

EFFECTS OF VIDEO AND AUDIO-TAPED INSTRUCTIONS ON STUDENTS' ACHIEVEMENT IN BIOLOGY IN SECONDARY SCHOOLS

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Abstract

This work studies the effects of two instructional media -video and audio- tape instructions on students' achievement in biology in secondary schools in Igbo-Etiti Local Government Area. Two research questions and one null hypothesis guided the study. A randomized posttest only group design was used for the study. A simple random sampling technique was used to draw 60 students that participated in the study. Data was collected using a Biology Achievement Test [BAT]. Means were used to answer the research questions while Analysis of Variance [ANOVA] was utilized to analyze the null hypothesis. The study found (hat group taught with video-tape performed better than those taught with audio-tape. Also males did better than females when taught with video-tape while females performed higher than males when exposed to audio-tape.

Introduction

Biology is the study of life, it is driven front Greek words "bios" meaning life and "logos" meaning knowledge, which in practice means the study of living things [Mackean.1977]. Biology is one of the core science subjects being implemented at the 3-tier secondary education system in Nigeria. The new senior secondary school biology curriculum has (his as its major aims [FME, 1984]:

- ✓ Adequate laboratory and field skills in Biology.
- ✓ Meaningful and relevant knowledge in Biology.
- ✓ Ability to apply scientific knowledge to every day life, matters of personal and community health and agriculture.
- ✓ Reasonable and functional scientific attitudes.

To accomplish these noble objectives, the teaching of biology in secondary schools would require the biology teachers to introduce activity-based strategies. However, many biology teachers in our secondary schools still teach biology using method which literature (Ogunniyi, 1985,Ajewole and Okebukola, 1988), have found to be efficient in promoting only rote learning. Joju (1979) and Ajewole (1990, 1991), recognized learning by rote as one of the major factors opposing effective science teaching in Nigeria.

Other reasons ranged from lack of appropriate learning environment under which biology teaching takes p'ace (Mba and Abdulahi, 1985), to total lack of opportunity for the child to have a direct experience with learning materials [Bajah, 1977],

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The problem confronting teaching-learning process in Nigeria according to Okpala (1981), is that even though teachers know that learning takes place in a variety of ways, teachers still cling to talk- chalk process as the only medium of imparting knowledge. He asserted that they have not yet turned themselves to the importance and use of other instructional methods in facilitating teaching and learning.

There is need to adopt new instructional approaches that deviate in style of teaching from the conventional approach presently being used. Video-tape instruction refers to the use of video tape to present information, idea and experience in any subject area. Video tape appeals to both senses of hearing and sight. Audio -taped instruction on the hand is the use of audio cassette to deliver instruction. Audio sensitizes the sense of hearing only.

The overall performance of candidates in Senior Secondary School Certificate Examination [SSCE] in the recent years have continued to be below expectation [WAEC Chief Examiners' Report, 2000, 2001, 2004, and 2005], The identified weakness include inability of the candidates to relate the application of biological concepts to given situation and their dependent on rote memorization rather than understanding of biological concepts to reason out solutions etc. There is need to introduce varieties in the instructional approaches in teaching and learning of biology. It is against this background that this study is designed to investigate the effects of audio and video-taped instructions on students' achievement in biology in senior secondary schools.

Research Questions

The following research questions guided the study:

1. What are the effects of audio-taped instruction on the students' achievement in biology?
2. What are the effects of video-taped instruction on the students' achievement in biology?

Hypothesis

One null hypothesis was formulated for this study and tested at 0.05 level of significance

There is no significant difference between the mean scores of males and females taught biology with audio and video-taped instructions.

Methodology Design of the Study

The design of study is true experimental research design. The study utilized a Randomized Posttest Only Group design. The subjects were assigned to the groups by

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This design can be represented diagrammatically as follows:

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Where

R-Random assignment of subjects to experimental groups

E1-Experimental group I

E2-Experimental group 2

X-Treatment given to the experimental groups

O-Posttest given to the experiment groups

Area of the Study

The study was carried out in secondary schools in Igbo-Etiti Local Government Area of Enugu state. There are fourteen senior secondary schools in the local government area.

Population of the Study

The population of the study consisted of all the senior secondary students in Igbo-Etiti Local Government Area of Enugu state.

Sample and Sampling Techniques

Simple random sampling technique was used to draw two schools that were used for study. Proportionate stratified random sampling technique was used to draw 15 boys and 15 girls for each of the two experimental groups. In all, sixty [60] students participated in the study. The sample distribution is shown in Table 1.

Table 1: Distribution of Sample

Group	Girl	Boy	Total
E1	15	15	30
E2	15	15	30
Total	30	30	60

Validation of Instrument

A Biology Achievement Test [BAT] was developed by the researchers. The instrument was face validated by experts in biology and measurement and evaluation in University of Nigeria, Nsukka. The subjects were asked five easy questions based on the content of lesson. They were expected to answer all the questions.

Experimental Procedures

Each experimental group received lessons for one hour fifteen minutes per week for six weeks. The same learning contents [pollution, conservation of resources and organic evolution] were taught to the experimental groups same day. The experimental group A was taught using audio recordings of the learning contents while experimental group B was taught with video recordings of same learning contents. The two groups were given the same post test immediately after the treatment.

Results

Research Questions 1 and 2

What are the effects of video taped and audio-taped instructions on the students' achievement in biology?

Table II: Comparison of the Mean Scores of Students Taught Video- Taped and Audio-Taped Instructions

Media	Boy X	Girl X	Grand X
Video-taped Instruction	17.00	10.03	13.65

Audio-taped Instruction	8.03	11.00	9.51
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Table 11, shows, the mean score of students taught with video-taped and audio-taped instructions .From the table it can be observed that students who received lesson using video-tape has a mean of 13.65 while those taught audio- tape has a mean of 9.51.Boys performed better [17.00] than girls [10.03] when taught video-tape while girls did better [11.00] than boys [8.03] when taught with audio-tape.

Hypothesis

There is no significant difference between the scores of students taught biology with video and audio-taped instructions as a result of gender.

Table III: Analysis of Variance of Students' Achievement by

Treatment and Gender

Source of Variation	Sum of Squares	D/F	Mean	F	Dec
Main Effect	548.20	1	46.27		
Status	548.20	1	46.27	0.36	S
Explained	548.20	1	46.27		
Residual	13563.81	59			

As shown in Table 111, there is significant difference in the mean achievement of students taught with video-tape and audio-tape instructions at 0.36 level of confidence. This implied that at 0.05 level of confidence at which the hypothesis was formulated it is significant, therefore, the null hypothesis is rejected. It follows that significant difference exists between the achievement of boys and girls taught biology with video-tape and audio-tape instructions.

Discussion

This study has shown that students taught with video-tape do significantly better than those taught with audio-tape instructions. Table II, shows this. Data presented on this Table indicated that students taught with video-tape instructions has a mean of 27.03 while those taught with audio-tape has a mean of 19.30.These findings are in line with the works of Amuneke, 1988, Babayemi,1991, and Ashola, 1996.These studies consistently reported that video media especially video-tapes increases comprehension, attention and retention.

It has been observed that boys did better than girls when taught with video-tape instructions. On the other hand, girls performed better than boys when exposed to audio-taped instructions. This is shown in table 1 .The study has indicated that there is significant difference in the performance of male and female students taught with video and audio tape instructions. This is shown in table III. This finding is in agreement with the works of Howard [1978J and Bates [1990].These researchers both found that males do better than in video-tape instruction than females while females perform higher than males when exposed to audio-tape instruction. This implied that for improved performance teachers of biology should employ video-tape instruction and audio-tape instruction for teaching male and female students respectively.

Recommendations

The following recommendations are made based on the research findings:

- 1) Since video-tape and audio-tape instructions have been found to be suitable in learning of biology, teachers should be encouraged to employ these two methods in teaching the subject.
- 2) Teachers should be re-trained to possess the necessary competences in designing, production and use of video and audio-tape instructions.
- 3) Government should equip schools with necessary instructional materials for effective teaching and learning in secondary schools.

Conclusion

Biology is the most popular among the science subjects. Every student including arts inclined offer it in Senior Secondary School Certificate Examination [SSCE]. To many this study of life [Biology] is the only science subject to be ever studied in life time. This therefore, calls for appropriate methods and media to be employed by the teacher to ensure a better comprehension and retention. As has been proved by this study the use of video and audio-tape instructions can improve the teaching and learning of biology.

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