

In Kano State, Nigeria, The Effects of Cooperative Instructional Strategies on The Performance of Secondary School Students in Geography

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Abstract: The impacts of cooperative instructional methodologies (think-pair-share and Student Teams-Achievement Divisions) on secondary school students' performance in geography in Kano State, Nigeria were explored. The study used a pre-and post-test quasi-experimental design. A total of four intact classes from two senior secondary schools in the Nassrawa Educational Zone of Kano State, Nigeria, were used to collect data. For the study, three research questions and three hypotheses were developed. For data collection, the researcher used two instruments: the Geography pre-diagnostic test and the Geography post-diagnostic test. To answer research questions, mean and standard deviation were employed, and hypotheses were tested using analysis of covariance (ANCOVA) with pre-test scores as covariates to correct for the sample's baseline differences. A partial eta squared value of 0.017 suggested a substantial association between the pre-test and post-test scores on the Geography Performance Test. The findings showed that therapy had a significant negative impact on students' performance ($t(93) = -0.633$, $p=0.528$) and ($t(93) = 1.415$, $p=0.160$). Based on the findings, it was suggested that geography teachers engage in collaboration in which students are held accountable for each other's achievements. There are no gender differences between the two tactics. Students who were taught using the think-pair-share and student team accomplishment division methodologies outperformed those who were taught using the traditional method.

I. INTRODUCTION

It is thought that the process of teaching and learning has existed since the beginning of time. Facilitation and careful management of students' learning were key components of this approach. Students' interest in the information being taught, the methods, and the resources used by the teachers should be piqued through meaningful teaching and learning activities (Abimbola, 2001). For many years, several teaching pedagogies have been employed in the effort to provide a medium through which students can acquire appropriate knowledge, skills, attitudes, and values. Despite the adoption of a variety of instructional methodologies, students continue to struggle in a variety of topics, including Geography. Many students have withdrawn from geography classroom activities as a result of their failure. Which eventually led to the low academic performance of secondary school students,

particularly in Kano state, with a significant impact on students' geographic awareness.

Only 23.09 percent of students had credits in geography, according to the West African Senior Secondary Certificate Examination (WASSCE) result summary by Subject (2019). There are efforts underway to find a remedy to the high percentage of failure among students in Senior Secondary Schools. One such endeavor focuses on the topic of instructional approaches, which has sparked a variety of studies. Students' poor exam performance, according to Adamu and Usman (2014), is mostly due to the employment of ineffective teaching methods. Teaching methods, according to Abdul (2007), are the methods by which a teacher instructs students to pass on knowledge. Lectures, discussions, and demonstrations are some of the most popular techniques.

In the 16th century, the term "conventional mode of teaching" was originally used to denote oral instruction given by a teacher in front of a group of students. It primarily entails an educator giving a group of pupils an oral presentation. This strategy is the most practical and makes the most sense, especially in larger classrooms. In Nigeria, it is fundamental to teaching at all levels. According to Abidoye and Oguniyi (2012), the traditional teaching style is arguably the best teaching method in many situations and for many students, particularly when it comes to communicating conceptual knowledge. When giving current information, summarizing content, customizing material to the background and interests of a specific set of students, and focusing on major concepts, principles, or ideas, the lecture style is the most effective (McKeachie & Svinicki, 2014). Furthermore, according to Akinlaye (2010) and Ogunlade (2019) delivering too much content for a specific class is one of the most significant hurdles to an effective traditional technique. Overburdening pupils' information processing capability to the point of frustration and abandonment is an easy pitfall to fall into. When fewer points are offered, students learn more effectively. However, questions have been raised about learner activation in the teaching and learning process. Most traditional teaching approaches rely on students' ability to listen as they passively take facts from lectures or teachers (Adamu & Usman, 2014). Their ability to think critically,

analyze information, communicate effectively, and collaborate is unaffected. The interactive pedagogy of cooperative learning was born from an attempt to maximize students' learning abilities beyond listening capabilities.

All children would learn how to collaborate with others, compete for pleasure and satisfaction, and work independently in an ideal classroom. Within each lesson, the teacher selects the objective structure to use. Cooperation is the most crucial goal structure to apply in learning circumstances, and it should be used most of the time (Johnson & Johnson, 2009). Individuals in cooperative situations desire outcomes that benefit them as well as the other members of the group. Although cooperative learning tactics come in a variety of shapes and sizes, the focus of this research is on students' team achievement division and Think Pair sharing strategies.

Students' Team Achievement Division is a small-group educational technique that encourages students to collaborate to enhance their own and each other's learning. The team success division of the students is collaborating to attain common objectives. Competitive and individualistic learning can be contrasted with cooperative learning. It can also be accomplished through a variety of methods (Woolfolk, 2011). The team success division of the students is collaborating to attain common objectives. However, according to Huang, Liao, and Chen (2014), some students prefer not to work in groups, indicating that cooperative learning is not for everyone. Another cooperative learning technique emerged as a result of this, allowing students to learn independently while sharing their information with the pair. Think Pair Share is the technical name for this.

The Think Pair Share method supports deep learning by allowing students to produce knowledge rather than just receive it (Omoshehin, 2004). It also emphasizes what the student must do to learn rather than the course content or the teacher's delivery of knowledge. Think Pair Share, a type of cooperative learning, is one of the educational approaches that, when properly implemented, can significantly improve student performance (Baker & Clark, 2010.; Ogunlade and Ogunlade, 2018). The Think Pair Share strategy appears to be more useful than other instructional strategies, according to Adeyemi (2002), Amosun (2002), and Qia and Jin (2010), because it has more positive effects on students' achievement and information retention. Cooperative learning practices boost student performance, according to Chang and Mao (2009). According to Sare and Yesmin (2013), pupils who prefer cooperative learning outnumber those who do not.

Think pair share and students team achievement division strategies may appear to be more beneficial and effective strategies for raising senior secondary school students' performance beyond current limits and satisfying current development in various subjects, including geography.

One of the problems affecting the teaching and learning process at the Secondary School level in Nigeria is

the use of a conventional method (Esan, 2009). Research studies have revealed the influence of methods of instruction on students' attitudes towards learning. Nigeria as a developing country needs great attention and effort to be paid towards improving the methods and approaches used by its secondary school teachers to inculcate better knowledge in her young citizen which is the key to development. In Nigeria, there has been a decline in students' academic performance at both internal and external examinations. This has been a source of concern for government and researchers as well as other stakeholders. The factors that are attributed to learners' poor performance include inadequate teaching and learning resources, unqualified teachers, negative teacher/ student attitude towards the subjects, and ineffective teaching methods (Astudilo & Naiz 2012). In an attempt to address these factors particularly teaching strategies, there is a need for a better approach that can arouse and sustain student interest to learn concepts. What role can Think Pair Share and the Students' Team Achievement Division selected from Cooperative Instructional Strategies play ineffective learning of geography. Which of these cooperative learning strategies can address the issue of poor performance in geography as reported by previous studies (Adamu & Usman, 2014; Dikko, 2009; Ogunlade & Akhigbe, 2016). This study, however, focused on examining the effectiveness of Think Pair Share and Students Team Achievement Division Instructional Strategies on the performance of Secondary School Students in Geography. The study is also interested in investigating the extent of

The two cooperative learning methodologies have a gender bias. The following researcher questions arose as a result of the study:

- 1) How do Think Pair Share and Students Achievement Division instructional tactics affect secondary school students' Geography performance?
- 2) What influence does the Think Pair Share technique have on male and female secondary school students' Geography performance?
- 3) What effect does the students' team achievement division method have on male and female secondary school students' Geography performance?

The following null hypotheses were proposed during the investigation and will be assessed at a significance level of 0.05.

Ho1 - There is no significant change in secondary school students' Geography performance when they are exposed to the Think Pair Share and Students' Team Achievement Division Techniques.

Ho2 - When secondary school pupils are taught utilizing the Think Pair Share instructional strategy, there is no significant change in their performance in Geography.

Ho3- When secondary school students are exposed to the Students' Team Achievement Division instructional strategy,

there is no significant difference in their Geography performance between male and female students.

II. METHODOLOGY

The non-randomly and nonequivalent exposure group design was chosen as the quasi-experimental research design. The design was chosen based on White & Sabarwal's (2014) recommendation that a quasi-experimental design is used when a study includes determining the influence of treatment(s) on a group(s) of people. The design is regarded as suitable since it allows the researcher to determine the interaction of an independent variable (Think Pair Share and Student team achievement division learning strategies) with a dependent variable (Student team achievement division learning strategies) (performance of students in Geography concepts). The study's target population consists of all 548 public senior secondary schools in Kano State's 14 educational zones, with a total of 74662 students (56446 male students and 18216 female students). Four entire SS2 geography classrooms, two from each school, make up the sample. The schools and classes were chosen using the purposive sampling technique, which is permissible under a quasi-experimental design. The study is divided into two groups: Think pair sharing and Students' team achievement division. The PDIagnostic Geography Performance Test (PDGPT) and Geography Performance Test (GPT) were designed as the data collection instrument. It is made up of 25 elements that were chosen from former WASSCE objective questions from 2010 to 2016, and it is set up in a multiple-choice format. The 25 elements were based on the selected topic content (Map work and Climate) in the senior secondary school Geography curriculum. The items were set up in a four-option multiple-choice format. Standardized objective questions from WAEC previous questions from 2010 to 2016 were chosen for the content criterion-related and construct validity of this test instrument. The study's aims were the subject of around 35 questions. Three experts were asked the questions, one from the Department of Educational Foundation and Curriculum, Instructional Technology Section, Ahmadu Bello University Zaria, and the other two from the Department of Educational Foundation and Curriculum, Instructional Technology Section, Ahmadu Bello University Zaria. One from Bayero University Kano's Department of Geography and one from Bayero University Kano's Faculty of Education's Test and Measurement.

Because of the different examination years, some of the questions were repeated. As a result, 25 questions were chosen. This is done to ensure that the questions are clear, relevant, and related to the topics taught, which are, respectively, map work and climate. The study's data was gathered using specific methodologies. First, a letter of introduction was obtained from the Department of Educational Foundation and Curriculum, Faculty of Education, Ahmadu Bello University, Zaria, for presentation to the various school authorities, with consent from the principals of the selected schools. The experiment was aided by research assistants (the typical SSII geography teachers for the schools).

During the first week before the start of the experimental teaching, the two participation groups in the study were given a pre-test. As a result, the PRE-GPT was utilized to create a statistical baseline for their entry habits. A lesson plan for each group was developed in the same way, demonstrating the contrasting tactics used in educating the two groups. After presenting the specified topics (Map work and Climate) to both groups for six weeks utilizing the TPS and STAD techniques in the experimental groups, both groups were given a post-test to compare their performance over the previous eight weeks.

The information gathered was examined in three stages. Data were entered into the Statistical Package of Social Sciences (SPSS) version 23.0 in the first stage. The software was used to create a table of participant frequencies (Students). The SPSS was also utilized in the second stage to calculate percentage scores, mean, range, and standard deviation, which were used to respond to research questions. Hypothesis one was examined using Analysis of Covariance, whereas hypotheses two and three were assessed using an independent sample t-test in the test of null hypotheses. The t-test, according to Christin (2008), is the finest parametric statistical instrument for testing null hypotheses concerning differences between two groups.

Discussions and Findings

The effectiveness of Think Pair Share and Students Team Achievement Division instructional strategies on secondary school students' Geography performance is the first research question.

Table 1: Means and standard deviations of secondary school students taught geography using TPS and STAD

	N	Mean	SD	SE	95% Confidence Interval for Mean		Min.	Max.
					Lower Bound	Upper Bound		
TPS	40	66.25	11.022	1.743	62.73	69.77	50	90
STAD	40	64.50	9.044	1.430	61.61	67.39	50	80
Total	80	65.38	10.056	1.124	63.14	67.61	50	90

The averages and standard deviations for the Geography concepts performance scores are shown in Table 1. TPS had a sample mean of 66.25 (SD=11.022), which was considerably higher than the STAD's 64.50 (SD=9.044). The average difference in favor of the TPS was 1.79. The TPS's 95 percent confidence interval for the difference in geography concepts mean was 62.73 to 69.77, whereas the STAD's was 61.61 to 67.39. TPS received a maximum score of 90 percent, which was greater than STAD's score of 80 percent. This demonstrates that in Kano State, the think pair share strategy

outperforms the team achievement division method in terms of secondary school pupils' performance in geography topics.

The influence of the think pair share method on the performance of male and female secondary school students in geography is the second research question.

Table 2 shows the averages and standard deviations of male and female secondary school students who were taught geography with TPS.

Table 2: Means and standard deviations of male and female secondary school students taught geography using TPS

Gender	N	Mean	Std. Deviation	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Male	40	67.00	10.908	-1.364	-5.641	2.914
Female	55	68.36	9.956			
Total	95					

The averages and standard deviations for the Geography concepts performance scores are shown in Table 2. Male students had a sample mean of 67.00 (SD=10.908), while female students had a sample mean of 68.36 (SD=9.956). The average difference in favor of female pupils was -1.364. For the geography concepts mean, the 95 percent confidence interval for the difference varied from -5.641 to 2.914. This

demonstrates how the think pair share strategy affects the performance of male and female secondary school students in Kano State in geography concepts.

What is the interaction effect of students' team achievement division strategy on the performance of male and female secondary school students in Geography, according to research question three?

Table 3 shows the averages and standard deviations of male and female secondary school students who took STAD geography classes

Gender	N	Mean	Std. Deviation	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Male	47	65.32	9.747	2.611	-1.053	6.275
Female	48	62.71	8.184			
Total	95					

The means and standard deviations for the Geography concepts performance scores are shown in Table 3. Male students had a sample mean of 65.32 (SD=9.747), while female students had a sample mean of 62.71 (SD=8.184). The average difference in favor of male students was 2.611. For the geography concepts mean, the 95 percent confidence interval for the difference ranged from -1.053 to 6.275. This shows that students' team achievement division strategy affects male and female secondary school students' performance in geography concepts in Kano State.

Testing of Null Hypotheses

The findings of the analysis utilizing inferential statistics such as one-sample t-test, independent samples t-test, and one-way ANCOVA are shown in this section. The following null hypotheses were proposed in the study and assessed at a significance level of 0.05.

Null Hypothesis One: There is no significant difference in secondary school students' Geography performance when they are exposed to Think-Pair-Strategy (TPS) and Students' Team Achievement Division (STAD) techniques.

Table 4: Analysis of covariance on secondary school students' geography performance using TPS and STAD Between-Subjects Effects Tests

Dependent Variable: posttest						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	10751.738 ^a	2	5375.869	141.590	.000	.604
Intercept	64710.706	1	64710.706	1704.356	.000	.902
Pretest	10155.215	1	10155.215	267.469	.000	.590
Strategy	119.727	1	119.727	3.153	.077	.017
Error	7062.019	186	37.968			
Total	835300.000	189				
Corrected Total	17813.757	188				

a. R Squared = .604 (Adjusted R Squared = .599)

The effectiveness of two distinct interventions on secondary school students' performance in Geography was compared using a one-way between-groups analysis of covariance. The kind of intervention (TPS, STAD) was the independent variable, and the results on the Geography Performance Test performed following the intervention were the dependent variable. The covariate in this analysis was students' scores on the Geography Performance Test pre-test administration.

Preliminary tests were performed to ensure that the normality, linearity, homogeneity of variances, homogeneity of regression slopes, and trustworthy measurement of the covariate assumptions were not violated. After controlling for pre-test scores, there was no significant change in post-test scores on the Geography Performance Test between the two intervention groups, $F(1,186) = 3.153, p = 0.077$, partial eta squared = 0.017. A partial eta squared value of 0.017 suggested a substantial association between the pre-test and post-test scores on the Geography Performance Test. As a result, the null hypothesis that there is no significant difference in secondary school students' Geography performance when they are exposed to Think-Pair-Strategy (TPS) and Students' Team Achievement Division (STAD) methods was not rejected.

The Null hypothesis Two

When secondary school pupils are taught geography utilizing the Think Pair Share instructional technique, there is no substantial change in their performance.

Table 5: Independent-sample t-tests of male and female secondary school pupils' geography performance using TPS

Gender	N	Mean	Std. Deviation	T	df	P
Male	40	67.00	10.908	-	93	.528
Female	55	68.36	9.956			
Total	95					

Table 5 shows the averages and standard deviations of the Geography concepts performance scores, as well as the independent samples t-test. The male students had a higher

mean score of (67.00, SD=10.908) than the female students (68.36, SD=9.956). The average difference in favor of female pupils was -1.364. For the geography concepts mean, the 95 percent confidence interval for the difference varied from -5.641 to 2.914. This is corroborated by $t(93) = -0.633, p=0.528$, indicating that the null hypothesis of no significant difference was not rejected. As a result, there is no significant influence of the think pair share technique on the performance of male and female secondary school pupils in Kano State in geography concepts. This demonstrates that the think pair share technique does not affect the performance of male and female secondary school pupils in Kano State in geography concepts.

Null Hypothesis 3

When exposed to the Pupils Team Achievement Division instructional technique, there is no significant difference in geography performance between male and female secondary school students.

Table 6: Independent-sample t-tests of male and female secondary school students' geography performance using STAD

Gender	N	Mean	Std. Deviation	T	df	p
Male	47	65.32	9.747	1.415	93	.160
Female	48	62.71	8.184			
Total	95					

Table 6 shows the averages and standard deviations of the Geography concepts performance scores, as well as the independent samples t-test. Male students had a considerably higher model mean (65.32 SD=9.747) than female students (62.71 SD=8.184). The average gap in favor of male pupils was 2.611. For the geography concepts mean, the 95 percent confidence interval for the difference varied from -1.053 to 6.275. The null hypothesis, which indicated that no significant difference existed, was retained with $t(93)=1.415, p=0.160$. As a result, there was no evidence of a significant influence of students' team achievement division strategy on male and female secondary school students' performance in geography concepts in Kano State. This demonstrates that in Kano State,

male and female secondary school pupils' performance in geography concepts is unaffected by their team achievement division method.

III. DISCUSSION

This study was specifically designed to investigate the extent to which two unique teaching and learning techniques, Think-Pair-Share and Students Team Achievement Division tactics, can aid in improving secondary students' geography performance. The outcomes of this study have been reviewed based on this premise to determine the relevance of the effects of the two teaching styles. Secondary school students' performance in geography was found to be improved by the two strategies of Think Pair Share and the Students' Team Achievement Division. Johnson and Johnson (2002) found that the Think-Pair-Share technique had a significant impact on Secondary School Students' performance. Another possible explanation, according to Donnell (2002), is that the TPS instructional method promotes social interaction, which is important for learning because higher mental functions like reasoning, comprehension, and critical thinking emerge from social interactions and are then internalized by individuals. As a result, cooperative education based on TPS provides the social support and scaffolding that students require to progress in their learning. He concluded that it is an extremely successful method of instruction.

According to the findings, the Think Pair Share Strategy has no gender implications on secondary school students' geography achievement. Gaith (2003), Gunters, Esther, and Schwab (2009), Ifemuyiwa and Onakoya (2012), Mbacho and Johnson (2013), Krol, Jansen, Veenman, and Linden (2014), Olowoyeye and Ogunlade (2015) found that the think pair share strategy helped secondary school students learn more effectively, boosting their performance in English, Chemistry, and Mathematics, regardless of gender. Furthermore, Johnson and Johnson (2005) stated that the think pair share technique helped students achieve better academic, social, and psychological outcomes at all levels of school, regardless of gender. This is in contrast to Sheehy (2004), who said that during cooperative learning class, binary tensions developed within three general components of collaborative learning: the environment, the group members, and the individual and that their performance was inadequate. VanDat and Ramon (2014), on the other hand, claimed that students are under pressure to offer an idea or finish a task to their group's activities. Similarly, Anjali (2012) asserted that traditional techniques have a greater impact on student's performance than cooperative learning alternatives.

The study found no difference in performance between female and male secondary school students who were taught geography concepts utilizing both think duo share and student team success division strategies. The findings are consistent with those of Olagunjo (2009), who found that gender-friendly instructional approaches that allow girls to participate improve their performance. Baker and Clerk (2010) found that when students were given the same teaching technique, there

was no statistically significant variation in their performance related to gender. TPS-based strategy

IV. CONCLUSION

The findings of this study show that Think Pair Share (TPS) and Student Teams Achievement Division (STAD) are equally beneficial in improving students' performance in Kano State's geography concept. Furthermore, there are no gender differences between the two techniques. As a result, teaching and learning strategies that interest pupils can keep students engaged and preserve their curiosity, resulting in improved performance in a variety of topics.

V. RECOMMENDATIONS

The study looked at the impacts of the Think pair share strategy (TPS) and the Student team achievement division strategy (STAD) on secondary school students' performance in Kano State's geography concept. Based on the outcomes of this study, it is currently recommended that teachers make the following changes:

Think-Pair-Share tactics should be used in the geography classroom by practical geography teachers, as they are key aspects of their teaching approach.

- i. Given the findings relating to treatment (i.e., the usage of TPS and STAD) and gender, which showed no interaction impact, it is suggested that additional efforts be made to popularize the methods for use among students.
- ii. To address the issue of slow learners, these tactics may be beneficial since they cooperate and hold students accountable for one other's achievement.

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