Effects of discussion instructional strategy on achievement and retention of secondary school students in human geography in minna, Nigeria

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Abstract Geography is a diverse science or social science discipline that involves the investigation of man and its physical surroundings. Numerous reasons have been identified to have caused the poor performance of secondary school students in geography among which the use of appropriate instructional strategies or teaching methods is paramount. The study investigated the effectiveness of using discussion method on students' achievement and retention in geography. The study adopted experimental research design. The sample for the study consisted of sixty (60) Senior Secondary School Class II students. The students selected were randomly assigned to experimental and control groups of thirty (30) students each. The instrument used for the study is the Geography Achievement Test (GAT) designed by the researcher. Two hypotheses were formulated and tested at 0.05 alpha level of significance. The data were analyzed using t-test statistics. The result indicated that there was no significant different between the pretest scores of control and experimental group ($t_{(58)}=0.217$, $p=0.829>0.05$). There was significant difference between the mean achievement scores of control and experimental group ($t_{(58)}=-6.532$, $p=0.000<0.05$) in favour of those taught using discussion method. Also, there was significant difference in the mean retention scores of control and experimental group ($t_{(58)}=-7.079$, $p=0.000<0.05$) in favour of those taught using discussion method. It was therefore concluded that discussion method is more effective in improving students' achievement and retention in geography than the conventional lecture method. It is therefore recommended among others that teachers should be encouraged to employ the use of discussion method in the teaching of human geography.

Keywords Achievement, Discussion, Method, Geography

Introduction
Geography as a field of study enables us to comprehend the universe in which we live from different perspectives. It allows a logical framework for investigations into different questions about the environment. It bridges the gap between the physical and social sciences by providing an understanding of different societies, cultures, economies as well as those physical landscapes and different environmental processes. Geography as a field of study is divided into two major field which are physical and human geography. Other minor fields are: regional geography, integrated geography, geomatics, etc [1].

Physical geography is aimed at understanding the physical characteristics of the environment such as the atmosphere, lithosphere, hydrosphere and biosphere. On the other hand, human geography focused on the different patterns and processes that shape the human environment. Human geography comprises of human, cultural, economic, social and political aspects of the environment. The main difference between physical and human geography is that human geography focus more on human activities and it is more prone to the use of qualitative research methodologies in researches [2].

Geography is a standout amongst the most imperative subject in senior secondary school instruction. It is essential for students who are liable to proceed to the tertiary level of instruction and the individuals who are most certainly not. It furnishes the student with the oblige group of learning required to make them utilitarian and socially applicable in the environment. Geography is a diverse science or social science discipline that involves the investigation of man and its physical surroundings. It helps the student to admire the value of their surroundings and its enormous resources. Geography is flexible, expressive and mentally stimulating as a secondary school subject. It rouses in the student the need to acknowledge and create a feeling of commitment towards the nature. It incorporates different subjects in the social sciences and natural sciences. It requires hard work to master the subject at the secondary school level, however with proper mentality and right approach, it is generally a pleasure and ease to learn. In any case, at the secondary school level, geography has witnessed a decline in the number of students that offers it especially in Nigeria. Thusly, it is paramount that senior secondary school geography educator ought to be scholastically sound in his general vicinity of specialization. The way or method in which the teacher passes his instruction to the students goes far to influence understudies' interest, reaction, and demeanor towards the subject [3].

The determination of fitting instructional strategy guarantees the accomplishment of the expressed instructional goal viably. Instructional methods are utilized as a part of the presentation of the lesson to help the students learn by ensuring the smooth conveyance of guideline. It is a system by which an instructional unit, instructional stage or an entire course is conveyed [4]. Teaching method is the technique in which an educator conveys his or her topic to students, taking into account pre-stated goals, to promote learning. Several teaching methods have been surveyed by researchers to replace the commonly known conventional lecture method in order to improve the quality of instruction as well as the academic performance of the learner [4]. It has additionally been noted that traditional method is the most commonly used method utilized as a part of senior auxiliary school in Nigerian schools and the system have been discovered not to be so effective on the grounds that students are not given the chance to communicate with the nature's domain and their scholarly abilities are not maximally developed. On the other hand, discussion method of teaching is the system in which the instructor leads or aides the students in conveying their assessments and thoughts with a perspective to perceive and resolution of issues aggregately. It deals with the premise standard that the learning and thoughts of distinctive individuals are more inclined to discover clarifications or responses to specific difficulties and areas. This approves the truism that "Two great heads are superior to one" [5]. Also, blended learning is a formal education program in which a student learns at least in part through delivery of content and instruction via digital and online media with some element of students' control over time, place path or space [6].

Academic achievement is the result of instruction, that is, the degree to which a student, instructor or establishment has accomplished their instructional objectives. It is regularly measured by examinations or continuous valuation in which there is no agreement concession to how it is best tried or which view points are most essential [7]. The teacher or evaluator is also the only person in the pole position to determine either a performance is to be regarded as good or poor performance. While retention in learning is the ability of the learner to retain facts in memory, it deals with how well a learner can retain facts he/she has learnt over a long period of time.

There are various empirical studies on the use of different teaching methods in teaching and learning. Omoro and Nato (2014) conducted research on "determining methods used in teaching geography in secondary schools" and the study indicated that the use of question and answer methods by teachers is at 85.3% while the use of field work by teachers is at 56.2% [8]. Elvis (2013) also conducted a research on "teaching methods and students' academic performance" and the findings shows that teacher-student interactive method was the most effective teaching method followed by student-centered method while the teacher centered approach was the least effective teaching method [9]. The findings of Abdu Raheem (2011) on "effects of discussion method on achievement and retention in secondary school students in social studies" revealed that discussion method was superior over the traditional method in enhancing students' achievement and retention in social studies [5]. Abdulhamid (2010) conducted research on "effects of two teaching methods on secondary school students' agricultural science performance" and the findings revealed though both demonstration and discussion method

have noteworthy impact on student's performance in agricultural science, however, demonstration method was found to be more viable than the discussion method [10].

Statement of the Problem

The poor performance of students in geography has caused a lot of concerns to the stakeholders and students of geography in particular. It has also been perceived that the poor performance in the subject has also triggered fear in some students, resulting in some students deciding not to register the subject in external examinations. The volume or bulkiness of geography study has led to the development of a negative attitude to the study of geography. Between 2008 and 2013, 149,320 students sat for geography in the SSCE (June/July) exams in Niger State. 52,292 students which represent about 35% of the students pass the exam having grades between A1-C6, while 97,028 students which represent about 65% fail the exam having grades between D7-F9. This is very poor for a state like Niger state striving towards self-development and technological advancement [11].

Performance of students in Geography in Niger State, SSCE 2008-2013 (June/July)

Year	Number of Candidates	% of pass	% of failure
2008	20,188	70.20	29.79
2009	21,806	18.97	73.55
2010	22,598	15.69	74.78
2011	29,455	18.91	79.37
2012	32,376	36.86	61.19
2013	29837	46.43	53.43

Source: National Examinations Council (NECO) Headquarters, Minna [11].

Purpose of the Study

The purpose of the study is to examine the effectiveness of discussion method of teaching in a blended learning setting with the aim of determining the effects of the method on the academic achievement and retention of geography students in Senior Secondary School in Minna, Nigeria.

In order to achieve this aim, the following objectives are to be focused on:

i.   To examine the effects of discussion method of teaching on the achievement of geography students in Minna, Nigeria.

ii.   To examine the retention capabilities of students taught with discussion method of teaching.

Research Questions

In order to guide the study, the following research questions were formulated:

i.   Do discussion method of teaching affects the academic achievement of secondary school students?

ii.   Is there any difference in the retention scores of secondary school students taught using discussion method?

Research Hypotheses

The following research null hypotheses were formulated to guide the research:

Ho₁: There is no significant difference in the mean achievement scores of students taught with discussion method of teaching and those taught with conventional lecture method.

Ho₂: There is no significant difference in the mean retention scores of secondary school students taught using discussion method and those taught with conventional lecture method.

Methodology

The research design adopted for this research is an experimental design. Two (2) groups were randomly selected for the pretest, post-test design. The experimental groups were taught using discussion method and the control groups were taught using conventional lecture method.

The targeted population comprises of all senior secondary school two (SS II) geography students in Minna, Nigeria. Simple Random Sampling technique was adopted for the study. Out of the 25 public senior secondary schools in Minna, two (2) secondary schools were selected for the study. The schools were selected because of their co-educational background and availability of equipment used for the study. Thirty (30) students were randomly selected from each school chosen for the study making a total of sixty (60) students. The chosen students were randomly assigned into experimental groups and control groups of thirty (30) students each.

The instrument used for data collection was Geography Achievement Test (GAT). The test items used covered the topic the students were taught in the class using both method of instruction. The test item used was adopted from West African Examination Council (WAEC) past examination questions and from relevant textbooks used in teaching geography. Twenty (20) multiple choice test questions were set on the topic taught with four option (A-D) in which there is only one correct answer. Students were required to answer all questions and all questions carry equal marks. Right respond to a question will earn five (5) marks while wrong answer will earn zero (0) mark.

The instrument used for data collection was validated by three (3) geography lecturers at Federal University of Technology, Minna. The school used for establishing the reliability of the instrument was taken outside the sample study. Reliability of the instrument was determined using the test-retest reliability method. The test was first administered to a group of ten (10) students who were randomly selected. After two weeks, the test was re-administered on the same group of students. The result of the two tests was collated and compared to determine the reliability of the instrument. The scores of the two sets were correlated using Pearson Product Moment Correlation Coefficient Analysis in which correlation coefficient of $r=0.83$ was obtained. The reliability coefficient shows that the test instrument is consistent and reliable.

Results

Statistical Package for Social Sciences (SPSS) version 20.0 was used to analyze the data obtained. The pretest, posttest and retention scores collated were analyzed using mean, standard deviation and student's t-test statistics.

Research Question I: Do discussion method of teaching affects the academic performance of secondary school students?

Table 1: Mean Score of Achievement Scores of the Two Groups

Variable	N	Mean	Std. Dev.
Control Group	30	60.58	8.41
Experimental Group	30	79.23	11.89

Table 1 shows that the experimental group has higher mean score (79.23) and standard deviation (11.89) than the mean score (60.58) and standard deviation (8.41) of the control group.

Research Question II: Is there any difference in the retention scores of secondary school students taught using discussion method?

Table 2: Mean Score of Retention Scores of the Two Groups

Variable	N	Mean	Std. Dev.
Control Group	30	52.88	7.24
Experimental Group	30	68.46	8.58

Table 2 shows that the experimental group has higher mean score (68.46) and standard deviation (8.58) than the mean score (52.88) and standard deviation (7.24) of the control group after the delayed posttest.

Table 3: t-test Pre-test Analysis for the Experimental and the Control Groups

Variable	N	X	SD	df	t	p-value	Decision
Control Group	30	27.12	13.28				
				58	0.217	0.829	Not significant
Experimental Group	30	26.35	12.29				

Note: P>0.05

Table 3 shows the pretest analysis for the experimental and control groups. The control group has a mean score of 27.12 with a standard deviation of 13.28 while the experimental group has a mean score of 26.35 with a standard deviation of 12.29. The computed t-value at t (58) = 0.217 was not significant at 0.05 alpha level of significance. This indicates there was no significant difference between the pretest scores of the control and experimental group (t (58)=0.217, p>0.05). Thus, the two groups were considered equivalent in terms of their entry behavior.

Hypothesis I: There is no significant difference in the mean achievement scores of students taught with discussion method of teaching and those taught with conventional lecture method.

Table 4: t-test Comparison of the Achievement Scores for the Experimental and the Control Groups

Variable	N	X	SD	df	t	p-value	Decision
Control Group	30	60.58	8.41				
				58	-6.532	0.000	Significant
Experimental Group	30	79.23	11.89				

Note: P<0.05

Table 4 shows the achievement scores of the control and experimental groups. The control group has a mean score of 60.58 with a standard deviation of 8.41 while the experimental group has a mean score of 79.23 with a standard deviation of 11.89. The computed t-value at t(58)=-6.532 was significant at 0.05 alpha level of significance. This indicates there was significant difference in the mean achievement scores of students taught with discussion method of teaching of teaching and those taught with conventional lecture method in favour of those taught with discussion method (t (58)= -6.532, p<0.05). Thus, we rejected the null hypothesis.

Hypothesis II: There is no significant difference in the mean retention scores of secondary school students taught using discussion method and those taught with conventional lecture method.

Table 5: T-test Comparison of the Retention Scores for the Experimental and the Control Groups

Variable	N	X	SD	df	T	p-value	Decision
Control Group	30	52.88	7.24				
				58	-7.079	0.000	Significant
Experimental Group	30	68.46	8.58				

Note: P<0.05

Table 5 shows the retention scores of the control and experimental groups. The control group has a mean score of 52.88 with a standard deviation of 7.24 while the experimental group has a mean score of 68.46 with a standard deviation of 8.58. The computed t-value at t(58) = -7.079 was significant at 0.05 alpha level of significance. This indicates there was significant difference in the mean academic retention scores of students taught with discussion method of teaching of teaching and those taught with conventional lecture method in favour of those taught with discussion method (t (58)= -7.079, p<0.05). Thus, we rejected the null hypothesis.

Discussion of Results
The pretest scores in table 3 show that the control group (mean of 27.12 and standard deviation of 13.28) and experimental group (mean of 26.35 and standard deviation of 12.29) are equivalent (p=0.829 greater than 0.05 alpha level) in terms of their previous knowledge before the application of the treatment.

Hypothesis I: There is no significant difference in the mean achievement scores of students taught with discussion method of teaching and those taught with conventional lecture method.
Table 1 shows that the experimental group has a higher mean score (79.23) and standard deviation (11.89) than the mean score (60.58) and standard deviation (8.41) of the control group after the treatment. The result of the t-test as shown in table 4 shows that the computed t-value at t(58) = -6.532 while the p-value (0.000) is less than the 0.05 alpha level of significance. The results show that the experimental group performed significantly better

than the control group. This means that discussion method enhances learning of human geography concept than the conventional lecture method at the secondary school level in Geography. This result was in line with the findings of Abdu Raheem (2011) who reported that discussion method was better than the conventional lecture method in improving student's achievement and retention in social studies.

HO$_2$: There is no significant difference in the mean retention scores of secondary school students taught using discussion method and those taught with conventional lecture method.

Table 2 shows that the experimental group has higher mean score (68.46) and standard deviation (8.58) than the mean score (52.88) and standard deviation (7.24) of the control group after the retention test. Table 5 shows the retention scores of the control and experimental groups. This shows that the computed t-value at t(58) = -7.079 while the p-value (0.000) is less than the 0.05 alpha level of significance. This indicated that the students taught with discussion method performed significantly better than the students taught with the conventional lecture method in terms of retention. This means that discussion method can help to facilitate learning retention more than the conventional lecture method which is also in line with the findings of Abdu Raheem, (2011).

Conclusion

Based on the research findings as related to the hypotheses formulated and tested, the following conclusions were made:

- Exposing students to discuss method will help to improve the performance of students in human geography.
- Exposing students to discuss method will also enhance retention capabilities of the students.

It was concluded that out of the two method of teaching compared, discussion method has the higher tendency to influence to increase students' academic achievement in Human Geography.

Recommendations

On the basis of the research findings, the following recommendations were made for the study:

- Since the use of discussion method enhances students' performance, teachers should be encouraged to employ the use of discussion method in teaching of human geography.
- Secondary school principals should encourage and give needed assistance to teachers for effective use of discussion method in teaching and learning.
- The government supervisory agencies should also inspire and necessitate geography instructors to use discussion method through management and providing of conducive setting for the teaching and learning of human geography using discussion method.
- The government should also establish in-service training, symposia, workshops, conferences and seminars for the secondary school teachers on the selection and application of proper teaching method in teaching geography.
- Educational planners should also use the results of the research to find out more appropriate teaching methods to be use in teaching and learning about the various aspects of geography in senior secondary school.
- Teacher should consider factors such as previous knowledge, duration of lesson, size of the class, available resources, number of students, teacher's effectiveness etc. before selecting teaching method to be used in teaching and learning.

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