

EFFECTIVE UTILIZATION OF AVAILABLE INSTRUCTIONAL RESOURCES FOR TEACHING BIOLOGY IN SECONDARY SCHOOLS IN IBARAPA REGION OF OYO STATE

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Abstract

This paper examined the effective utilization of available instructional resources for teaching Biology in the secondary schools in Ibarapa Region of Oyo State. Survey research design was adopted. Twenty (20) Biology teachers participated in the study. Two research questions and two hypotheses guided the research. The instrument used was teachers' questionnaire (QTEUIR). Tables and mean scores were used in analyzing the research questions, while t-test at 0.05 level of significance was used to analyze the hypotheses. The findings revealed that there were insufficient instructional resources for impacting Biology concepts in the secondary schools in Ibarapa Region of Oyo State. In addition, there were no statistically significant differences in the effective utilization of instructional materials between professionally qualified and unqualified biology teachers and as well between experienced and less experienced teachers. Therefore, it is recommended that Biology teachers should develop creativity of improvisation of instructional resources to minimize teaching in abstract.

Keywords: Biology, Creativity, Improvisation, Instructional Resources.

Introduction

Biology is a natural science subject consisting of contents ranging from microscopic organisms to the biosphere in general, encompassing the earth's surface and all living things (Okwo and Tartiyus, 2004). Considering its fundamental importance, it is the prerequisite subject for many fields of learning such as medicine, agriculture and pharmacy, and contributes immensely to the technological growth of the nation (Ajewole, 2006).

The search for efficient and effective delivery of biological concepts to students has always been a major concern of Biology educators. Although the modern approach to the learning of science generally has shifted from rote learning of the accumulated facts to laboratory investigation (James 2013), the learning through practical work is more firmly fixed in the memory than learning through other methods (Olagunju and Abiona, 2008). Biology is a practical oriented

subject and students get interested when they are involved in the learning process (Osinem, 2009). Based on this, there is need for effective use of relevant instructional materials for teaching Biology. However, whether these materials are available in the right quantity and or can be effectively utilized by the Biology teacher is another issue. It is on this fact that this research was set out to examine the effective utilization of available instructional materials for teaching Biology in the secondary schools in Ibarapa Region as a case study.

Instructional materials have been identified as part of the teaching-learning facilities teachers and students use to express ideas without difficulties. They make lesson interesting, motivating and easy to understand. Osula (2010) asserted that instructional materials do not only motivate and develop students' interest, but also ease teachers' dispensation of knowledge to the students. Iwu, Ijioma, Omoja & Nzewuche

(2011) were of the opinion that instructional materials are those objects that are commercially acquired or improvised by the teacher to make conceptual abstraction more concrete and practical to learners. Generally, according to classification, there are audio aids - those resources that appeal to the sense of hearing only; visual-aids - those that appeal to the sense of sight; and audio-visual aids - those that appeal to both senses of hearing and sight at the same time. Some of these materials are difficult to procure on account of their cost and availability, many can therefore be improvised by a resourceful teacher (Awolaju, 2016).

However, the importance of instructional materials in teaching and learning is too obvious to be over emphasized. Lawal (2013) viewed such materials as those that promote learning by doing, make classroom lively, real and meaningful and have the potential to make the content permanent thereby increase students' performance. Learners focus their attention to important issues and hence acquire practical skills which help them combat unemployment and poverty. According to NTI (2007), instructional materials help the teacher to deliver his lesson effectively in the classroom and also enhance memory level and effective learning of students. In addition, these aids increase the rate of learning, save the teacher's time and effort, increase learners interest and facilitates retention of what is learned (Danmole & Adebayo, 2005, Danmole & Lameed, 2014).

Statement of the problem

The objectives of teaching biology at secondary school level as stated by National Policy on Educational FME (2004) involve ability of the learners to develop an awareness of the environment, to have meaningful and relevant knowledge in Biology necessary for successful living in a scientific and technological world and to make room for technological advancement. Regrettably, many Biology teachers in secondary schools teach the subject using lecture method. This act makes it difficult to achieve those objectives and also the achievement of students in the subject, especially at SSCE level has considerably

remained poor. This study therefore examines the effective utilization of available instructional materials for teaching Biology.

Research Questions

The following research questions guided the study.

1. What are the instructional resources available for teaching biology in secondary schools in Ibarapa Region?
2. What is the extent of utilization of instructional resources for teaching biology in public secondary schools in Ibarapa Region?

Research Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance.

1. There is no significant difference in the effective utilization of instructional resources between educationally qualified and unqualified senior secondary school biology teachers.
2. There is no significant difference in the extent of utilization of instructional resources between the experienced and less experienced senior secondary school biology teachers.

Methodology

Research Design

The study adopted a descriptive survey research design.

Population of the study

The population of this study comprised 20 biology teachers in secondary schools in Ibarapa Region of Oyo State. The schools utilized were located in the following towns in Ibarapa region.

1. Eruwa
2. Lanlate
3. Igboora
4. Igangan
5. Ayete
6. Tapa
7. Idere

Sample and sampling technique

The sample for the study comprised twenty (20) biology teachers (Male and Female)) randomly selected from thirty (30) public

senior secondary schools in Ibarapa Region. The selection of respondents was done with the help of research assistants.

Instrumentation

The research instrument used for this study was questionnaire. A self developed questionnaire titled "Questionnaire on Teachers Effective Utilization of Instructional Resources" (QTEUIR) was used to collect relevant information from the respondents. It comprises two sections.

Section A sought demographic information on teachers' academic qualification, area of specialization and years of teaching experience. Section B contains some statements which the teachers respond to by ticking responses such as 'available' or 'Yes' were assigned a score of 2 while negative responses such as 'No' or 'not available' were assigned 1 for simple statistical analysis.

Validation of Instrument

The instrument was given to a research experts in the Faculty of Education, University of Ibadan for face and construct validation. The instrument was trial-tested and the reliability was computed using Cronbach alpha which was estimated at 0.82.

Data Collection and Analysis

The instrument was administered directly to the respondents by the researchers and retrieved immediately. Data collected were analysed using mean scores while hypothesis were tested using t test statistics at 0.05 level of significance.

Results

Research question 1

What are the instructional resources available for teaching biology in the secondary schools in Ibarapa Region of Oyo State?

Table 1: Availability of Instructional resources for teaching Biology

S/N	Instructional Resources	Available (2)	Not Available (1)	Mean	Decision
1	Film strips	5	1	1.25	Not Available
2	Slide projector	6	1	1.3	Not Available
3	Overhead projector	3	1	1.15	Not Available
4	Text books	2	0	2	Available
5	Photographs and pictures	5	1	1.25	Not Available
6	Flash cards	1	8	1.9	Available
7	Chart	2	0	2	Available
8	Diagram	9	1	1.45	Not Available
9	Prepared slides	2	1	1.1	Not-Available
10	White marker board	3	1	1.15	Not Available
11	Black/chalkboard	2	0	2	Available
12	Flannel/felt board	2	1	1.1	Not Available
13	Model of organs	4	1	1.2	Not Available
14	Specimens (Preserved)	1	7	1.85	Available
15	Videotape	6	1	1.3	Not Available
16	Plant album	2	1	1.1	Not Available
17	Microscope	4	1	1.2	Not Available
18	Hand lens/magnifying glasses	7	1	1.35	Not Available
19	Dissecting kit	2	1	1.1	Not Available
20	Aquarium	0	1	1.15	Not Available
21	Biological garden	3	1	1.15	Not Available
22	Human skeleton	5	1	1.25	Not Available
23	Quadrants	2	1	1.1	Not Available
24	Food test reagents	4	1	1.2	Not Available

25 .	Separate standard biology laboratory.	2	1	8	1 . 1	Not Available
	O v e r a l l m e a n				1 . 3 5	

Table I above shows the responses of Biology teachers with regard to the availability of instructional resources for imparting biology concepts in their various schools. The available instructional resources are text books (2.00), charts (2.00), black/chalkboard (2.00) and preserved specimens (1.85). Other instructional materials listed on the table are not available.

The overall mean of responses to availability of instructional resources -is (1.35) which indicates non-availability of instructional resources for teaching biology in Ibarapa Region of Oyo State.

Research questions 2: What is the extent of utilization of available instructional resources by biology teachers for teaching biology concepts?

Table 2: Responses by Biology teachers on the extent to which they can utilize instructional resources for teaching Biology concept effectively

I can effectively utilize the following resources for teaching biology.

S / N	Instructional Resources	True. (2)	False (1)	Mean	Decision
1 .	F i l m s t r i p s	2	1 8	1 . 1	Disagreed
2 .	S l i d e p r o j e c t o r	3	1 7	1 . 1 5	Disagreed
3 .	O v e r h e a d p r o j e c t o r	2	1 8	1 . 1	Disagreed
4 .	T e x t b o o k s	2 0	0	2 . 0 0	A g r e e d
5 .	Photographs and pictures	8	1 2	1 . 4 0	Disagreed
6 .	F l a s h c a r d	3	1 7	1 . 1 5	Disagreed
7 .	C h a r t s	2 0	0	2 . 0 0	A g r e e d
8 .	D i a g r a m	2 0	0	2 . 0 0	A g r e e d
9 .	P r e p a r e d s l i d e s	7	1 3	1 . 3 5	Disagreed
1 0 .	White marker board	2 0	0	2 . 0 0	A g r e e d
1 1 .	Black/ chalk board	2 0	0	2 . 0 0	A g r e e d
1 2 .	Flannel/felt board	2	1 8	1 . 1	Disagreed
1 3 .	M o d e l s o f o r g a n s	3	1 7	1 . 1 5	Disagreed
1 4 .	Preserved specimens	2 0	0	2 . 0 0	A g r e e d
1 5 .	V e d e o s	3	1 7	1 . 1 5	Disagreed
1 6 .	P l a n t a l b u m	6	1 4	1 . 3	Disagreed
1 7 .	M i c r o s c o p e	4	1 6	1 . 2	Disagreed
1 8 .	Hand lens/magnifying glasses	2 0	0	2 . 0 0	A g r e e d
1 9 .	D i s s e c t i n g k i t	2	1 8	1 . 1	Disagreed
2 0 .	A q u a r i u m	2	1 8	1 . 1	Disagreed
2 1 .	B i o l o g i c a l g a r d e n	5	1 5	1 . 2 5	Disagreed
2 2 .	H u m a n s k e l e t o n	3	1 7	1 . 1 5	Disagreed
2 3 .	Q u a d r a n t s	3	1 7	1 . 1 5	Disagreed
2 4 .	F o o d t e s t r e a g e n t s	2 0	0	2 . 0 0	A g r e e d
	O v e r a l l m e a n			1 . 5 0	

Table 2 shows responses of biology teachers as regards effective utilization of instructional resources for imparting biological concepts. The resources they can use effectively

include white marker board, black/chalk board, textbooks, charts, diagrams, preserved specimens, food test reagents and magnifying glasses.

Hypotheses

H0 1: There is no significant difference in the effective utilization of instructional resources between educationally qualified and unqualified senior secondary school biology teachers.

Table 3: T-test on effective utilization of instructional resources

R e s p o n s e	N	M e a n	Mean diff	t-cal	t-critical	D e c i s i o n
Qualified teachers	13	12.73	5 . 1 3	1.56	2 . 4 7	Not significant
Unqualified teachers	7	17.80				

0.05 level of significance

Table 3 above shows that the calculated t of 1.56 is less than t critical of 2.47. This was not significant at 0.05 level, hence there is no significant difference between professionally qualified and unqualified biology teachers' ability to effectively utilize instructional resources.

H02: There is no significant difference in the extent of utilization of instructional resources between the experienced and less experienced biology teachers.

Table 4: T-test of extent of utilization of instructional resources

R e s p o n s e	N	M e a n	Mean diff	t-cal	t-critical	D e c i s i o n
Experienced teachers	15	11.09	0 . 6 7	0.86	2 . 1 0	Not significant
Less experienced teachers	05	10.42				

0.05 level of significance

Table 4 above shows that t calculated of 0.86 is less than t critical of 2.10. This was not significant at 0.05 level, hence there is no significant difference in the extent of using instructional resources between experienced and less experienced teachers of biology.

Discussion

Judging by the findings, it is evident and was clearly indicated that the instructional resources were insufficient in the schools under study. This result corroborates the observation of erudite scholars like Effiong, Ekpo and Igin (2015) that posited that the instructional materials available for teaching biology in secondary schools in Yakurr Local Government in Cross River State are grossly inadequate. The only resources that are available in adequate quantities are charts, textbooks and chalkboards. This implies that biology would be taught in abstract and students would continue to learn by memorizing the concepts. This finding

support previous assertion by Nwagbo (2007) that most biology teachers teach theoretical aspects of biology neglecting the weightier practical aspects which has the potential for developing critical thinking and objective reasoning abilities in students.

In addition, findings from research carried out by Aderonmu (2000) revealed that students complained of non-familiarization with biology laboratory equipment until a few weeks to the external examination. Even some teachers of this subject did not know the use of some laboratory equipment items that were available until the practical examination period. Also, Ige (2000) and Agbowuwo and Oriade (2006) revealed that teachers lack creativity, awareness and practice in the teaching of practical biology.

Conclusion

The findings derived from this study include:

- i. Instructional materials available for teaching of Biology in Secondary Schools are grossly inadequate and this negatively affects effective teaching and learning.
- ii. There were no statically significant differences in the effective utilization of available instructional material between professionally qualified and unqualified biology teachers and as well between experienced and less experienced teachers.

In the light of the above, teachers should not take advantage of inadequate and lack of instructional materials as an excuse to result to poor teaching and learning but instead they should learn to improvise instructional materials to be used effectively in teaching Biology.

Recommendations

Based on the findings of this study, the researcher recommends that:

- ❖ Government should ensure availability of modern instructional resources in all public secondary schools to enhance effective teaching and learning of biological concepts.
- ❖ The government should organize workshops, seminars and conferences for teachers to update their knowledge on new developments on the use of instructional materials.
- ❖ Teachers should involve students in the production of simple instructional materials to develop creativity in students.
- ❖ Resource centers should be established by government to allow borrowing of instructional materials that are not available in school.
- ❖ Teachers should be well remunerated in order to boost their morale to perform their duties more effectively.

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