

Effects of Instructional Materials on Academic Achievement in Geography Among Secondary School Students' in Michika Local Government Area, Adamawa State - Nigeria

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ABSTRACT

This study investigated the effect of the use of instructional materials on the academic achievement of students in Geography in senior secondary schools in Michika Local Government Area of Adamawa State. It was a pre-test, post-test control group quasi experimental design. Students were taught Geography. A pre-test was administered at the beginning of the period while post-test was administered at the end of the 3 weeks to 30 students from each of the experimental and control groups. The results revealed there is statistically significant difference in the students' academic achievement between students exposed to the use of instructional materials are used and those whom were not used in teaching Geography in senior secondary schools. The result also revealed that there is no statistically significant difference in academic achievements between boys and girls taught Geography when instructional materials are used. Based on the findings it was recommended that schools should provide enough instructional materials for teaching and learning of Geography, and that students should be encouraged to practice the use of instructional materials in their learning of Geography. Moreover, teachers should provide more exercises that will involve students using some instructional materials to develop good understanding of Geography concepts and principles.

Keywords: *Instructional resources, GAT, Quasi-experimental, Control Group, Geography*

I. Introduction

Instructional materials serve as a channel between the teacher and the students in delivering instructions. They may also serve as the motivation on the teaching-learning process. It is use to get the attention of the students and eliminate boredom. Instructional materials are highly important for teaching; especially for inexperienced teachers. Teachers rely on instructional materials in every aspect of teaching. Geography focuses on disciplinary change and paradigm shift which makes the use of instructional materials important in teaching and learning. Geography as one of the subjects at the secondary schools will be better facilitated when suitable and relevant instructional materials are prepared and utilized during its teaching and learning (Dhakal, 2014).

Instructional materials are essential and significant tools needed for teaching and learning of school subjects to promote teachers' efficiency and improve students' performance. They make learning more interesting, practical, realistic and appealing. They also enable both the teachers and students to participate actively and effectively in lesson sessions. They give room for acquisition of skills and knowledge and development of self- confidence and self-actualization. They are print and non-print items that impact information to students in the educational process. Instructional materials include items such as: kits, textbooks, magazines, newspapers, pictures, recording videos etc.

Agina-Obu (2005) submitted that instructional materials of all kinds appeal to the sense organs during teaching and learning. Instructional materials play a very important role in the teaching and learning process. It enhances the memory level of the students. At this time that education has spread wide and entirely, oral teaching cannot be the key to successful pedagogy. Therefore, the teacher has to use instructional materials to make teaching and learning process interesting.

Geography provides opportunities to develop key knowledge, skills, and values that enable students to become responsible citizens. The full and healthy geography education provides a connection to other people in the world, relationship with the environment, perceive the skills, knowledge and concepts and fundamental that help human understand (Tomal, 2004). The study of geography is divided into location, place, human/environment interaction, movement, and region which offer a mode of reasoning about the world. These themes can assist in studying every geographic issue locally, nationally and globally (Boehm, 2000).

The need to identify suitable instructional materials that will be properly used during Geography instruction is the focus of this study. It is a matter of concern because the academic performance of students in their Senior Secondary School Certificate Examinations (SSCE) in Michika Local Government Area, has been unsatisfactory for many years. The present study investigates into this state of affairs in order to find out if the use of instructional materials can alleviate the problem of poor student academic achievement in Geography in secondary schools in the Local Government Area.

Statement of the Problem

The teaching and learning of Geography is faced with some problems, which includes in particular students' poor achievement in external examinations in the SSCE. Could this be due to failure of teachers to use instructional materials in the teaching Geography? Could this be due to poor planning of Geography curriculum by educational planners? The poor use or not using appropriate instructional materials in teaching and learning is always a cause of poor understanding by students. This leads to poor academic performance. On the other hand, instructional materials that are properly used in teaching and learning improves students' understanding which also helps them retain facts. Therefore, in this research, the study will examine the use of instructional materials on students' academic achievement in Geography in secondary schools of Michika Local Government, Adamawa State of Nigeria. This is to determine whether the proper use of Geography instructional materials will bring about an improvement in the academic achievement of students or not.

Purpose of the Study

The purpose of this study is to determine the effectiveness of the use of instructional materials on the academic performance of students in Geography in senior secondary schools in Michika Local Government Area of Adamawa State. The specific objectives are to

- i. Determine the effect of instructional materials on students' academic performance in the teaching and learning of Geography in the senior secondary schools.
- ii. Find out if there are differences in academic achievements between boys and girls taught Geography by use of instructional materials.

Research Hypotheses

The following null hypotheses will be subjected to test:

H01: There is no significant difference between the students' academic achievement when instructional materials are used and when they are not used in teaching Geography in senior secondary schools of Michika Local Government Area, Adamawa State

H02: There is no significant difference in academic achievements between boys and girls taught Geography when instructional materials are used.

Significance of the Study

This research work will be significant to teachers because the findings from the study will help Geography teachers in choosing appropriate instructional materials capable of relieving students' tension towards the subject. This will improve students' academic performance in Geography. It will also motivate Geography teachers to develop interest towards utilizing teaching materials that will be a possible means of reducing failure in the school. The findings of this study will also help clarify to teachers the need for regular improvisation of suitable instructional materials, and effective ways of incorporating instructional materials into the lesson.

The findings of this study will be of significance to the curriculum planners and developers. The curriculum planners and developers will find the work useful for reviewing the Geography curriculum by laying emphasis on utilization of instructional materials so as to meet up with emerging needs of the students, which will lead to an improvement in academic performance of students.

This research will also be of significance to future researchers in this area of educational research on the effects of instructional materials use on students' academic achievement in Geography. They will find it useful because this study embodies a unique literary presentation on the subject, backed by its unique findings and recommendations. They will also find it useful because it will serve as an addition to the existing volume of research materials and literatures on the effects of instructional materials use on students' academic achievement in Geography, thus making such materials and literatures more available.

RESEARCH METHODOLOGY

This chapter describes the methods and procedures for data collection for the study. It also presents the population of the study, sample and sampling techniques used. Moreover, it shows how the research work was validated and how the data analysis was carried out.

Research Design

The research design for this study was the quasi-experimental design with non-randomized treatment and control groups. This is because there was no random selection of students to the groups. The classes were in intact groups, as allowed by the school authorities. The study involves two groups which are those involving the use of instructional materials (Experimental Group) and the group taught without the use of instructional materials (Control Group). Each was taught the same syllabus over the same period. They were given the same test to generate data before and after treatment period.

Research Instrument

The instrument used for data collection was the Geography Achievement Test (GAT). It was designed by the researcher. The test contained 25 objectives items on the topic Respiratory System. The test was developed by the researcher based on the SSCE curriculum. Each item had options A to D. There was only one correct answer to the question. Each correct answer was scored four marks, giving the total maximum of scores of 100 marks for the test. The test had a duration of one hour.

Population of the Study

The target population of the study was all senior secondary school (SS II) Geography students in the two selected secondary schools in Michika Local Government Area for the 2017/2018 academic session. The SS II students were drawn from Government Senior Secondary School, Michika, and Government Day Secondary School, Jang.

Sample and Sampling Technique

The sample for this study comprised sixty (60) Geography students. These students came from intact classes in two randomly selected schools' secondary schools in Michika Local Government Area. The selected schools include: Government Secondary School (GSS), Michika and Government Day Secondary School Jang. 30 students were used in each of the Experimental and Control groups.

Method of Data Collection

An introductory letter was collected from the Head of Department (HOD) of Science Education to the Principals of the sampled schools in Michika Local Government, Area. The students in each class were taught Geography for 3 weeks. The Experimental and Control groups were taught the same content of the curriculum. The Experimental Group was taught with the use of instructional materials incorporated into the lesson. The Control Group was not exposed to the use of instructional materials.

Data was obtained from administering the Geography Achievement Test (GAT) during Pre-Test to both groups. The same Geography Achievement Test was administered after the treatment period of instruction of 3 weeks. The Geography Achievement Test was marked and scored to determine their achievement.

Validation of the Instrument

The instrument for this study was validated by some experts in the field of measurement and evaluation in the Department of Science Education in Adamawa State University, Mubi. This was to determine the face and content validity of the instruments. Consequently, all necessary corrections and modifications from the experts were affected to refine the research statement.

Method of Data Analysis

The analysis involved statistical testing of the hypotheses stated in the study. The level of significance adopted was $P < 0.05$. The 0.05 level of significance forms the basis for retaining or rejecting each hypothesis. Data collected was analyzed in accordance with the stated hypotheses to test the two hypotheses using t-Test statistic.

RESULTS AND DISCUSSION

The results of the study are presented based on the analysis of the pre-test and then the post test scores of performances. The analyses comprise descriptive statistics and inferential statistics. The inferential statistics involved use of t-test analysis to find out if differences between achievement scores of the groups were statistically significant.

This study was a quasi-experimental design in which a pre-test was carried out using the GAT instrument. Results of the students' performances were tested using a t-Test analysis. This was done by comparing the achievement scores in the experimental and control groups. The experimental group comprised those students who will be taught the Geography topics with the support of the teacher using instructional materials. The control group had students who will learn the same Geography topics but the teacher will not use instructional materials in teaching. Each learning group had 30 students. Each group was from a different school in the study area. The pre-test was conducted before the instruction period on the Geography topics.

The pre-test was aimed to find out if students in the experimental and control groups were of equal levels of Geography knowledge before the teaching and learning of the topics in the curriculum. In order to find this out, the achievement scores of the two groups were subjected to t-Test statistical analysis. The results of the analysis are summarized in Tables 1 and 2.

Table 1: Descriptive Statistics of Pre-Test Scores of Students Learning Geography in the Experimental (X_1) and Control (X_2) Groups Before Instructional Treatment

Instructional Treatment Group	N	Mean Score	Mean Difference	Std. Deviation	Std. Error Mean
X_1 : With Use of Instructional Materials	30	36.27	2.4000	10.18089	1.85877
X_2 : Without Use of Instructional Materials	30	38.67		10.14833	1.85282

The descriptive analysis shows that the mean score of the Experimental Group (X_1) was 36.27 while that of the Control Group (X_2) was 38.67. There was a mean score difference of 2.40 in favour of the Control Group. In order

to determine if the difference was statistically significant, the t-Test was applied to the results of scores of the two groups. The result is presented in Table 2.

Table 2: t-Test Analysis of Pre-Test Geography Achievement Scores of Students in the Experimental (X₁) and Control (X₂) Groups before Instructional Treatment

Source	Mean	Mean Difference	SE Mean	df	t	Sig. (2-Tailed)
X ₁	36.2667	-2.4000	2.62449	58	-0.914	.364
X ₂	38.6667		2.62449			

The results in Table 2 show that there was no significant difference between the achievements of the Experimental and Control Groups ($t = 0.914$; $df = 58$; $p > 0.05$). The students in the two groups were therefore of equivalent achievement levels in Geography before the instructional treatment.

Hypotheses Testing

H₀₁: There is no significant difference in the achievement mean scores of students taught Geography by the use of instructional materials and those without use of instructional materials.

Students in the Experimental Group, X₁, were taught with the support of instructional materials. The teachers used various instructional materials during each Geography lesson. Students in the Control Group, X₂, were not taught Geography with the use of supporting instructional materials. The performance of students in the two groups were compared to find out if there was a significant difference between the achievement mean scores. A t-Test was carried out on the results of the two groups (Table 7). This followed a descriptive statistical analysis done on the group mean scores as summarized in Table 6.

Table 3: Descriptive Statistics of Post Test Scores of Students Taught Geography in the Experimental (X₁) and Control (X₂) Groups Before Instructional Treatment

Instructional Treatment Group	N	Mean Score	Mean Difference	Std. Deviation	Std. Error Mean
X ₁ : With Use of Instructional Materials	30	55.8667	11.20000	10.83969	1.97905
X ₂ : Without Use of Instructional Materials	30	44.6667		7.79626	1.42340

Table 3 shows that the mean scores were 55.87 (X₁) and 44.67 (X₂). This gave a mean score difference of 11.20 in favour of X₁ which was the Experimental Group. A t-Test was then carried out to find out if the difference of 11.20 between achievements of the two groups was statistically significant. The result is summarized in Table 4.

Table 4: t-Test Analysis of Post Test Achievement Scores of Students Taught Geography Using Instructional Materials (X₁) and those without Use of Instructional Materials (X₂)

Source	Mean	Mean Difference	SD	SE Mean	df	t	Sig. (2-Tailed)
X ₁	55.8667	11.20000	10.83969	1.97905	58	4.594	.000*
X ₂	44.6667		7.79626	1.42340			

*Significant; $p < 0.05$.

The analysis in Table 4 shows that the difference in academic achievement of the Experimental Group (X₁) and Control Group (X₂) is statistically significant ($t = 4.594$; $df = 58$; $p < 0.05$). The mean score difference of 11.20 in favour of the experimental group (X₁), which was taught with the support of instructional materials was statistically significant.

Ho₂: There is no significant difference in the academic achievement scores of male and female students taught Geography with the use of instructional materials in the study area.

The achievement scores of male and female students in the Experimental Group, X₁, were compared to find out if there was a significant difference based on gender. A t-Test was carried out on the results of the male students and the females. Table 5 gives a summary of the descriptive statistics of the results. The result of the t-Test analysis is presented in Table 6.

Table 5: Descriptive Statistics of Post Test Scores of Male and Female Students Taught Geography in the Experimental (X₁) Under Instructional Materials Use Treatment

Gender	N	Mean Score	Mean Difference	Std. Deviation	Std. Error Mean
Male Students	18	56.3333	1.16667	9.89949	2.33333
Female Students	12	55.1667		12.54688	3.62197

Table 5 shows that there was a marginal difference of 1.17 between the achievements of the male and female students. The difference was in favour of the male students who scored 56.33 as against 55.17 for the females. The t-Test was carried out to check if this difference was statistically significant. The outcome is summarized in Table 6.

Table 6: t-Test Analysis of Post Test Achievement Scores of Male and Female Students Taught Geography Using Instructional Materials in the Lessons

Source	Mean Score	Mean Difference	SD	SE Mean	df	t	Sig. (2-Tailed)
Male	56.3333	1.1666	9.89949	2.33333	28	0.804	.428
Female	55.1667		12.54688	3.62197			

Not Significant; $p > 0.05$.

The results in Table 6 show that there was no statistically significant difference between the mean achievement of the male and female students taught Geography with the support of instructional materials ($t = 0.804$; $df = 28$; $p > 0.05$). The male and female students exposed to the use of instructional materials to learn Geography achieved equally in learning the topics. This implies that there was no gender effect on learning Geography when teachers use instructional materials to teach the topics.

Discussion

This research was aimed at determining the effects of instructional materials use on the teaching and learning of Geography in Michika Local Government Area. Two hypotheses were tested on the data obtained from the Geography Achievement Test (GAT) instrument. The data was obtained on the achievement of students exposed to the use of instructional materials (X₁) and those not exposed to the use of instructional materials (X₂). The analysis reflects students' academic achievement scores in the pre-test and post-test administered to them.

This study found out there is statistically significant difference between the students' academic achievement when instructional materials are used and when they are not used in teaching Geography in senior secondary schools. This finding is in agreement with Oladejo, Olosunde, Ojebisi and Isola (2011) whose findings revealed that the students who were taught with instructional material achieved statistically significantly higher scores than those who were taught by the use of conventional method. Oladejo (2011), also observed that using instructional materials allows students' interaction which make students to achieve better in their lessons. This is because it makes students use their intellectual ability during learning and teaching processes.

There is no statistically significant difference in academic achievements between male and female students taught Geography when instructional materials are used. This finding is also in disagreement with Muodumogu and Yisa (2013) who found that gender has no significant effects on the academic achievement of students in their writing skills development.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Conclusively, there is significant difference between the students' academic achievements when instructional materials are used and when they are not used in teaching Geography in senior secondary schools. Therefore, teachers need to use instructional materials as much as possible to improve secondary school students' learning of Geography. This strategy is important because it can also remove gender differences in students' achievement in the subject. This is because when instructional materials are used both the male and female students will significantly improve their achievements equally.

Recommendations

- Based on the findings of this research, the following recommendations are made
- Schools should provide enough instructional materials for the teaching and learning of Geography.
 - Students should be encouraged to practice the use of instructional materials in learning Geography.
 - Teachers should engage students to have exercises in which they will use instructional materials to develop their understanding of Geography.

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