching and learning of Biology in Otuocha Education Zone.

RECOMMENDATIONS

On the basis of the finding above, the following recommendations were made:

1. Teachers should teach biology lessons both theoretically and practically; this will give the students a better understanding of what was being taught.
2. There should be more time allocation to biology lesson periods to enable the teachers to effectively utilize the available instructional materials.
3. Regular use of instructional materials should be adopted by all secondary school biology teachers for teaching biology, particularly those with practical components.
4. Government should make funds available for the provision of the relevant instructional materials and other teaching equipment.

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