

# Effects of Video Instructional Package on Interest of Secondary School Biology Students in North Central, Nigeria

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## Abstract

*This study investigated the effect of interactive video instructional package on students' interest in mammalian skeletal, osmosis and diffusion in Biology. The influence of gender on SS1 in biology class was also examined. Quasi-experimental design, specifically the pretest, posttest nonequivalent control group design was used. Purposive sampling technique was used in choosing the four schools that comprised sample size of 169 students. Two intact classes were used and each was assigned as experimental group and the other as control group. The control group was taught using lecture method while the experimental group was taught using video instructional package. The experimental group comprises of 86 students and the control group comprised of 83 students made up of 85 males and 84 females. Student Interest inventory on Biology (SINIOB) was used to collect data. The coefficient of 0.87 was obtained for SINIOB using Cronbach alpha formula. Two research questions formulated by the researcher were answered using mean and standard deviation while Analysis of Covariance (ANCOVA) was used to test two hypotheses formulated at 0.05 level of significance. The findings of the study revealed that the use of video instructional package is an effective means for teaching and learning Biology topics taught SS1 students in Suleja, Niger State. The students exposed to video instructional package showed more interest than those exposed to lecture method.*

**Keywords:** Video instructional package, Instruction material, Video, Interest

## Introduction

Video instructional package is that aspect of multimedia that the student will be solely participating in the learning (Gambari & Gana, 2005). Video package can be defined as an instructional teaching material which offers to the learner privilege to manipulate, control and study at a close pace until the learning is achieved. It also makes the difficult part of teaching and learning of most topics to seem easy to the teacher. Video instructional package, when used as a teaching strategy in Biology makes the practical side of Biology to be a work over job since students must have been conversant with what the topic to be practicalise is all about. It also brings home the practical topics of biological science on the close observational aspect, making the teaching and learning of Biology to be more of student-centered. Video instructional package is a model designed to evaluate every aspect of steps used in cognitive and psychomotor teaching and learning for proper effectiveness. The evaluation brings the teacher closer to the student individually as he/she assesses herself/himself from student's acceptance of the teaching and learning strategy (Beshnizen and Van Puthen, 2000). The evaluation generates the mind in the teachers to accept criticisms from the learners and sees it as a means of developing the student better. This teaching strategy makes every student wants to participate in the learning thereby increasing learning interest, desire, attention and curiosity. The concept "Curiosity" is the bases for successful performance as it develops the student to be inquiry, more close to the subject and the topics more than the teacher. The student asks more questions and demands an answer as he/she likes the subjects. It makes the student to research and be innovative on his/her own. If education is to build a child in all areas of life to be able to face challenges of similar problem, then the use of technical know-how of interactive video instruction package as a teaching material which active participation of the student is absolutely needed. Then evaluation of the programmed teaching strategy must be done by the teacher and the objective of the learning stressed in other not to lose the Key Point which is the focus.

Video instructional package assists the teacher to prepare themselves alongside with the subject topic to deliver. In the classroom the teacher focuses in bringing out the best in the student through the teaching, portraying the best competency and skill during the hour of learning and impacting innovating, inquiring, and interest in the students. As teaching and learning in the classroom continues, students react to the changes by performing tasks that empowers them to learn and have their learning evaluated at the end. Video instructional package application in the classroom indicated that instructors are to evaluate the package to be used for their teaching, extensively demonstrate the teaching properly, then the exercise could be helpful for higher achievement and interest in students (David, Michael & Craig, 2008). Evaluated package before its usage is also act of preparation of the teacher ahead before the class teaching proper. In the classroom, the teacher introduces the instructional package to be used which aids the teacher to continue or improve better while delivering the subject topic. The second step follows suit if the reaction of the students improve positively, indicating their preparedness to grab what the teacher will teach. Teaching with video instructional package that has qualitative and quantitative base on curriculum provides student with educational interest when it is not as a mere computer game both at school and home.

Gana,(2013) stated that the administrators and teachers need to make educational technology an integral part of teaching and learning to provide a clear demonstration of how best to use instructional technology tools to address the personal and general concern of teaching and learning in Nigeria. Ajagun, (2003) generalized ICTs as a whole range of technologies involving the information processing and electronic communication. This covers radios, televisions, videos, computers, interface boxes, e-mail, satellite connections, internet and all communication software. Gana,(2013) emphasized that educational technology should influence educational outcomes and costs. This is because if a teacher is good with technology operation, the teacher can select appropriate educational technology for teaching, can prepare some of the interactive video instructional packages to be used for the teaching and the learning, as well as be able to proof read a ready-made purchased interactive video package to be used as teaching material. This makes student learning to be optimized yielding increase in the value of skill acquisition, interest attitude and behavioural change. Gana, (2013) identified that within the educational content, these objectives becomes relevant and increase in shift down productivity.

Interest connotes an important variable in educational field because it is bedrock of positive performance. Interest can be a subjective feeling of concentration or curiosity over something. It is the preference for particular types of activities, that is, tendency to seek out and participate in certain activities (Agwagah, 1993). Relating these definitions to this study, interest is the motivation of student to like mammalian skeleton, osmosis and diffusion topics in Biology through the use of video instructional package in teaching and learning process. When students' lack interest in topic of a subject, it makes them to perform less in such subject thereby creating loss of interest in learning of such subject course. Therefore, Student's interest in learning might largely depends on the use of video instructional package for a better teaching and learning atmosphere. It has been found that evaluation brings out the best in learners as adequate and proper learning is achieved. It generates the qualitative part of the teacher which only this evaluation can produce learning interest and desire. Fatunmbi (2005) stated that studies have shown that there is improvement in teaching and learning process through the use of video. According to him, video can be used to provide real experiences in almost all field of learning. It can be made to repeat information and demonstration as many times as possible, thereby, learning is made easier, realistic and concrete for learners. It provides self-instruction, cheap and fast way of disseminating educational information and practical skills.

### **Aim of the Study**

The main aim of this study is to determine the effect of video instructional package in the improvement of student's academic achievement and interest, as well as bridging of gender inequalities in learning of Biology in senior secondary schools in Suleja, Niger State.

### **Objectives of the Study**

The objectives are specifically to:

1. Find out the effect of video instructional package on the interest of senior secondary school students' in Biology and those exposed to lecture method.
2. Determine the interest of male and female students exposed to video instructional package for teaching Biology in secondary schools in Suleja.

### Area of the Study

The study covered the following senior secondary school owned by government in Suleja Local Government Area of Niger State (Government Day Secondary Schools, Madalla; Community secondary school, Barracks; Government Secondary School and Government Girl's Day Secondary School). The students involved are senior secondary school Biology students of class level one (SS 1) of four government schools purposively selected in Suleja Local Government Area of Niger State. The schools selected were divided into two, two were used as experimental groups (treatment group) and the other two used as control groups (non-treatment group).

### Methodology

**Research Design:** A survey design was used to collect data for the analysis, Precisely pre-interest, post-interest, control group design of research on interest inventory SINIOB. This research design was prepared on four likert scale on which students' interest were analysed. Intact classes were used since it is natural to use an already existing classroom in a school instead of creating a new classroom group through random selection and random assignment of subjects which might introduce extraneous variable known as experimental bias (Sambo, 2008). The dependent variable is the interest of the students while the independent variable is the video instructional package (the teaching method). The moderator variable is the gender which measurements were taken at two levels of male and female.

**Population of the Study:** The target population for the study was all the Biology students in senior secondary schools in Suleja Local Government Area of Niger State. There were at the time of study, twenty-eight (28) government secondary schools in Suleja local Government Area, in Niger State, out of which four (4) schools were selected from the government school by purposive sampling technique. The total number of the population of students for the study was 35,659 comprising of 13 single sex schools and 15 co-educational schools. The sample size of students used for this research was made up of one hundred and sixty-nine (169) students from four (4) public (state government owned) secondary schools. The study adopted the use of intact class approach where all the students in each class were involved in the teaching and the testing sessions. The total numbers of the girls were eighty-four (84) and the total numbers of the boys were eight-five (85). Co-educational and single schools were used so as to properly determine gender differences in students' learning of Biology using video instructional package. Two schools of total number of 86 were used as experimental group (by administering the treatment of using the video instructional package) and the other two schools of total of 83 were used for control group (by teaching the group using only lecture method). Separate school was used for pilot test to test reliability. A single stream of intact classes was selected randomly from the sampled schools and used for the study. The stream (Arm) of each school was assigned as experimental group and control group. The total sample size for the study was 86 students for the experimental and 83 students for the control, given the total number of 169.

**The Research Instruments:** The test instrument used for this study was on student's interest and the questionnaire was administered before the treatment as pre-interest and after the treatment as post-interest both to experimental and control groups on the eighth (8<sup>th</sup>) week. The Student Interest Inventory on Biology (SINIOB) determined the level of students' interest on the concept taught. The test instrument (SINIOB) was constructed by the researcher on twenty-five items using 4 points likert scale. The choice of this likert scale over others is that it was regarded as one of the best and simplest form to follow (James, 2000). The scoring of the items was for positive response (Strongly Agree 4, Agree 3, Disagree 2 and Strongly Disagree 1) while for negative response was strongly Agree 1, Agree 2, Disagree 3 and Strongly Disagree 4. Therefore, total of positive response of strongly agree and negative response of strongly disagree on the 25 items questionnaire was scored, which was converted to quantitative data and used in the analysis.

**Procedure for the Development of Learning Package:** Video Instructional Package was the instrument

used in teaching the experimental group, it was developed by the researcher and a programmer. The idea of the researcher to make the instructional package is based on the fact that; (i) the commercially produced package might not have passed through evaluation using Biology curriculum which, (ii) When they are available, they may not be having relevant objectives needed to be achieved by the researcher, (iii) the language used by the programmer was evaluated to make sure that it is simple and easily understandable by the students at their level. As a result of this, developing instructional packages for use by the researcher becomes inevitably necessary. The instructional package consists of the same topics and was burnt in a CD ROM and presented to the client computer with input device on the computers, whereby the learners respond to the computer prompts. The video presents information and display the topics with some explanations to the learners on each of the concepts, after which the students attempted some multiple choice objective questions. Each of the topic was presented by the video on interactive instructional mode, that is, exposure to information, facts and practice on the topic and immediate response or feedback to the question applicable.

### Validity of Test Instrument

The Student Interest Inventory on Biology (SINIOB) of four point likert scale containing twenty-five (25) questions, multiple choice item on Biology Achievement Test (BAT) and the marking scheme were validated by two lecturers in the Department of Science Educational Technology biological science of Federal University of Technology, Minna

**Reliability of the Instrument:** A trial testing was conducted using forty (40) SS1 Biology students from another co-educational school beside the four sample schools used for the study. This was to ascertain the general suitability of the instrument. The data obtained from the trial testing were used to find the internal consistency. The test items of SINIOB was analysed and reliability coefficient of 0.97 was obtained from Cronbach's Alpha for the interest inventory.

**Method of Data Analysis:** Both the pre-interest and post-interest data collected for interest from the study were subjected to statistical analyses using means, standard deviations, and ANCOVA. The SPSS version 16.0 window was used in the analysis. This constituted necessary test for the two hypotheses of the study and the results obtained were used to answer the research questions and test the hypotheses at 0.05 level of significant.

### Research Questions

To guide this study, answers were sought to the following research questions:

1. What is the mean interest scores of secondary students exposed to video instructional package and those exposed to lecture method?
2. What is the mean interest scores of male and female students' exposed to video instructional package?

### Research Hypotheses

The following Null research hypotheses were formulated and tested at  $p < 0.05$  level of significance.

**HO<sub>1</sub>:** There is no significant difference in the mean interest scores of Biology secondary students exposed to video instructional package and those exposed to lecture method.

**HO<sub>2</sub>:** There is no significant difference in the mean interest scores of male and female Biology students' exposed to video instructional package.

### Results of Data Analysis

Data collected for this study was analysed for the questions and the hypotheses

### Research Question 1

What is the difference in the mean interest scores of biology secondary students exposed to video instructional package and those exposed to lecture method?

**Table 1: Mean Interest and Standard Deviation of Biology Secondary Students Exposed to Video Instructional Package and those Exposed to Lecture Method**

| Groups       | N  | Pre-Interest |       | Post-Interest |       | Mean Gain |
|--------------|----|--------------|-------|---------------|-------|-----------|
|              |    | Mean         | SD    | Mean          | SD    |           |
| Experimental | 86 | 48.30        | 2.727 | 88.64         | 3.914 |           |
| Control      | 83 | 47.75        | 2.836 | 58.86         | 3.108 | 29.78     |

Table 1 shows the mean interest scores for the experimental and control groups. From the result, the experimental group had the mean interest of 48.30 in the pre-interest and 88.64 in the post-interest and the control group had 47.75 in the pre-interest and 58.86 in the post-interest. This result of the mean interest of 88.64 for the post-interest of the experimental group and 58.86 for the post-interest of the control group produced 29.78 ( $88.64 - 58.86 = 29.78$ ) indicates that students in the experimental group shows much interest in Biology subject when taught with video instructional package than students in control group.

### Research Question 2

What is the difference in the mean interest scores of male and female students' exposed to video instructional package for teaching Biology?

**Table 2: Mean and Standard Deviations Scores of the Interest Scores of Male and Female Students' Exposed to Video Instructional Package for Teaching Biology**

| Groups       | Sex    | N  | Pre- Interest |       | Post-Interest |       | Mean Gain |
|--------------|--------|----|---------------|-------|---------------|-------|-----------|
|              |        |    | Mean          | SD    | Mean          | SD    |           |
| Experimental | Male   | 41 | 48.39         | 2.626 | 87.71         | 4.314 |           |
|              | Female | 45 | 48.22         | 2.844 | 89.49         | 3.335 | 1.78      |

Table 2 shows the mean interest scores of male and female students taught mammalian skeleton, osmosis and diffusion in biology using video instructional package shows the mean interest scores of male and female students taught mammalian skeleton, osmosis and diffusion in Biology using video instructional package. The males in the experimental group had mean interest score of 48.39 in the pre-interest and 87.71 in the post-interest making the mean interest gain of the male students in the experimental to be 39.32. Similarly, the female in the experimental group had mean interest score of 48.22 in the pretest and 89.49 in the post-test making the mean interest scores of the female students in experimental group to be 41.27.

This result of the mean interest gain difference of 89.49 for the post-interest of the female and 87.71 for the post-interest of the male produced 1.78 ( $89.49 - 87.71 = 1.78$ ) indicates slight differences in the mean interest between the male and the female students exposed to video instructional package.

**H<sub>01</sub>:** There is no significant difference in the mean interest scores of Biology secondary students exposed to video instructional package and those exposed to lecture method.

**Table 3: ANCOVA Result of the Mean Interest Scores in Student Interest Inventory on Biology (SINIOB) of Experimental and Control Groups**

| Source          | Type III of Squares | df  | Mean Squares | F       | Sig. | Result |
|-----------------|---------------------|-----|--------------|---------|------|--------|
| Corrected Model | 83488.647           | 2   | 41744.324    | 167.100 | .000 |        |
| Intercept       | 25169.002           | 1   | 25169.002    | 1.008   | .000 |        |
| Pretest         | 22.094              | 1   | 22.094       | 0.884   | .348 | NS     |
| Treatment       | 77685.488           | 1   | 77685.488    | 3.110   | .000 | S      |
| Error           | 4146.832            | 166 | 24.981       |         |      |        |
| Total           | 970368.000          | 169 |              |         |      |        |
| Corrected Total | 87635.479           | 168 |              |         |      |        |

Table 3 showed that the key influence treatment of interest of students exposed (Experimental group) and those that was not exposed (Control group) to video instructional package. The result produced F (df = 1.169) 3.110 and this value is significant at 0.000. The value of F is equally significant at 0.000. The value of F is equally significant at 0.05. That is (p= 0.000; p< 0.05). The treatment by means of video instructional package produced significant differences on interest; hence the hypothesis which states that there is absence of significant dissimilarity in the mean interest score of the learners in Experimental group and those in Control group was therefore rejected.

**Ho<sub>1</sub>:** There is no significant difference in the mean interest scores of male and female Biology students' exposed video instructional package.

**Table 4: ANCOVA Result of the Mean Interest Scores in Student Interest Inventory on Biology (SINIOB) of Male and Female in Experimental Groups**

| Source          | Type III of Squares | df | Mean Squares | F       | Sig. | Result |
|-----------------|---------------------|----|--------------|---------|------|--------|
| Corrected Model | 77.532              | 2  | 38.766       | 2.628   | .078 |        |
| Intercept       | 2409.459            | 1  | 2409.459     | 163.347 | .000 |        |
| Pretest         | 9.439               | 1  | 9.439        | .640    | .426 | NS     |
| Gender          | 66.468              | 1  | 66.468       | 4.506   | .037 | NS     |
| Error           | 1224.294            | 83 | 14.751       |         |      |        |
| Total           | 677001.000          | 86 |              |         |      |        |
| Corrected Total | 1301.826            | 85 |              |         |      |        |

Table 4 indicates that the key influence treatment on the interest marks of male and female learners' open to video instructional platform produced F (df = 1.86) 4.506 and this value is not significant at 0.05 level. As the value of F is higher than that of the alpha set at p< 0.05, the null proposition of insignificant dissimilarity in the mean interest scores of male and female students exposed (Experimental group) to video instructional package is hereby rejected.

### Conclusion

The resulting inferences were made on the basis of the discoveries from this investigation provided a practical proof that the usage of video instructional package enhances students' interest in mammalian skeleton, osmosis and diffusion in Biology better than the use of lecture method.

Secondly, there was absence of significant difference between the mean interest scores of the male and female learners that were educated mammalian skeleton, osmosis and diffusion in Biology with video instructional package. This applies that gender never have significant impact on the performance and interest tests. Generally, the use of video instructional package has proved to be viable in stimulating and enhancing effective teaching and learning of mammalian skeleton, osmosis and diffusion.

### Recommendations

The following references were made based on the findings of this investigation.

1. Since the application of video instructional package enhances achievement and interest in mammalian skeleton, osmosis and diffusion in Biology lesson, the Biology teachers should adopt it as one among various the approaches to be engaged in classroom.
2. Workshops and seminars ought to be organized by Federal and State ministries of education for Biology teachers to enable them learn how to develop software packages and also learn how to use video instructional package in teaching Biology especially in mammalian skeleton, osmosis, diffusion and other topics in Biology.
3. osmosis and diffusion in Biology. These textbook authors should work with the programmers as to add video instructional package principles in the evaluation and assessment in their written books as well attachment of CDs.
4. Parents and guardian should equally be encouraged to buy computers for their wards to make practice of at home after normal lessons in order to assist the students to run-through what they have been taught at home, thereby, discouraging them from engaging in unnecessary ventures after school hours.
5. Textbook authors have a duty to change emphasis from tutor-focused to learners' focused events that will uphold learning through undertaking such with the use of video instructional packages in the teachers' guide or teachers' manual.

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