# Effects of Computer Animation Package on Senior Secondary School Students' Academic Achievement in Geography in Ondo State, Nigeria.

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**Abstract:** This study examined the effect of computer animation package on senior secondary school students' academic achievement in Geography in Ondo State. Gender difference in the achievement of students taught with computer animation package was also examined. The quasi-experiment pretest-posttest experimental control group research design was employed. A sample of eighty (80) students selected using purposive sampling technique participated in the study. The researcher developed and validated an achievement test which was the main instrument used for data collection. The t-test statistics was used for data analysis. The result of the findings revealed the students exposed to the teaching of Geography using computer animation package performed better than those taught Geography without the package. Also the findings also revealed that gender has no significanct effect on the academic achievement when taught Geography with computer animation package. The implications of the study were also discussed.

**Keywords:** Computer, Animation Package, Ondo State, Geography Teaching

## 1. INTRODUCTION

Geography as a school subject has the potential to influence the intellectual development and personal growth of youths. Its significance in the school curriculum cannot be over emphasized (Aderogba, 2011). The subject combines with many school subjects – Arts, Social Science, Pure Science, Mathematical, Sciences, Language and Technical Education in Nigeria, to make a child qualify for tertiary education in or outside the country. Similarly, it has led to the development of professionals in various fields of human endeavour- Planning, Administration, Academics, Catographic, Hydrologic, Climate environment and others just to mention a few (Abidoye and Ogunniyi, 2012). In addition, as Abegunde (1988) asserts, Geography as a school subject promotes career opportunities and nation building.

Teachers play a vital role in the implementation of the curriculum; their responsibility is to ensure that Geography students attain natural goals incidentally, especially the learners who have peculiar characteristics that may manifest special learning needs (Abidoye and Ogunniyi, 2012). Learners usually expect that the materials and methods of instruction should be easily transferable to the real world. The task of the teacher, thus, includes, among others, providing materials and experiences to aid learning and meet the learner's expectations (Osokoya, 2007). Basically, learning from animation makes the audio-visual and synchronized system a tutor. Owolabi and Oginni (2014) emphasized the use of computers for education purposes, which have become increasingly common. The application of dynamic visualization such as animation is potentially well suited for learning contents and is not easily affordable in classroom settings. Such teaching can be made real through multimedia in such a way that instruction would be simplified and appreciated (Owolabi and Oginni, 2014).

The volume of knowledge is increasing exponentially in the 21st century. Geography teachers teach efficiently when there is a collaboration of methods. However, it would be short sighted to focus only on the traditional way of chalk and talk approach since the world is dynamic in technology. Owolabi and Oginni (2014) assert that higher order thinking is born out of passion for knowledge than the simple recall of facts. It is the function of interaction between synchronized systems and teachers guidance that makes application of computer animation effective.

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Animation is a device that has the feature of both audio and visual presentations that are being used in the teaching/learning process for effective dissemination of knowledge; it involves programs of instruction to be delivered which are recorded in a video tape disc. The method appeals to both the sight and hearing senses of learners thereby fostering the retentive memory and recalling ability of learners. Animation instructional package is able to use information from a figurative point of view (i.e. using an imagery representation rather than a symbolic description of facts) to build internal representation of a phenomenon (Osokoya, 2007). Animation may be described as the rapid succession of pictures indicating a series of slides, appearance and disappearance of iconic elements continually.

Despite innovation in Geography teaching, Aderogba (2011) discovered that the rate at which Geography students complain about the large scope and abstract nature of the subject is at an alarming rate. The complaints are widespread among students and teachers alike. These complaints are accentuated by the assumption that as a subject it is difficult to teach and learn about, and more importantly there are no readily instructional aids and appropriate methods for effective teaching and learning of the subject (Abidoye and Ogunniyi, 2012).

The use of animated materials such as cartoon instruction reduces the learning task and time; it also creates room for consistency and learning mastery by increasing retention, safety and motivation. Learners enjoy interactive learning through cartoon teaching since it is efficient, effective and flexible. It facilitates communication and appeals to senses of sight and hearing at the same time. It provides a concrete basis for the comprehension of abstract concepts and allows for a more meaningful and permanent learning (Owolabi and Oginni, 2014). Animation- based teaching is therefore an effective instructional medium which the teacher can use to deliver learning experiences to Geography Students.
Gender has been identified as one of the factors influencing students' achievement at secondary school level (Abidoye and Oguniyi, 2012). Gender difference disparity in the study of different subjects including Geography, in developing countries, is attributed to socio-cultural and traditional reasons (Wasagu, 2007). Research conducted by Adedoja, Abidoye and Afolabi (2013) found that male and female students performed equally better in Geography using puzzle packages in the teaching of primary school social studies.

Similarly Osodo and Ongati (2010) found no significant difference between male and female students taught Geography using instructional media. However, since studies on the effects of computer animation package on Geography are very scanty, the non-conclusive nature of the influence of gender on students' achievement in Geography calls for further research. It is against this background that this study is proposed, in order to (1) investigate the effects computer animation package has on senior secondary school students' achievement in Geography and (2) explore the influence of gender on student achievement in Geography.

## 2.  RESEARCH HYPOYHESIS

The following research hypotheses were formulated and tested in this study:
1. There is no significant difference between the pre-test scores of students taught with a computer animation package and a conventional teaching method.
2. There is no significant difference in the mean achievement score of students taught Geography using computer animation package and those taught without the package.
3. There is no significant difference in the mean achievement scores of male and female students taught Geography with computer animation package.

## 3.  METHODOLOGY

The research design adopted for this study is the pre-tests, post-test control group quasi-experimental design. The experimental group was taught Geography using computer animation instructional packages while the control was exposed to conventional method of teaching.

### A.    *Population and Sampling Technique*

The population for this study was made up of all senior secondary school II Geography students in Akure South Local Government area of Ondo State. The sample for this research was made up of 80 senior secondary school Geography students randomly selected from four schools using simple random techniques. The selected were based on the following criteria: (a) they are well equipped with computer facilities; (b) they have at least two Geography teachers that are computer literate; and (c) they encourage researchers to use their facilities. Twenty students were randomly selected for the study from each of the four schools. 40 male and 40 female Geography students were randomly selected for the study. Thus the total number was 80 and were assigned into experimental and control groups respectively. 40 students were assigned to experimental and 40 students to control groups. Equal numbers of male and female students were randomly selected to take care of gender differences.

*B.    Research Instrument*

Two instruments were used in this study.
(a)   Geography students Achievement Test (GSAT)
(b)   Computer Animation Instructional Package (CAIP)

GSAT was developed by the researcher and is divided into two sections: section A and section B. Section A consists of personal data of the participants on gender, school, class and local government area. While section B consists of fifty multiple choice items with four options (A-D), out of which only ONE is correct.

The instrument was validated through expert review. Three experienced and seasoned secondary school Geography teachers went through the draft of the instrument. Based on their suggestions, some items were modified while some were completely eliminated. The instrument was further administered to 30 Geography students of the same level in a school not involved in the study to determine its reliability. The reliability coefficient was found using Kuder Rechardson KR21. The reliability of 0.081 was found to be high enough for the instrument to be used.

CAIP – The development of this instrument was jointly developed by the researcher and a computer expert using lesson notes prepared for the traditional chalk-and-talk method. The package was prepared to suit the ability of the learners. The topics covered were selected based on the syllabus of Senior Secondary II Geography students.

The development of courseware for the research materials follow the systematic and recursive approach of instructional development model put forth by Dick and Carey (1996). The instrument was also administered in another school not part of the selected schools for the study. Some of the complaints from the students of this school about the package were later used for further modification and development of the package. The computer animation instructional package (CAIP) was validated by two experts from Educational Technology science departments, Adeyemi College of Education Ondo and Senior lecturers who are experts in the field of Geography at the same college.

*C.    Procedures for Data Collection*

The data for testing the hypothesis was collected from the pretest and posttest administered to the participants in the study. Each of the tests was marked and scored – the teaching was done for six weeks with the control group being taught through the use of traditional methods of teaching. The teaching was done for the period of six weeks with three lessons per week.

## 4.    RESULTS

The data collected for this study were analyzed using the mean, standard deviation and t-test.

**Hypothesis 1:** There is no significant difference between the pretest score of students taught with the computer animation package and their counterparts exposed to conventional methods.

**Table 1: T-test comparism of the pre-test mean scores of the experimental and control groups.**

| Variables | N | Mean (x) | SD | df | T-cal | T-critical |
|---|---|---|---|---|---|---|
| Experimental Group | 40 | 77.30 | 6.52 | 39 | 1.654 | 1.92 |
| Control Group | 40 | 71.56 | 6.07 | | | |

Table 1 shows that t-calculated (1.654) is less than t-table (1.92), (N = 80, X (72.30, 71.56, 70.56), SD 6.52, 6.07) at 0.05 level of significance. Hence the null hypothesis is therefore upheld. This implies that students in the experimental and groups were at the same entry level with regard to academic ability before the treatment.

**Hypothesis 2:** There is no significant difference in the mean achievement score of students taught Geography using computer animation package and those taught without the package.

**Table 2: Showing t-test of the post-test of experimental and control groups.**

| Variables | N | Mean (x) | SD | df | T-cal | T-critical |
|---|---|---|---|---|---|---|
| Experimental Group | 40 | 84.52 | 3.75 | 39 | 1.673 | 0.326 |
| Control Group | 40 | 81.61 | 9.56 | | | |

t-calculated > t-critical, P < 0.05. HQ is rejected.

The above result indicates that there was significance in the post-test, mean scores of Geography students taught with computer animation package (X = 84.52) and their counterparts exposed to conventional teaching method (X = 81.61). Also the t-calculated (1.673) is greater than the t-critical (0.326). Therefore the hypothesis which states that there is no significant difference in the mean achievement score of students taught Geography using computer animation package and those taught without the package is rejected.

**Hypothesis 3:** There is no significant difference in the mean achievement score of male and female student taught Geography with computer animation package.

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**Table 3: T-test comparism of post-test mean scores of male and female students in the experimental group.**

| Variables | N | Mean (x) | SD | df | T-cal | T-critical | Sig |
|-----------|---|----------|-----|-----|-------|------------|-----|
| Male | 20 | 50.4 | 4.1 | 19 | 1.45 | 1.92 | Sig |
| Female | 20 | 52.3 | 4.2 | | | | |

Significant at P < 0.05

From table 3 above, the t – calculated value of 1.43 is less than the critical value of 1.95. Therefore the hypothesis which states that there is no significant difference in the mean achievement score of male and female Geography students taught with computer animation package is hereby accepted.

## 5.    DISCUSSION OF FINDINGS

The results of the analysis of the t-test on the performance of students taught Geography using computer animation package and those exposed to conventional teaching methods indicated a significant difference in favor of the students in the experimental groups. The results reveal that students taught with a computer animation package performed better than those exposed to conventional teaching methods. These results are in agreement with the studies of Abidoye and Ogunniyi (2012), Egunjobi (2002) and Aderogba (2012) which focus directly on Geography. They however contradict the conclusion of Ramarrchandram and Scotter (2013) who found no significant difference between the control group and experimental group on a meta-cognitive instructional based strategy in Algebra.

Also gender had no significant effects on the use of computer animation package in the teaching and learning of Geography in secondary schools. The study negates the findings of Abimbade and Egunjobi (2003), who were of the opinion that male students are more computer inclined than their female counterparts. It corroborates the findings of Abidoye and Ogunniyi (2012) that gender has influence on the use of instructional materials in the teaching of Geography in Secondary schools. This therefore implies that gender as a variable has an impact on academic achievement of students in school subjects especially Geography.

## 6.    CONCLUSION AND RECOMMENDATION

This study has provided empirical findings to support the efficiency of computer animation packages in the teaching and learning of Geography in secondary schools. Based on the findings of this study, the following recommendations are made:

i. It is recommended that the use of computer animation package must be given adequate priority in our school system and other similar systems internationally.

ii. Conducive environments should be provided with adequate facilities for effective use of computer animation package in schools.

iii. There is a need for Geography teachers to update themselves through seminars, conferences, and workshops that will enhance their teaching of Geography.

iv. Concerted efforts are required on the part of the Ministry of Education to provide schools with enough funding for the purchase of necessary materials and the equipping of ICT facilities for use of computer animation packages.

## 7.    LIMITATION OF THE STUDY

The following limitations can be observed regarding this study; first, the study was designed to focus on learning of Geography by senior secondary students drawn from four public Nigerian secondary schools. The findings, thus, may not be generalizable to other public and private institutions. Second, the study did not examine other alternative means like internet, video etc. for delivering the course contents. Despite these limitations, however, the findings are significant, particularly for the use of computer animation packages in the Nigerian school system. In addition, this study is also relevant to international communities just as it is to Nigeria because it exposes both students and teachers worldwide to the designing and use of computer animation packages as a means of instructional delivery in the school system.

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