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COMPARATIVE IMPACTS OF DISCUSSION AND
PROBLEM-SOLVING METHODS ON SECONDARY SCHOOL
STUDENTS' ACHIEVEMENT AND RETENTION IN SOCIAL
STUDIES, IN EKITI STATE, NIGERIA

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Abstract

This study investigated the comparative impacts of discussion and problem-solving methods of teaching on secondary school students' achievement and retention in Social Studies. The study adopted the quasi-experimental, pre-test, post-test, control group design. The sample for the study consisted of 360 Junior Secondary School Class II students selected from nine secondary schools in Ekiti State, Nigeria. Simple random sampling was used to select 40 students from each school. The instrument used for the study is the Social Studies Achievement Test (SSAT) designed and validated by the researcher and experts. The instrument was made up of 40 multiple-choice items designed to measure the students' achievement and retention in Social Studies. The test-re-test and internal consistency methods of reliability were adopted and the reliability co-efficient of 0.73 and 0.71 were obtained respectively. Four hypotheses were raised and tested at 0.05 level of significance. The data were analyzed using t-test, ANOVA and ANCOVA statistical tools. The results showed that there is a significant difference between the achievement mean scores of students in the experimental and control groups. There is a significant difference between the retention mean scores of students in the experimental and control groups. There is a significant difference between the pre-test and achievement mean scores of students in the experimental and

control groups. There is a significant difference between the achievement mean scores and the retention mean scores of students in the experimental and control groups. It was discovered in the study that problem-solving method is the best, more appropriate and more rewarding. Discussion method is also better than conventional lecture method in improving students' achievement and retention in Social Studies. It was therefore recommended that teachers should be more alive with their jobs and make their lessons practical and more interesting. Government should also emphasize the use of discussion and problem-solving methods to teach Social Studies in secondary schools.

Key Words: Discussion, Problem-Solving, Comparative Impact, Students' Achievement, Retention, Social Studies, Ekiti State, Nigeria.

Introduction

Observations show that many teachers still rely heavily on the traditional lecture method in teaching Social Studies in Nigerian Secondary Schools. In the lecture method, the teacher uses verbal explanations throughout the lesson and renders the students passive. The students may not contribute to the lesson in any form. All they need is to memorize the teacher's note for the purpose of passing examinations. Based on the philosophy of education in Nigeria, the ultimate aim of Secondary School education is to transform the individual into a sound and effective citizen (FGN, NPE, 2004). In the light of the facts stated above, there are indications that the lecture method of teaching has not been effective enough to enhance the achievement of students in Social Studies. It does not enable them to develop initiatives to discover, identify and attempt solutions to social problems cropping up around them. The writer therefore explored the possibility of using discussion and problem-solving methods as a way of providing alternatives to the lecture method

of resource persons, library search and other creative activities (Adewuya, 2003). Yewande (2000) also believed that problem-solving is using information and reasoning to overcome obstacles and barrier. and being able to solve problems, adapt to and modify the environment for ones good. (Serrano, Cantu and Vila, 2003). In his own study, Orimogunje (2008) emphasized the need for using an innovative strategy such as problem-solving to correct the mismatch of post-primary Social Studies with the traditional lecture method. In support of the above idea, Bandele (2003) confirmed that the health of classroom interaction is dictated by the quality of instructions given during the actual lesson periods. Sotonwa (2003) explained that good teaching matters in raising the standard of education and the achievement of students. Ekanola (2007) stressed that problem-solving is designed to facilitate both knowledge acquisition and utilization.

Discussion is a method of teaching Social Studies in Nigeria. It works on the principle that many people are to put heads together in terms of knowledge and ideas to find solutions to specified problems. The activities of the discussion group are to be regulated and directed by the teacher or an appointee of the class. Group discussion may take a variety of forms such as small group, devil's advocate, round table, panel discussion, opposing panel and debate (Adewuya, 2003). Some of the advantages of the method are sharing of ideas by students, development of social skills of talking and listening, clarification of ideas and promotion of team work. Despite all the above mentioned advantages, the demerits are numerous. Discussion can get out of hand if not properly controlled, the class may turn to a market place and confusion may arise as a result of poor management and informal nature of the organization.

According to Stephens and Stephens (2005), discussion as a process of giving and talking, speaking and listening, describing and witnessing which helps expand horizons and foster mutual understanding. They explained further that it is only through discussion that one can be exposed to new points of view and exposure increases understanding and renews motivation to continue learning. Abdu-Raheem (2011) recommended that as a

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use discussion method of teaching to promote knowledge in secondary school students.

In their contributions, Iyamu and Otote (2007) confirmed that problem-solving is a whole complex of instructional phenomenon in which the teacher makes use of a variety of methods and activities that encourage students' active involvement in the generation of their own knowledge. Mann (2001) also agreed that it is essential to develop awareness in the students that they themselves have the reason why a solution is not being found to a particular problem. He pointed out that if the teacher moves from a problem towards a solution, the students will be in the dark until the last moment. Ayeni (2007) reported that problem-solving approach is used to identify particular issues and raises questions on them, hypothesizing possibilities and seeking evidence to establish facts in educational research.

In support of the above ideas, Hermann (2007) recommended brainstorming or mind-storming at the first stage of problem-solving, even before defining the problem. He explained further that brainstorming requires using the creative hemisphere of one's brain before the logical hemisphere takes over. Mistry, White & Berardi (2006) concluded that the area of problem-solving skills is considered a high priority skill area, even in post-graduate studies development. According to Douglas and Kristin (2000), students can learn both new concepts and skills while solving problems. Jimoh (2001) also supported the idea that problem-solving method develops students' interest in critical thinking and evaluative reasoning. Akinleye (2010) also noted that pupils must be put on the right part of problem-solving with understanding and insight. Seweje (2010) added that in learning generally, learners must interact with contents in order to construct their own meanings so as to integrate new knowledge into the existing cognitive structure. Abdu-Raheem (2012) concluded that if the steps required in the use of problem-solving method of teaching such as identification of problem, observation, and creativity, are properly utilized,

Statement of the problem

The problem of ineffective teaching and learning of Social Studies in Nigerian Secondary schools has become a burning issue that needs urgent attention. It has been observed that many students do not pass well in the Junior Secondary School Certificate Examinations in Social Studies. Abdu-Raheem (2010) confirmed that out of 3,186 students that sat for the examination in Ekiti State, only 856 passed at credit level in Social Studies. It has also been confirmed that among the factors responsible for the students' poor academic achievement in the subject is the inappropriate teaching method adopted by the teachers. Adewuya (2003) established that the rate of absorption of students is as low as 20-30% as a result of conventional lecture method used to teach them by teachers. This study therefore aims at investigating the comparative impact of discussion and problem-solving methods on students' achievement and retention in Social Studies.

Hypotheses

In an attempt to find solutions to the problem raised, the following hypotheses were formulated:

1. There is no significant difference between the achievement mean scores of students in the experimental and control groups.
2. There is no significant difference between the retention mean scores of students in the experimental and control groups.
3. There is no significant difference between the pre-test and achievement mean scores of students in the experimental and control groups.
4. There is no significant difference between the achievement mean scores and the retention mean scores of students in the experimental and control groups.

Method

The study adopted quasi-experimental, pre-test, post-test, control group, design. The population for this study comprised all Junior Secondary School students in Ekiti State.

School Class II students of Social Studies from schools sampled. Simple random sampling was used to select 40 students from each school. Simple random sampling was also used to assign the groups into experimental and control groups. The instrument consisted of 40 multiple-choice items used for pre-test, post-test and retention test on students sampled. The validity of the instrument was ascertained through face, content and validity procedures. The instrument was given to two test experts in Guidance and Counseling, two in Educational Management and two specialists in Social Studies. They were requested to find the face value and the appropriateness of the instrument in measuring the students' achievement and retention in Social Studies. The reliability of the instrument was ascertained through test-re-test method and estimation of internal consistency. The instrument was administered on 40 students from two schools that were not used for the study. After two weeks, the instrument was re-administered again on the same sets of students. The responses of the two sets of students were correlated using Pearson Product Moment Correlation Coefficient Analysis and the correlation coefficient of 0.73 was obtained. Crombach Alpha was also applied on the responses of 30 students from a school that was not used for the study for the estimation of internal consistency. The formula when applied yielded the reliability coefficient of 0.71 which is good enough to measure the differences between experimental and control groups when large samples are used.

The instrument was first administered on students by exposing all of them to pre-test to test their knowledge baseline in Social Studies. The students were randomly assigned to experimental and control groups. The experimental group was then exposed to treatment for six weeks while the control group was going on with their normal classroom conventional lecture method. The instrument was also administered on the experimental and control groups, to test their level of achievement. After six weeks, the instrument was administered again on both experimental and control groups to test their level of retention. The data collected were analyzed using ANOVA and ANCOVA statistical tools.

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Results and Discussion

Results

Hypothesis 1

There is no significant difference between the achievement mean scores of students in the experimental and control groups.

To determine the mean difference between the experimental and control groups, achievement scores of students were compared. The results are shown in Tables 1, 2 and 3 as follows.

Table 1: ANCOVA Summary of Achievement Mean Scores of Students in the Experimental and Control Groups.

Source	SS	DF	MS	F-cal	F-table	P
Corrected Model	36576.726	3	12192.242	1085.816	3.84	0.000
Intercept	27844.471	1	27844.471	2479.772	3.84	0.000
Covariate (pre-test)	140.687	1	140.687	12.529	3.84	0.000
Group	36390.726	2	18195.364	1620.442	3.00	0.000
Error	3997.397	356	11.229			
Corrected Total	40574.122	359				
Total	275992.000	360				

$P < 0.05$

Table 1 showed that F-cal (1620.442) is greater than F-table (3.00) at 0.05 level of significance. Therefore, the null hypothesis is rejected. Hence, there is a significant difference between the achievement mean scores of students in the experimental and control groups.

In order to determine the pair of groups that are significantly different from each other, Scheffe Post-Hoc analysis was used. The result is shown in Table 2 below.

Table 2: Scheffe Post-Hoc Analysis of Achievement Mean Scores of Students in the Experimental and Control Groups.

Group	Control	Discussion	Problem-Solving	X	N
Discussion	*			31.08	120
Problem-Solving	*	*		34.18	120

Table 2 revealed that there is significant difference between the achievement mean scores of students exposed to discussion method of teaching and those in control group in favour of discussion group. Similarly, the mean difference between problem-solving group and control group and between discussion and problem-solving groups is significant at 0.05 level in each case.

In order to provide some indications of the performances of the groups, a Multiple Classification Analysis (MCA) was computed. The results are presented in Table 3 as follows.

Table 3: Multiple Classification Analysis (MCA) of Achievement Mean Scores of Students in the Experimental and Control Groups.

Grand Mean = 9.33					
Variable + Category	N	Unadjusted Deviation	Eta	Adjusted for Independent + Covariate	Beta
Discussion	120	5.51		5.49	
Problem-Solving	120	8.61		8.63	0.068
Control	120	-14.11		-4.10	0.005
Multiple R ²					0.068
Multiple R					

$P < 0.05$

The Multiple Classification Analysis (MCA) table showed that students exposed to problem-solving method of teaching had the highest adjusted achievement mean score of 17.96 ($9.33 + 8.63$) followed by those in the discussion group with adjusted achievement mean score of 14.82 ($9.33 + 5.49$) while the students in the control group had the least adjusted achievement mean score of 5.23 [$9.33 + (-4.10)$]. This implies that problem-solving method of teaching had the potency of producing the best students' achievement in Social

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To test this hypothesis, the retention mean scores of students in the experimental and control groups were compared. The result is shown in Table 4 below.

Table 4: One-way Analysis of Variance (ANOVA) of Retention Mean Scores of Students in the Experimental and Control Groups.

Source	SS	Df	MS	F-cal	F-table
Between Groups	46000.572	2	23000.286	2408.949	3.00
Within Groups	3408.583	357	9.548		
Total	149409.156	359			

$P < 0.05$

Table 4 showed that F-cal (2408.949) is greater than F-table (3.00) at 0.05 level of significance. The null hypothesis is rejected. Therefore, there is significant difference between the retention mean scores of students in the experimental and control groups. In order to determine the sources of significant difference, Scheffe Post-Hoc test was applied. The result is shown in Table 5 as follows:

Table 5: Scheffe Post-Hoc Analysis of Retention Mean Scores of Students in the Experimental and Control Groups.

Group	Control	Discussion	Problem-solving	X	N
Discussion	*			30.40	120
Problem-Solving	*	*		32.71	120
Control				7.66	120

Table 5 showed that there is significant difference between the retention mean scores of students exposed to discussion method and those in the control group in favour of discussion. Similarly, there is significant difference between the retention mean scores of students exposed to problem-solving method and those in control group in favour of problem-solving. Also, there is a significant difference between the retention mean scores of students exposed to problem-solving and discussion methods.

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solving. Hence, it must be noted that there is a significant difference between the retention mean scores of students in the experimental and control groups.

Hypothesis 3

There is no significant difference between the pre-test and achievement mean scores of students in each of the experimental and control groups.

To test this hypothesis, pre-test and achievement mean scores were compared for each group. The results are shown in Table 6 below.

Table 6: t-test Summary of Pre-test and Achievement Mean Scores of Students in the Experimental and Control Groups.

Group	Variable	N	X	SD	Df	t-cal	t-table
Discussion	Pre-test	120	9.44	3.96	119		
	Achievement test	120	31.08	3.06		46.537	1.98
Problem-Solving	Pre-test	120	9.28	3.43	119	54.398	1.98
	Achievement test	120	34.18	3.41			
Control	Pre-test	120	9.27	3.67	119	7.353	1.98
	Achievement test	120	11.46	3.71			

$P < 0.05$

Table 6 showed that t-cal (Control = 7.353, Discussion = 46.537, Problem-Solving = 54.398) is greater than t-table (1.98) at 0.05 level of significance. The null hypothesis which states that there is no significant difference between the pre-test and achievement mean scores of students in experimental and control groups is rejected. Therefore, there is significant difference between the pre-test and achievement mean scores of students in each of the experimental and control groups.

Hypothesis 4

There is no significant difference between the achievement mean scores of students in both experimental

To test this hypothesis, the achievement mean scores and retention scores were compared for each group. The result is shown in Table 7 below.

Table 7: t-test Summary of Achievement Mean Scores and Retention Mean Scores of Students in the Experimental and Control Groups.

Group	Variable	N	X	SD	Df	t-cal	t-table
Discussion	Achievement Mean Scores	120	31.08	3.06			
	Retention Mean Scores	119	2.515	1.98			
Problem-Solving	Achievement Mean Scores	120	34.18	3.41	119	4.379	1.98
	Retention Mean Scores	120	32.71	3.26			
Control	Achievement Mean Scores	120	11.46	3.71	119	14.409	1.98
	Retention Mean Scores	120	7.66	2.85			

Table 7 shows that t-cal (Control = 14.409, Discussion = 2.515, Problem-solving = 4.379) is greater than t-table (1.98) at 0.05 level of significance in each case. Therefore, the null hypothesis is rejected. It implies that there is significant difference between the achievement mean scores and retention mean scores of students in each of the experimental and control groups.

Discussion

The result of this study revealed that the achievement level of students in Social Studies before the commencement of the different treatments...

is an indication that if students were allowed to participate actively in the class lessons as applicable in problem-solving and discussion methods, their level of achievement will improve generally. This is in line with the submission of Abdu-Raheem (2012) who confirmed that the use of problem-solving method is the solution to the dwindling performance of students in Social Studies. The author believed that active participation of students in the class lessons will go a long way to improve students' achievement and retention in Social Studies.

The study of Abdu-Raheem (2011) also discovered that discussion method has the potency to improve the students' achievement in Social Studies. She confirmed that discussion method is better than conventional lecture method currently used to teach Social studies in Secondary Schools. The study also discovered that there is significant difference between the achievement mean scores and retention mean scores of students in the experimental and control groups. This is in agreement with Owuamanam and Owuamanam (2004) who noted that forgetting occurs during retention intervals when the information in question is not used.

Conclusion

Finally, it could be concluded that out of the methods tested, problem-solving has the best potency to improve the students' achievement in Social Studies. It was also noted in the study that discussion method is better than conventional lecture method in improving students' achievement and retention in Social Studies.

Recommendations

Based on the findings, it is recommended this study wishes to recommend that the government should emphasize the use of discussion and problem-solving methods to teach Social Studies in secondary schools. The government should also organize on-the-job training, workshops, seminars and conferences for teachers of Social Studies on effective use of discussion and problem-solving methods of teaching. Lastly, the teachers should consider a shift of conventional lecture method to

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