

Effects of Computer – Assisted Instruction on Achievement, of Junior Secondary School Students in Social Studies in Niger State, Nigeria

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Abstract

This study determined the effects of computer assisted instructional mode on achievement level of Junior Secondary School Students in social studies. Three research questions were raised and three null hypotheses were tested at 0.05 alpha level. The study adopted the pretest – posttest experimental – control group design. A sample of two hundred and forty (240) students were drawn from six Junior Secondary Schools in seven educational zones of Niger State. The zones are located within the three senatorial zones in the state. Purposive sampling technique was used to select six co-educational schools for the research. The researcher developed computer assisted instructional package on social studies which was used as treatment instrument for the experimental group while the control group was exposed to conventional lecture method. The instruments for data collection were Social Studies Achievement Test (SOSAT). A forty item multiple – choice objective type questions were used for the SOSAT. A reliability coefficient of 0.95 and 0.95 were obtained for the instruments using split-half method. For instance, the result of hypothesis one indicated that there was statistically significant difference in the achievement of students taught Social Studies using Computer Assisted Instructional mode and those taught with conventional lecture method. While hypothesis four showed that there was no significant difference in the achievement scores of male and female students taught Social Studies with Computer

Assisted Instructional mode. It was recommended among others that, for effective teaching and learning in Junior Secondary Schools in Niger State and the country at large, government should as a matter of urgency supply government schools with all the necessary instructional media such as Computer assisted instructional mode on social studies (CAIMOSOS) in order to enhance effective teaching and learning of Social Studies.

Introduction

In Nigeria, the different levels of students' achievement are sources of worry and constitute areas of interest to educators and educational researchers, government and education stakeholders. This is as a result of the importance of education to national development. There is consensus among experts that the educational standard is fallen drastically (Adebule, 2004; Yusuf, 2005, Okebukola, 2006; Ahmed, 2010). Despite all efforts put in place for teaching Social Studies at the Junior School level, the performance of students in recent years has been quite unsatisfactory. Social Studies educators such as Mezieobi and Joof (2000) and Okam (2000) have asserted that in spite of the important place of Social Studies in Nigerian educational system, the aims for which the subject is set have not been achieved. Students continue to perform poorly at the Junior Secondary Certificate Examination. Awoyemi (1986) and Linda (2000) were of the opinion that teachers' incompetence in the ever-changing curriculum, which makes them to operate almost at the same level with their students, is a contributing factor for the poor performance of students in Social Studies. Mezieobi and Joof (2000) attributed the dismal performance to the use of inappropriate approach by the teachers in teaching the subject in Nigeria. Some of the causes of these dismal performances were identified to include: motivational orientation, self-esteem/self-efficacy, emotional problems, study habits, teacher consultation and poor interpersonal relationships (Aremu and Sokan, 2003). In addition, there were also the challenges of poor learning environment, lack of

adequate instructional materials, over crowding in the classroom and poor method of teaching. There' were also parental factors and wrong peer group interaction, teachers poor attitude to their job as reflected in their incompetence, lack of interest in the job, inadequate utilization of instructional materials, going to school late and uncomplimentary comments about students' performance that is capable of lowering students morale (Asikhia, 2010). Linda (2000) also observed that the quality of teachers influences the students' performance. The natural capacity of students to learn on their own has not been adequately enhanced in most conventional classrooms in Nigeria where traditional lecture method is the order of the day (Fajola, 2000; Ogunranti and Okebukola, 2005).

This problem is often caused by too much theoretical expression by the teachers while learners are passive listeners; consequently, students memorises and regurgitate facts and concepts. Yusuf, (2005) attributed the low performance in public examination, to the use of verbal instruction which seems to be the easiest form of instructional strategies in place of the traditional ones. Based on these facts, Gana, (2005) suggested the need for massive use of instructional media in the classroom. Green (2000) claims that if teachers capitalized on the capabilities of media, they can easily promote the learners' perceptions, understanding and transcends the learning of computer and at the same time it provides a link between an object and its orthography. However, most teachers of Social Studies in the Nigerian Junior Schools depended largely on the use of traditional method of teaching, which does not in any way enhance effective teaching and learning. Ogunyemi, (2001) reported that in the era of technological advancement, technology has minimum impact on education and that the reason is 80% of teachers in Nigeria are mostly using the talk and chalk (traditional method) in teaching. In addition, most schools have no modern equipment and materials, while some have the equipment but no stable power supply. This is coupled with the inability of some teachers to operate and manage the equipment.

Statement of Problem

It is important to note that despite all efforts put in place to teach Social Studies among Junior Secondary School students, the performance of students has been unsatisfactory over the years. Aremu and Sokan (2003) pointed out that there are challenges of poor learning environment, lack of adequate instructional materials, over crowding in the classroom and poor method of teaching, etc. Governments' lip-service to funding and in making provision of teaching materials; absence of well-equipped computer centers for use; and the resistance by some teachers to adopt modern teaching techniques are also contributing factors to poor performance of students in Social Studies.

Some of these poor performances in Social Studies at the JSS NECO examinations in Niger State showed the percentage credit levels (A1- C6) rates at 20.58% in 2006, 20.51% in 2007, 32.73% in 2008, 36.67% in 2009, 41.65% in 2010 and 42.28% in 2011 respectively. All these are evidences of poor achievement. It was on this basis that this research investigated the effectiveness of Computer Assisted Instructional modes on achievement level of JSS Social Studies students.

Purpose of the study

1. To determine the difference in achievement among Junior Secondary School students taught Social Studies with Computer Assisted Instructional mode and those taught with conventional lecture method
2. To determine the difference in achievement between male and female students taught Social Studies with Computer Assisted Instructional mode.

Hypotheses

The following null hypotheses were formulated and tested at 0.05 significant level:

H₀: There is no significant difference in achievement among Junior Secondary School students taught Social Studies

with Computer Assisted Instructional mode and those taught with conventional lecture method.

Ho: There is no significant difference in achievement between male and female students taught Social Studies with Computer Assisted Instructional mode.

Methodology

Research design

The research design adopted for this research is a randomized Pretest-Posttest group design. It is an experimental research design which seeks to establish cause-effect relationship between two or more variables. An experiment is the set of activities that makes it possible to observe effects of the dependent variables (Male and Female students) on the independent variable (CAIMOSOS) (Sambo, 2005). The subjects (Students) were assigned to experimental and control groups by random sampling method through what is called hat-draw technique. This technique involves squeezing marked and unmarked pieces of papers put in a hat for the students to pick. After picking, the students opened and joined the respective group, those that were marked as experimental group and those unmarked as control group.

Population of the Study

A population is the set of all elements, objects, or events that are of interest for a particular study (Sambo, 2005). The population is also the group of interest to the researcher, the group to whom the researcher would like to generalize the result of the research (Fraenkel and Wallen, 2000. P. 97).

The population of schools for this research was all the two hundred and twenty-four (230) Junior Secondary Schools (JSS) in Niger State (See Appendix VI). These schools have JSS class III student's population of 191,699 which constitute the population for this research. Twenty male and female students were selected from each of the six co-education JSS selected. These categories of students could be more proficient with computer operation because they have been exposed to basic computer operation during their classes I and II.

Sample and Sampling Techniques

A sample is a subset of a population from which data for a study is collected (Fraenkel and Wallen, 2000). For the purpose of this research, six co-education Junior Secondary Schools were sampled. These schools were purposively selected and assigned as experimental and control schools. Three schools that have computer laboratories were sampled as experimental schools. The remaining three schools were taken to serve as control schools. The schools sampled were on the basis of delineation of schools according to the seven educational zones in Niger State. These educational zones are spread across the three Senatorial districts (zones) in the State. Senatorial Zone A comprised of two educational zones of Bida and Kutigi. Senatorial Zone B comprised of two educational Zones of Minna and Suleja while Senatorial Zone C comprised of three educational zones of Kontagora, Rijau and New Bussa. In each Senatorial zone, two Junior Secondary Schools were purposively sampled and used as experimental and control schools respectively.

Fourty (40) students were sampled from each of the six schools that were selected for the research. For this purpose, male and female students were grouped separately for sampling, twenty (20) male and twenty (20) female were selected randomly in each of the schools through a hat-draw method. The sample of subjects (students) for this research was 240 Junior Secondary School class three (JSS111) students offering Social Studies in Niger State.

Instrumentation

For the purpose of this research, two types of treatment instruments were designed and used for data collection. They are:

1. Computer Assisted Instructional Mode on Social Studies (CAIMOSOS) which was the treatment instrument for the experimental group.
2. Social Studies Achievement Test (SOSAT) for posttest and

Methods of Data Analysis

The raw data obtained from pretests and posttests scores were used to test the three null hypotheses using Analysis of Covariance (ANCOVA) statistic as a result of the significant difference found between experimental and control groups on pretest. Computer Statistical Package for the Social Science (SPSS) version 16.0 was used to analyse the data at 0.05 significant levels. The high achieving students consisted of students whose scores occurred within the upper 25%; while medium achieving students were those students whose scores fall within the middle 50%, and low achieving students included those students whose scores were within the bottom 25%.

Findings and Discussion

Null Hypothesis one (Ho₁)

There is no significant difference in the achievement of students taught Social Studies using Computer Assisted Instructional mode and those taught with conventional lecture method.

Table 1: Analysis of Covariance (ANCOVA) of the Mean Scores of Students' taught Social Studies Using CAI Mode and those taught with Conventional Lecture Method.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	34981.926 ^a	2	17490.963	421.499	.001
Intercept	1444.628	1	1444.628	34.813	.001
Pretest	26861.859	1	26861.859	647.319	.001
Treatment	1875.407	1	1875.407	45.194	.001
Error	9834.808	237	41.497		
Total	627740.000	240			
Corrected Total	44816.733	239			

^aSignificant at $P < 0.05$

Table 1 shows the ANCOVA analysis of the posttest scores of experimental and control groups. The main effects of treatment was produced at $P=0.001$. This means that, the main effect was significant at $p < 0.05$. Therefore, the hypothesis was rejected.

Since it was established that there was a significant difference between the groups, the mean gain was tabulated to locate the direction of the difference. The result is presented in Table 1.

Table 2: Mean Gain Scores of Students taught with CAI and those taught with conventional lecture Method.

Group	Pretest	Posttest	Mean Gain
Experimental	42.48	55.10	12.62
Control	36.67	43.47	6.80

Table 2 revealed that the experimental group has the highest mean gain of 12.62, while the control group has the lowest mean gain of 6.80. Therefore, the significant difference is in favour of the experimental group which was treated with CAI. This can further be illustrated graphically as shown in figure 1.



Figure 1: Graphical Illustration of the Posttest Mean Gain of the Experimental and Control groups. Source computer package for social science (SPSS).

Table 3: Scheffe Analysis of the Significant difference in the Mean Scores of Students' taught Social Studies Using CAI Mode and those taught with Conventional Lecture Method.

Scheffe						
(I) 1, 2, 3, 4, 5 and 6	(J) 1, 2, 3, 4, 5 and 6	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	27.75*	1.168	.000	23.83	31.67
	3	12.43*	2.402	.000	4.37	20.49
	4	.64	2.001	1.000	-6.08	7.35
	5	31.77*	1.121	.000	28.01	35.53
	6	51.22*	2.166	.000	43.95	58.49
2	1	-27.75*	1.168	.000	-31.67	-23.83
	3	-15.32*	2.302	.000	-23.05	-7.60
	4	-27.11*	1.880	.000	-33.42	-20.80
	5	4.02*	.887	.001	1.04	7.00
	6	23.47*	2.054	.000	16.58	30.37
3	1	-12.43*	2.402	.000	-20.49	-4.37
	2	15.32*	2.302	.000	7.60	23.05
	4	-11.79*	2.818	.005	-21.25	-2.34
	5	19.34*	2.279	.000	11.69	26.99
	6	38.79*	2.937	.000	28.94	48.65
4	1	-.64	2.001	1.000	-7.35	6.08
	2	27.11*	1.880	.000	20.80	33.42
	3	11.79*	2.818	.005	2.34	21.25
	5	31.13*	1.851	.000	24.92	37.35
	6	50.59*	2.619	.000	41.79	59.38
5	1	-31.77*	1.121	.000	-35.53	-28.01
	2	-4.02*	.887	.001	-7.00	-1.04
	3	-19.34*	2.279	.000	-26.99	-11.69
	4	-31.13*	1.851	.000	-37.35	-24.92
	6	19.45*	2.028	.000	12.65	26.26
6	1	-51.22*	2.166	.000	-58.49	-43.95
	2	-23.47*	2.054	.000	-30.37	-16.58
	3	-38.79*	2.937	.000	-48.65	-28.94
	4	-50.59*	2.619	.000	-59.38	-41.79
	5	-19.45*	2.028	.000	-26.26	-12.65

KEY

1. Exp High – Experimental group high ability
2. Exp medium – Experimental group medium ability
3. Exp Low – Experimental group low ability
4. Con High – Control group high ability
5. Con Medium – Control group medium ability
6. Con Low – Control group low ability

1, 2, 3, 4, 5 and 6 represent experimental group high ability, experimental group medium ability, experimental group low ability, control group high ability, control group medium ability and control group low ability respectively. The scheffes analysis in the table above indicated that there is observed significant differences in all the groups except between experimental group high ability and control group high ability. However, the groups that contributed more was between experimental group high ability and control group low ability with the highest mean score of 51.22 and highest upper boundary of 58.49 at 95% confidence level respectively.

Null Hypothesis two (Ho₂)

There is no significant difference in the achievement scores of male and female students taught Social Studies with Computer Assisted Instructional mode.

Table 4: Analysis of Covariance (ANCOVA) of Male and Female Students' taught Social Studies Using Computer Assisted Instructional Mode.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	24024.090 ^a	2	12012.045	241.541	.000
Intercept	74.557	1	74.557	1.499	.223
Pretest	23660.081	1	23660.081	475.763	.000
Gender	19.278	1	19.278	.388	.535
Error	5818.502	117	49.731		
Total	398031.000	120			
Corrected Total	29842.592	119			

Table 4. shows the analysis of variation for the data on the achievement scores of male and female students taught Social Studies with Computer Assisted Instructional mode. The results yield a P-value of 0.535. This showed that the result was not significant at $P > 0.05$. This indicates that there is statistically no significant difference in the performance of male and female students taught Social Studies with Computer Assisted Instructional mode. Therefore, the hypothesis was not rejected.

Discussion of Results

The result showed that there was a significant difference in the posttest mean scores of students taught Social Studies using Computer Assisted Instructional mode and those taught with conventional lecture method. It was discovered that the experimental group taught Social Studies using CAI performed significantly better than those taught with conventional lecture method. The finding is in agreement with the earlier findings of Uduosoro (2000); Decipher Cepni et. al.(2004) and Demirel (2004) established that the usage of visual instructional materials such as Computer Instructional Package is important in enhancing students' performance.

While, White (2006), Onasanya, Daramola and Asuquo (2006) and Yusuf (2006) in their separate studies in Social Studies, Mathematics and Introductory Technology subjects respectively found that students exposed to Computer Aided Instruction performed better than their counterparts taught with conventional lecture method. The result also corroborated the earlier findings of Ajelabi (2007) who clearly showed that students that were exposed to instructional media performed better than the students that were not exposed to the use of instructional media in the teaching of Social Studies. The finding implies that the effectiveness of CAI makes instruction more lasting and effective.

The result also buttressed the earlier findings of Bayrak (2008) who carried out his research in Pilli and Olusi (2008) in Mathematics, both of them examined the effects of Computer Aided Instruction and traditional method of instruction on the Junior Secondary School students achievement. The findings revealed that CAI significantly influenced students' achievements in both Physics and Mathematics than the traditional instructional method respectively. The findings also revealed that male students performed better than the female students using CAI.

However, the result is also in agreement with the earlier findings of Ragasa (2008) who examined the effects of Computer-Assisted Instruction on students' achievement as well as on attitude as measured by the posttest. He used a class of 38 sophomore college students of Basic Statistics and taught them with the use of Computer-Assisted Instruction. He used another class of 15 students and taught them with the use of the traditional lecture method in the University of the East, Manila. He found that the achievement posttest of the treatment group has higher estimated marginal means than the control group and it was reversed in the attitude posttest. The result also agreed with Kara and Kahraman (2008) who examined the effect of Computer Assisted Instruction on the academic achievement of Physics students of seventh grade Science class.

The results showed that there was a significant difference between posttest scores of the groups in favour of the experimental group.

The result showed that there was a significant difference in the posttest mean scores of high, medium and low ability groups of students' taught Social Studies using Computer Assisted Instructional mode and those taught with conventional lecture method. It was established that there was a significant difference between the groups.

Conclusion

From this research, it is evident that there was statistically significant difference in the achievement scores and achievement of high, medium and low ability levels of male and female students taught Social Studies using Computer Assisted Instructional mode and those taught with conventional lecture method.

Recommendations

The following recommendations are made based on the findings of this research.

1. For effective teaching and learning of social studies in Junior Secondary Schools in Niger State government should promote the use of CAIMOSOS in order to enhance the performance of students.
2. Teachers should use the CAIMOSOS for cooperative and group learning to promote male and female students' interactions because it was found to improve learning irrespective of gender.

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