



Effects of cooperative learning and problem-solving strategies on Junior Secondary School Students' Achievement in Social Studies

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Abstract

Introduction. There is no doubt, Social Studies as a course of discipline that gained its entrance in Nigeria School Curriculum shortly after its independence, precisely, 1963 is at its infancy. A discipline of such nature that came when there was eagerness for a course of study that could assist in understanding and finding solutions to the problems confronting society needed to be improved in the quality of what is to be taught from time to time to students. Hence, there is need to keep abreast of the day to day strategies of imparting facts and ideas to students. The paper therefore investigated the effects of three teaching strategies (Cooperative learning, problem-solving and conventional) on junior secondary school students' achievement in Social Studies.

Method. The design used for the study was pre-test, post-test control group non randomized quasi-experimental design. The study made use of 150 students (80 boys and 70 girls) that were selected using stratified cluster sampling from three public secondary schools in Ife Central Local Government Area of Osun State, Nigeria. In addition, based on the design, the teaching strategies were crossed with gender.

Results. The results showed that students exposed to cooperative learning strategy performed better than their counterparts in the other groups. The results of the study also indicated that the effect of teaching strategies was gender sensitive.

Discussion or Conclusion. The findings of the study are highly significant and relevant. These results have implications for curriculum planning, teacher training and retraining programme and classroom practice.

Key words: Cooperative learning, problem solving, learning strategies, gender, Social Studies Achievements.

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Resumen

Introducción. Sin ninguna duda, la disciplina de Estudios Sociales se incluyó en el currículum escolar de Nigeria poco después de la independencia, dando los primeros pasos en 1963. Una disciplina de tal naturaleza apareció por el afán de tener un curso que pudiera ayudar a la comprensión y búsqueda de soluciones para los problemas de confrontación en una sociedad que necesitaba incrementar la calidad de la enseñanza para los estudiantes. Así pues, es necesario aunar técnicas y estrategias para transmitir los contenidos de la misma. El artículo investiga los efectos que tres estilos de docencia (aprendizaje cooperativo, resolución de problemas y enseñanza convencional) tienen sobre el rendimiento de estudiantes de educación secundaria en dicha disciplina.

Método. El diseño de la investigación se corresponde con un diseño pretest-postest con grupos no equivalentes de carácter cuasi-experimental. Participaron 150 estudiantes (80 hombres y 70 mujeres) que forman parte de una muestra estratificada correspondiente a tres centros de Osun State, Nigeria. Además, y basado en el diseño, los estilos de docencia fueron cruzados con el género.

Resultados. Los resultados muestran que los estudiantes expuestos a estrategias de aprendizaje cooperativo tenían mejores rendimientos que los compañeros de otros grupos. Los resultados también indican el efecto de las estrategias de docencia en función del género de los estudiantes.

Discusión y Conclusiones. Los resultados del estudio son significativos y relevantes. Estos resultados han tenido implicaciones en la planificación curricular, la formación del profesorado, cursos de formación continua y práctica en el aula.

Palabras Clave: aprendizaje cooperativo, resolución de problemas, estrategias de aprendizaje, género, rendimiento en Estudios Sociales.

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Introduction

Social Studies as a discipline is a subject approach discipline through which man learn about the problem of survival. In order for Social Studies to perform its function properly, instructional strategies in Social Studies must be centered on methods of seeking the truth which include those of problems detecting, problem solving, learning by experimenting and discovery learning. A competent teacher of Social Studies must acquaint himself or herself with Social Studies methodology and be well groomed in the application of the various methods of teaching Social Studies. A good Social Studies teacher has to convince himself that he is committed to, interested in and enjoys teaching Social Studies. Of great concern to the investigator is that Social Studies teachers use mostly the lecture method for imparting information, under the lecture approach, the teacher, according to Fenton (1967), Bruner (1969), Berliner (1975) simply becomes only the expositor and drill master while the learner remains the listener and a storehouse of facts that can be retrieved when a student hears his name called by the teacher.

The search for an appropriate mode of instruction within the context of Nigeria's Philosophy of Education which is based on the *integration of individual into a sound and effective citizen*. FRN, National Policy on Education (Revised 2004, section 1) has a lot of implications. One that specifically relates to the secondary school level aims states inter-alia:

- (i) equipping students to live effectively in our modern age of science and technology; and
- (ii) raising a generation of people who can think for themselves, respect the views and feelings of others and live as good citizens.

It was in pursuance of the attainment of these lofty aims and objectives that Social Studies, an inter-disciplinary subject, emerge about forty three years ago on the curricula of Nigerian Primary, Secondary Schools and Teachers' College. Not only that, the problem of students under achievement in Social Studies has been an educational issue since the early 80's (Adaralegbe, 1980; Adeyemi, 2003; Falade 2001; Mansaray 1991;

Orimoloye, 1984). Prominent among the factors which have been identified as contributing to the persistent low interest and poor level of achievement in Social Studies are: poor teaching methods adopted by Social Studies teachers (Adaralegbe, 1980; Adeyemi 2003; Mansaray 1991; Ogundare 2000) the predominant use of text and lecture instructional strategy by Social Studies teachers (McDonnell, 1988); learner variables such as gender and home background (Ogunsanya 1984; Mansaray 1987); lack of organized strategies for concept formation, teacher characteristics and memory skills (McDonnell, 1988; Falade 2001).

It has therefore become apparent that the lecture method, which is currently the predominant teaching approach in Nigerian Secondary Schools, is inappropriate and ineffective for achieving the high objectives of the Social Studies programme. There is, therefore, a need to search for more effective strategies which are suitable and efficient for promoting the level of secondary school Social Studies achievement beyond contemporary limits and to the satisfaction of the current Social Studies curriculum requirements.

Conventional methods of instruction

According to Salawu (1999), the method of teaching could be regarded as the vehicle through which a message is delivered. The conventional method of teaching therefore, could also be regarded as the hitherto existing traditional methods of instruction in the normal classroom setting. There exist several methods of such conventional methods of instruction which have permeated our educational system over the years. Among such conventional methods of instruction are lecture method, Montessori method, dramatization method, inquiry method, project and field trip among others. Among the conventional methods of instruction, no one method could be said to be most appropriate. Rather, classroom experience shows that in most cases, two or more teaching methods are combined by teachers in classroom practice.

Lecture method allows a great deal of information to be passed to the learner and favours handling of large classes. In spite of this advantage, the lecture method does not stimulate students' innovation, inquiry and scientific attitudes. It encourages students to cram facts which are easily forgotten (Faniran 1969; Okwilagwe 2002). However, there is still a need to search and incorporate modern instructional strategies which the advanced world has long accepted into their classrooms.

Cooperative learning

According to Amosun (2002), a number of research works have been carried out on the efficacy of Cooperative Learning in Nigeria. Such studies include those of Okebukola (1984), Alebiosu (1998), Esan (1999) and Adeyemi (2002). More recently, Omosehin (2003) investigated the effects of a training programme in cooperative learning of pre-service teachers' classroom practice and pupils' learning outcomes in Social Studies. It was the conclusion of all these studies that cooperative learning strategies seem more useful than other instructional strategies.

Cooperative learning is the instructional use of small groups in which pupils/students work together to maximize and gain from each other (Johnson and Johnson, 1994, 1999). In cooperative learning, pupils are expected to help, discuss and argue with each other; assess each other's current knowledge; and fill any gaps in each other's understanding (Slavin, 1995). Bruffee (1995) saw cooperative learning as a set of processes which help people interact together in order to accomplish a specific goal or develop an end product which is usually content specific. Kagan (1989) provided an excellent definition of cooperative learning by looking at general structures which can be applied to any situation. His definition provides an umbrella for the work of cooperative learning specialist. He states inter-alia:

“the structural approach to cooperative learning is based on the creation, analysis and systematic application of structures, or content-free ways of organizing social interaction in the classroom.”

Moreover, cooperative learning involves a small group of learners who work together as a team to solve a problem, complete a task or accomplish a common goal (Newman, Nath & Rock, 1990; p. 98).

There are many different cooperative learning techniques, however, all of them have certain elements in common as established by Johnson, Johnson and Holubec (1991). These elements are the ingredients necessary to ensure that when students do work in groups, they work cooperatively: first, the members of a group must perceive that they are part of a team and that they all have a common goal; second, group members must realize that the problem they are to solve is a group problem and that the success or failure of the group will be shared by all members of the group; third, to accomplish the group's goal, all students must talk with one another to engage in discussion of all problems; finally, it must be clear to all that each member's individual work has a direction effect on the group's success. Team work is utmost important.

One important reason for the inconsistent implementation of the cooperative learning is an imperfect understanding of what the method really is. The study by Sparapani (1997) showed that teachers learn about cooperative learning incidentally rather than intentionally. Studies concerning how teachers actually use Cooperative Learning in the classroom also suggest that attention needs to be paid to training the essential features of cooperative learning (Antil, Jekins, Wayne & Vadasy, 1998; Johnson & Johnson, 1999). For teachers to acquire cooperative strategies, they must first be incorporated into teacher education programmes and demonstrated accordingly. Moreover, the instructional techniques should be placed at the core educational curriculum to promote academic achievement and development of appropriate social skills (Hillkirk, 1991).

Problem Solving Approach

Problem solving involves taking series of actions in the process of an investigation that seeks to bridge the gap between a problem state and the anticipated goal (Jackson, 1975). A problem-solving strategy therefore comprises action steps taken by the learner to reach anticipated goal when faced with a problem situation. Problem solving means engaging in a task for which the solution method is not known in advance. Yewande (2000) was of the opinion that problem solving is using information and reasoning to overcome obstacle barrier.

Problem-solving is the highest form of learning (Klausmeier & Goodwin, 1993), since the individual defines new ideas based on this process. Likewise, it is well known that when faced with a problem one needs knowledge of rules, on the one hand, and the capacity to use them, on the other, thus achieving transfers of learning. Being able to solve problems, then, enables persons to their environment and to modify it in part. (Serrano, Cantu & Vila, 2003).

Teaching pupils to solve problems is based on the hypothesis that knowledge is organized and stored in memory in a sequential and logical networks (Anderson, 1992) and hence it can be retrieved in a stepwise and sequential manner to solve problems (Selvaratnam, 1983). This then means that for successful solution of a problem knowledge alone may not be sufficient. The Knowledge of how the conceptual knowledge should be applied (problem-solving skills) in solving problem is equally important. This form of knowledge is called the procedural knowledge (West, Framer & Wollif, 1991) on which the theory of problem-solving strategy is based.

Problem-solving as a teaching strategy has been used with degree of success in social sciences (Adewuya, 1999; Ajimoko 1975; Adaralegbe, 1980; Anderson, 1985; Boateng, 1985; Obebe, 1981; Onyabe, 1979; Orji, 1998; Udoh, 1989). Though, research on problem-solving strategies appears to be copious in social sciences education literature, there is still paucity of such research in Social Studies in Nigeria. Furthermore,

Adewuya (1999) has suggested that problem-solving strategies could be employed to effect changes in attitude towards Social Studies. Based on this suggestion therefore, it is possible that a generalized problem-solving teaching strategy (containing the commonly agreed phases) in social sciences which could be applied successfully in teaching problem solving in different social sciences discipline may as well facilitate students' achievement in Social Studies. The present study is aimed at verifying this speculation.

This study therefore investigated the effects of cooperative learning, problem-solving and conventional strategies on JSS two boys' and girls' achievement in Social Studies. Specifically the study addressed the following research questions:

- 1) Is there any significant effect of treatment (Cooperative learning, problem-solving and conventional methods) on achievement in Social Studies among JSS two students?
- 2) Do secondary schools boys and girls differ in their achievement in Social Studies?
- 3) Is there any significant interaction effect of treatment and gender on achievement in Social Studies among JSS two students?

Method

Sample

Stratified cluster sampling technique was used in the selection of JSS two students from three public schools in Ife central Local Government Area of Osun State. In all, 150 students (80 boys and 70 girls) participated in the study. Their ages ranged from 11 years to 15 years (mean age 13.6; Sd = 1, 3).

Instruments

Instruments used for the study were developed and validated by the investigator. They are:

- (i) Social Studies Achievement test with a split-half reliability coefficient of 0.78.
- (ii) Instructional package on cooperative learning strategy with a split half reliability index of 0.92.

(iii) Instructional package on problem solving strategy with a split half reliability index of 0.84.

Procedure

The study employed pre-test, post-test control group non randomized quasi-experimental design in which the treatment at their levels was crossed with gender. After the initial random-selection of the classes to be used in each school, the classes were randomly assigned to the treatment conditions. This was followed by the administration of the pre-test by the researcher.

1) Experimental Group One: For this group, cooperative learning strategy was employed. Students were group into 5 each and were presented with instructional package based on cooperative learning strategy.

2) Experimental Group Two: For this group students were exposed to instructional package based on problem solving strategy.

3) Control Group: For this group, the conventional lecture method was employed.

The treatment lasted for four weeks of three periods of thirty-five minutes per period per week. The investigator and three other assistants handled the treatments conditions in all the classes. At the end of the treatment, the Secondary School Social Studies Achievement Test was administered to the students.

The post-test performance scores were subjected to analysis of covariates. The Duncan test and graphical illustrations were used as post-hoc measures.

Results

Table 1 shows data on analysis of covariance of Social Studies test scores by treatment (teaching strategies) and gender: The table shows a significant main effect of

treatment ($F_{2,149} = 158.734, p < 0.05$) as well as significant interaction effects of treatment and gender ($F_{2,149} = 158.734, p < 0.05$).

Table 1: Summary of Analysis of Covariance of Social Studies Achievement Test Scores by Treatment and Gender

| Some of variation | Sum of Squares | df | Mean Squares | F | Significance |
|--------------------|----------------|-----|--------------|---------|--------------|
| Covariates | 310.071 | 1 | 310.071 | 724.122 | .000 |
| Pre-test | 310.071 | 1 | 310.071 | 724.122 | .000 |
| Main effects | 138.368 | 3 | 46.123 | 107.713 | .000 |
| Gender | 1.107 | 1 | 1.104 | 2.578 | .111 |
| Treatment | 135.941 | 2 | 67.970 | 158.734 | .000 |
| 2-way interactions | 9.808 | 2 | 4.904 | 11.453 | .000 |
| Gender x treatment | 9.808 | 2 | 4.904 | 11.453 | .000 |
| Explained | 458.247 | 6 | 76.374 | 178.361 | .000 |
| Residual | 61.233 | 143 | .428 | | |
| Total | 519.480 | 149 | 3.486 | | |

* $p < 0.05$

Table 2 shows data on Multiple Classification Analysis (MCA) of Social Studies Achievement Test Scores by treatment and gender groups. The data shows that the cooperative learning strategy group has the highest adjusted post-test mean scores of 11.891 followed by the problem solving strategy group and the conventional method group with adjusted post test mean scores of 7.671 and 6.901 respectively. The MCA table also shows that female students had a slightly higher adjusted post-test mean scores (8.911) than their male counterparts (8.741). In all, it reveals a multiple R square value of 0.863 and beta values of 0.05 and 1.18 for gender and treatment respectively.

Table 2: Multiple Classification Analysis MCA of Strategies Achievement Scores by Treatment and Gender Groups

| Variable + category | N | Unadjusted Deviation | Beta | Adjusted for independent + Covariance Deviation | Beta |
|-----------------------------------|----|----------------------|------|---|------|
| Gender | | | | | |
| Male | 80 | .18 | | .08 | |
| Female | 70 | .21 | .10 | .09 | .05 |
| Treatment | | | | | |
| (i) Cooperative learning strategy | 50 | 2.38 | | 3.07 | |
| (ii) Problem solving strategy | 50 | 1.82 | | -1.15 | |
| (iii) Conventional strategy | 50 | 1.56 | .921 | -1.92 | 1.18 |
| Multiple R | | | | | .863 |
| Square | | | | | .929 |
| Multiple R | | | | | |

The results from the post hoc analysis (Table 3) show that students in the cooperative learning strategy group performed significantly better than their counterparts in either of the problem solving or conventional strategies groups. The result also show that students in the problem solving strategy group performed significantly better than those in the conventional group.

The significant interaction effect of treatment and gender was disentangled as shown in figure 1. The figure shows ordinal interaction where across the respective levels of gender, the mean performance of students exposed to cooperative learning strategy was the highest followed by those of students exposed to problem solving strategy and the least was that of students in the conventional group. The figure also shows that boys appear to benefit more from cooperative learning than girls; while girls tend to benefit more from problem solving strategy than boys. These are irrespective of the tendency for both boys and girls to exhibit highest performance in Social Studies when exposed to cooperative learning strategy of teaching

Table 3: Duncan Multiple Range Comparison of Treatment Groups

| Mean | Strategies Groups | Treatment Groups Conventional Problem Solving Cooperative |
|---------|-------------------|--|
| 7.2600 | Conventional | |
| 8.0004 | Problem solving | |
| 11.2036 | Cooperative | |

* Denotes pairs of groups significantly different at $p < 0.05$.

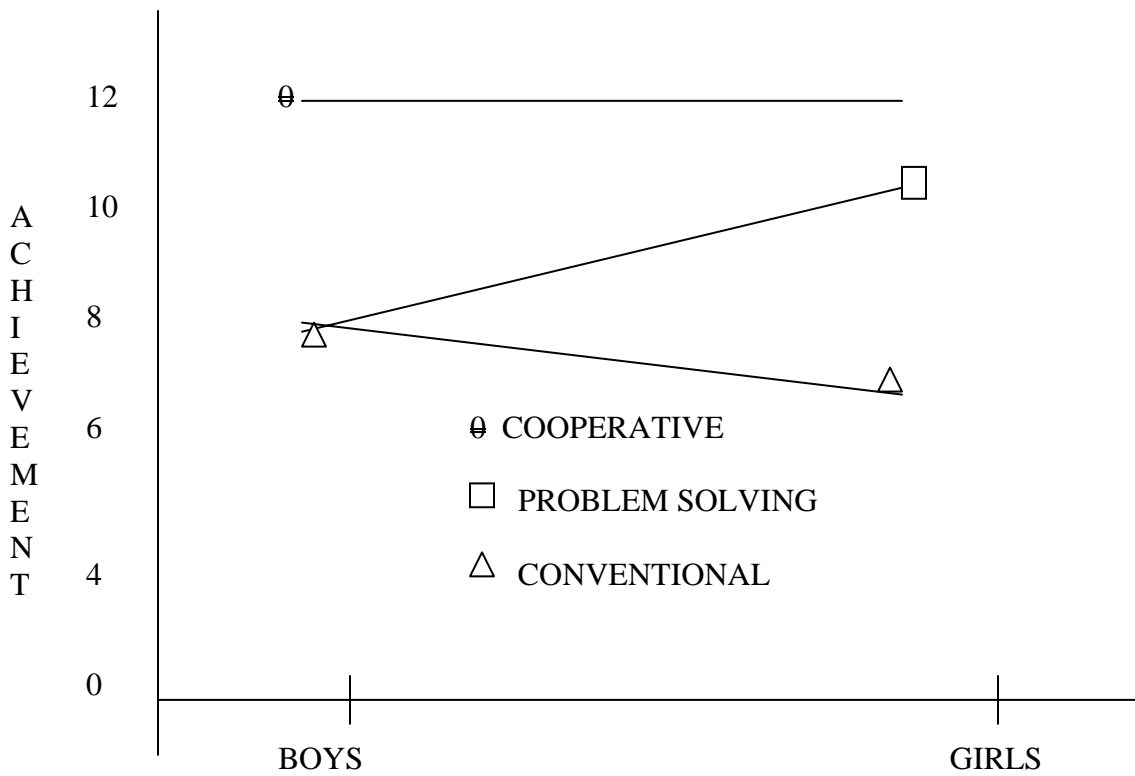


Figure 1: Graphic Illustration Effect of Treatment and Gender on Achievement in Social Studies

Discussion and Conclusion

The results of this study as revealed in tables 2 and 3 show that cooperative learning strategy is the best followed by the problem solving strategy and conventional strategy in that order. This finding is related to some of the earlier findings and assertions by researchers such as Okebukola (1984), Alebiosu (1998), Esan (1999), Johnson and Johnson (1999) and Omosehin (2003). It was the conclusion of all these studies that cooperative learning strategy seems more useful than other instructional strategies.

As regards the achievement of boys and girls exposed to the different treatment conditions, the boys had higher achievement mean scores than girls in the cooperative and conventional strategies groups while the girls had an edge over the boys in the problem solving, strategy group (figure one). Nevertheless, a close look at the figure would reveal the fact that both boys and girls exhibited their highest achievement under cooperative learning (Boys = 11.42, Girls 11.00) as against their achievement under the problem solving (Boys = 7.55, Girls 8.73) and the conventional group (Boys = 7.32; Girls = 7.20).

The investigator thus considers the use of cooperative learning strategy as the most suitable method for teaching Social Studies hence it should be preferred. It is also obvious from the results of this study that improved teaching ability of boys and girls depend on the exposure to many teaching strategies. Therefore, if we want to improve secondary school boys and girls teaching ability, we have to embrace the cooperative teaching strategy in our schools.

In view of these findings, the idea of limiting students to only conventional method should be discouraged. Teachers should encourage team work among students in order to work together cooperatively.

The government should equally provide avenue for students in order to interact freely with each other. It is hoped that the implementation of these recommendations

would lead to the improvement of teaching strategies of secondary school students and subsequently their achievement in Social Studies.

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