



Effects of Collaborative Teaching Strategy on Senior Secondary Students' Achievement in Map Reading in Misau, Bauchi Nigeria

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ABSTRACT

As a result of consistent poor achievement of senior secondary school students in geography, this study was conducted to determine the effects of collaborative teaching strategy on senior secondary students' achievement in map reading in Misau, Bauchi Nigeria, quasi experimental design was adopted in the study. The population of the study was 427 The SS II Geography students comprise 246 males and 181 females. The sample of the study was 101 (59 males and 42 females). The researcher used simple random sampling and selected two secondary schools. The instruments used for data collection for this study were the map reading achievement test (MRAT) after validation process by experts, and a pilot study, the reliability confident of the instrument was 0.78 obtained (PPMCC) using (SPSS). Data were analysed using mean and standard deviation to answer the research questions and the Z-Test to test the null hypotheses. Findings of the study revealed that students that were exposed to collaborative teaching strategy achieved significantly higher than the control group that received no treatment. Also, there was no significant gender difference in achievement of the experimental group. This shows that collaborative teaching strategy is a gender friendly strategy. It was recommended that that teacher should be trained by the ministry of education and other educational contributing bodies like non-governmental organizations, and policy makers on the use of collaborative teaching strategies through workshops and seminars.

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INTRODUCTION

The importance of education for national development and progress cannot be overemphasized. This led Nigeria to realize the value of education as an influential tool for national development and progress, and consequently adjusted its educational philosophy and methodology to march the ideals and challenges of changing the economic and social structure of modern society (Sofora & Egbedokum 2010). Education also encourages the civilization of productivity by facilitating individuals to discover their creative potential in them and apply the same development of the existing skill and technique of performing specific tasks, thereby increasing the efficiency of their societal efforts (Obasanjo, 2012). Therefore, education teaches and trains

people to be valuable to themselves and the society they live. By this, they have to be productive and determine their creative abilities and use this to carry out specific tasks to attain self-actualization. Thus, one of the objectives of Geography is to train pupils in nature study, by helping the pupils to acquire knowledge of their physical and social environment and thus broaden their outlook (National Examination Council 2019).

Teaching and learning Geography in Nigeria started in the second half of the 19th century, which was a primary school subject, which was dominated by British influence. He added that, in the wake of national independence, there was a steady growth of Geography in Nigeria as indigenous geographers such as Mabogunje (1970) began criticizing the

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fundamental objectives, content, and methods of school Geography, which they found inadequate for the needs of Nigerian children. Today Geography is one of the senior secondary school core-curriculum subjects, which is his position in the national curriculum under section 3 of the post-basic school subject (humanity) as a field of study in the Nigerian National Policy on Education 6th edition as revised (2013).

From the development of geography as a science during the Greek classical period until the early nineteenth century, geography consisted mainly of cartography, astronomy, and the description of natural phenomena and local or regional features of the earth's surface (Weichhart, 2013) characterized by an integrative approach that makes use of modern spatial and statistical techniques as well as modern technologies. Such technologies are Geographic Information Systems (GIS), the Global Positioning System (GPS), and Remote Sensing (RS).

They help us to understand the complexity of the earth's system. Geographical education is infused with several key concepts of Geography, for example, the concept of scale, the impact of humans on the environment, the impact of the environment on humans and change over time and space (Reinfried and Hertig, 2011). At its core, Geography has evolved to be a discipline that actively pursues a diverse range. Through the teaching and learning of Geography, certain abilities, values, and approaches were developed in the students. These include insightful/critical thinking, intense observation, accurate measurement, and pleasure of the environment among others is vital to man's life on the surface of the earth (Adeyemi, 2014).

The study of Geography is about more than just memorizing places on a map as explained by Obama (2012). It about understands the complexity of our world, appreciating the diversity of cultures that exists across continents, and in the end, it is about using all that knowledge to help bridge divides and bring people together. This shows that the study of Geography is very crucial to the unity and development of people all around the world. Many empirical studies have shown that geography as a discipline can foster

national and international unity (Gregory, 2020; Fan, Monday & Tandu, 2014), as well as enhance social, economic, and environmentally sustainable development. This is possible because geography is about understanding conditions in other places and our connections with those places. Students should learn about the land, climate, economy, politics, and culture of their environment as well as of other places. Gersmehl (2014) opined that knowledge of Geography and map reading will help students deal with an increasingly interconnected and often highly competitive world. Therefore, map reading as a field in Geography has many skills that turn out to be obsolete in the digital era in this regard map remains an important tool for building students' spatial reasoning skills and helping them make sense of our world.

There are different types of teaching strategies adopted in Nigerian secondary schools, but the conventional method of teaching is the teaching method commonly used by most teachers in Nigerian schools from the primary to secondary level of education. This method is teacher-centered and characterized by the teacher talking to the class most of the time while the students listen and take down notes and occasionally ask questions (Belcher 1996 as cited by Justen 2015). Yusuf (2012) stated that some of the teaching strategies commonly used by teachers include. Lecture, Discussion, Demonstration, Laboratory/experimental, Field trip, Assignment, Play-way, Peer teaching, Role-playing, Project, Discovery, etc. However, collaborative teaching facilitates focusing on the learner using a variety of methods such as one teach one assist. Marble & Green (2011) establish that single-teacher teaching was negatively connected with student achievement; conversely, collaboration control over resources and responsibility for the result was positively connected with student achievement.

Collaboration technique is a term that has been defined in numerous ways across diverse fields. Bandung and Webbena (2012) defined collaboration as a process in which two or more individuals work together to integrate information to enhance student learning. The

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authors argue that various notions of working together have been confused with collaboration from other joint efforts such as coordination and cooperation. Collaboration is a promising mode of human engagement but to become more than a fad, a theoretical structure and framework are needed to guide individuals and groups toward successful collaboration (John-Steiner 2012). Collaboration in the twenty-first century reshaped organizational and professional operations across the world toward becoming more knowledge-based. Therefore, the need in society to think and work together on issues of critical concern has increased (Austin 2019) shifting the emphasis from individual efforts to group work, and from independence to the community (Leonard and Leonard 2016).

Academic achievement of a student as the ability of the student to study and remember facts and being able to communicate his knowledge orally or in written form even in an examination condition. Academic achievement is generally used to determine how well an individual can assimilate, retain, recall and communicate his knowledge of what has been learned. Kaplan and Saccuzzo (2015) stated that academic achievement, which is usually measured with a test, refers to what is carried out under existing circumstances that consider the process of accessing and utilizing the structure of knowledge and abilities and a host of affective, motivational and stylistic factors that influence the ultimate responses.

Usman (2018) has separately observed that the lecture method encourages rote learning without understanding, thereby resulting in poor performance. In addition, students are not expressing their potential in the lesson, (Mbah, 2017). Obeka (2010) conducted a study and found that students perform significantly low on retention and achievement when students taught with the lecture method. Another study conducted by Usman (2018) found that students do not perform better when taught with the lecture method. Some studies (Woodlanda, Lee & Randall, 2013; Meirink, Meijer & Verloop, 2007) have pointed out that teacher learning can be positively improved through collaboration with colleagues, through

sharing ideas, experience, and resources, through giving feedback to become reflective about the teaching practice, and through supporting each other.

Nigerian secondary school Geography teachers have been accused in different studies that they poorly teach Geography generally and map reading in particular (Bandugu and Wabbene 2012; Amosun 2016; Adeyemi 2016 and Anny 2016). Amosun (2016) stated that geography teachers in Nigerian secondary schools seem excessively scarce to teach Geography and therefore, students look critically worried about the subject. This led to a lot of students developing an extreme dislike for geography, which generally affects the student's academic achievement. Other causative factors of poor academic achievement in geography and map reading include inadequate instructional materials, teachers' poor improvisation skills, and teacher-centered methods of teaching like the lecture method (Falana 2015).

Salami (2010) showed that students' academic achievement depends on their cognitive ability of the students, therefore, a suitable method of instruction is needed that could improve the academic achievement of students. Lawali, Sadi, Abbas & Kangiwa (2015) opined that defective teaching produces defective learning. Based on the analyses of the Central Education Zonal Office Darazo, under the ministry of education Bauchi State, tables 1 indicated that the Geography performances of students in Misau are not encouraging. In 2013 – 2015, the percentage passes at credit level and above ranges between 19.50% to 36.02% respectively. Furthermore, the percentage of the student's performance in 2016 and 2017 passed at credit level and above ranges between 16.91 and 28.81 respectively. Here the analyses illustrated a significant decline over the year. Because of this, the existing study was carrying out the relative effects of collaborative teaching strategies on students' academic achievement and attitude in map reading.

Research Questions

The following research questions would answer the objective of the study.

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1. What is the effect of collaborative teaching strategy on students' academic achievement in map reading in senior secondary school Geography in Misau?
2. Is there any gender difference in students' academic achievement in map reading in secondary schools in Misau?

Research Hypotheses

The following null hypotheses would be tested at $p > 0.005$.

H₀₁ There is no significant difference in the mean score of students taught map reading with collaborative teaching strategy and those taught with lecture method in Misau.

H₀₂ There is no significant difference in the achievement of male and female students taught map reading with a collaborative teaching strategy in Misau.

METHODOLOGY

Quasi-experimental design was adopted in this study. Specifically, the pretest-posttest non-equivalent control group design was used. According to Gall, Gall, and Borg (2007), a quasi-experimental design can be used when it is not possible for the researcher to randomly sample the subjects and assign them to treatment groups without disrupting the academic program of the schools involved in the study or The study adopt quasi-experimental if the researcher has no total control over the study subjects (Adamu 2014). Therefore, this design is considered suitable for this study because intact classes (non-randomized groups) were used.

The population for this study consists of the entire nine public senior secondary schools in

Misau Local Government Area Central Education Zone Darazo. Bauchi State. The target population includes all Geography students in SS II of Misau. The total population is 427 students offering Geography. The SS II Geography students comprise 246 males and 181 females. (Darazo Central Education Zone School Census Report, 2018). The sample for the study comprised 101 Senior Secondary II Students (59 males and 42 females). The students were selected from two co-educational Senior Secondary Schools. i.e School A (27 males and 16 females) and ii. School C. (32 males and 26 females) the sample size in each of the schools was 59 and 42 totaling 101 respectively. The researcher used simple random sampling and selected two secondary schools (Experimental and Control) from the 9 public senior secondary schools in Misau.

The instruments used for data collection for this study were the map reading achievement test (MRAT) after validation process by experts, and a pilot study, the reliability confident of the instrument was 0.78 obtained through the use of Pearson Product Moment Correlation Coefficient (PPMCC) using statistical package for social sciences (SPSS). Data were collected after the treatment and analysed using mean and standard deviation to answer the research questions and the Z-Test to test the null hypotheses.

RESULTS

Research question 1:

What is the effect of collaborative teaching strategies on students' academic achievement in map reading in senior secondary school geography students in Misau?

Table 4.1: Students Pre-Test Post-Test Achievement Mean Scores and SD in Map Reading for Experimental and Control Group.

Groups	N	Pre-Test		Post-Test		Mean Gain Score
		X	Sd	X	Sd	
Experimental	46	32.83	3.45	60.38	1.74	27.55
Control	55	28.85	6.39	52.00	4.23	23.15

Table 4.1 revealed that the pre-test score of the experimental group was 32.83 while the post-test score was 60.38. On the other hand,

the pretest means score of the control group was 28.85 while the post-test was 52.00. The pre-test and post-test mean score differences were 27.55

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and 23.15 for both the experimental and control group respectively, with higher mean gain in the experimental group. The SD for both the experimental and control groups at the post-test is 1.74 and 4.23 indicating that the scores of the experimental group are close to one another while that of the control group indicated a wide gap between their scores.

Research Hypothesis 1:

H0₁ There is no significant difference in the mean score of students taught map reading with collaborative teaching strategy and those taught with conventional method in Misau.

Table 4.2: Z- test Statistics of Map Reading Achievement Between the Experimental and Control Groups.

Groups	N	X	SD	df	p-value	Decision
Experimental	46	60.38	12.81	100	0.037	Sig
Control	55	52.00	12.00			

Table 4.5 indicated that the mean score of the experimental group is 60.38, while the control means the score is 52.00. DF 100 with a P-value of 0.037. since the p-value is less than α 0.05 level, the null hypothesis is rejected. Therefore, there is a significant mean score difference between the experimental and control

group in favor of the experimental group taught by the collaborative teaching method.

Research Question 2:

Is there any gender difference in students' academic achievement of map reading in secondary schools taught by collaborative teaching methods?

Table 4.3: Male and Female Students' Pre-test and Post-test Achievement Score and Standard Deviation for Experimental Groups

Sex	N	Pre-test score		Post-test score		Mean Gain Score
		X	SD	X	SD	
Male	29	28.18	3.11	34.36	4.18	6.18
Female	17	21.34	1.88	37.11	2.18	15.77

Table 4.2 revealed that the pre-test means score of the male experimental group is 28.18 while the post-test score is 34.36. On the other hand, the pre-test means score of the female experimental group is 21.34 while the post-test mean score of the female experimental was 37.11, and the pre-test and post-test mean score differences of both the male and female experimental group are 6.84 and 2.75 respectively. The standard deviation of the male pre-test is 3.11, the post-test is 4.18, likewise, the female pre-test standard deviation is 1.88, post-test is 2.18. Thus, there is an increase of 6.18 in

the mean gain score of males. This increase is much greater when compared to that of the female, which is 15.77. This is an indication that the female achieved higher than the male in the academic achievement of map reading using a collaborative teaching strategy.

Research Hypothesis 2:

H0₂ There is no significant difference in the achievement of male and female students' academic achievement of map reading taught with collaborative teaching strategies in Misau.

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Table 4.4: Z-test Analysis of Male and Female Students' Academic Achievement in Map Reading Taught by Collaborative Teaching Strategies

Groups	N	Mean	DF	P- Value	Decision
Male	29	62.54	42	0.067	Not Significant
Female	17	58.45			

P-value is greater than α 0.05 level of significance. Table 4.6 indicated that the mean score of male students in the experimental group is 62.54, while the mean of female students in the experimental group is 58.45 with a DF of 42. The p-value is 0.067 which is greater than α 0.05 level of significance. The null hypothesis is accepted. Therefore, there is no significant difference between the performance of male and female students in map reading taught by the collaborative teaching method.

DISCUSSION OF FINDINGS

The findings of the study revealed that there is a post-test score difference in both the experimental and the control groups in favor of the experimental group. This supported the findings of Tenvo, (2017), Adeyemi, and Cishe, (2016) that students perform better at the post-test compared to when they were not taught as the essence of the pretest is just determined by the level of equivalence between two groups.

It was also discovered students taught using the experimental group scored higher than those taught by the lecture method. Also, there is a significant mean score difference between the experimental and control group in favor of the experimental group. This corroborates the findings of Tenvo, (2017), Adeyemi and Cishe, 2016, Anny, 2016, Jestin, 2016, Banduga and Webber, 2012, and Kemlani, 2011). This indicated that the collaborative teaching method is an effective method of teaching all subagent of which teaching map reading and geography is not an exception. The result of hypotheses testing revealed that the experimental group taught by the collaborative teaching strategy performed better than the control group that was taught by the traditional teaching method (lecture method) significantly. Also, the study discovered that there is no significant mean score difference between male

and female students in map reading performance taught by the collaborative teaching method.

RECOMMENDATION

Base on the findings of the study, the researcher recommended that teacher should be trained by the ministry of education and other educational contributing bodies like non-governmental organizations, and policy makers on the use of collaborative teaching strategies through workshops and seminars.

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