

# Effect of Cooperative Learning Strategy On Students' Academics Achievement in Mathematics in Secondary Schools in Ondo West Local Government Area of Ondo State

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## Abstract

The study investigated the effects of co-operative learning strategy on students academic achievement in Mathematics in secondary schools in Ondo West Local Government Area of the study also determined the effects of corporative learning strategy on gender achievement in Mathematics. Two research questions were raised and two hypothesis were generated to guide the study. A quasi-experimental design was adopted for the study referred to as pre-test post-test control group designed. A total of 114 senior secondary school two, Mathematics students took part in the study. Two intact schools were used and data on students Mathematics Achievement Test was used. The instrument has a coefficient of internal consistency of 0.78, t-test was used in analyzing the data. The findings revealed that co-operative learning strategy is more effective than conventional learning strategy. Based on the findings, it was recommended that Mathematics teachers in Ondo West Local Government state should use the cooperative learning strategy in their teaching of Mathematics

**Keywords:** Cooperative Learning Strategy, Mathematics, Conventional Strategy, Achievement,

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## Introduction

Mathematics is a science of numbers that deals with logic, accurate, thinking and reasoning. Mathematics is a basic tool in the development of any science based knowledge such as technology, industry and even for sound analytical reasoning in daily living in a modern society, which is why Mathematics is described as the queen of all science. The characteristics of most Mathematics concepts have resulted into making it difficult and abstract subject to learners. The inclusion of mathematics in the core curriculum of 9-3-4 system of education is to achieve the broad goals of secondary education.

The perception of students that Mathematics is a difficult subject could be envisaged as one of the major reasons for the low performance recorded. Popoola (2004) maintained that mathematics helps an individual to develop his personality through clear, logical and critical thinking as well as power of reasoning. Thus, mathematics and business subjects are not mutually, exclusive in terms of usability. Mathematics is a tool used in the daily lives of an individual.

The contributions which the knowledge of Mathematics has made to economics, industrial and technological growth of modern world are quite obvious to everyone. The discoveries such development of supersonic flights, the invention and launching of satellite depends largely on the application of calculus, an aspect of mathematics. Mathematics is a fundamental science, which is necessary for the understanding of most other field. Awolade (2003) assets that no binding forces among the various branches of science, physical Biological and Social as mathematics. In spite of all the advantages derived and the recognition given to Mathematics as one of the core subjects at all levels of education on and as a pivot of technological and the students teachers economical development there are wide gaps between curriculum planners the implementer and what goes on in the classroom. Obodo (1997) in Ojo (2002) matriculated the interest notions held by many Africans that Mathematics is a very difficult subject which is capable of making one mad.

The problem of poor achievement of students in mathematics is of great concern to mathematics educators and relevant stakeholders in education. The WAEC Chief Examiner's report (2010) ineffective and uninspiring teaching strategies were said to be responsible for the observed poor academic achievement in senior secondary school mathematics. It was observed that Mathematics teachers are used to convention method of chalk and talk that yielded poor results. The lapse suggests that there are other methods of teaching Mathematics that may be more effective but are yet to be investigated and identified.

The poor performance of students in mathematics at all levels of education has been a matter of concern to the entire citizenry (Bande, 2002). The researcher's personal experience as one of the West Africa Examination Council (WAEC) and National Examination Council (NECO) examiner found that students' performance in Mathematics over the years has been poor and not encouraging. According to Clark (2006) attributed students poor academic achievement to poor teaching methods and strategies employed by teachers during mathematics lessons. Mathematics which appears to be the base of all science subjects demands a systematic and interesting method (s) that will attract both teachers and students. From the researcher's experiences as a teacher, the content of Mathematics curriculum indicate that the traditional teacher-centered approaches are not sufficient and appropriate to promote efficient learning. However, there is a need for the use of teaching strategies that will not only maximize meaningful understanding of concepts in Mathematics but will provide students the opportunity to interact with the environment and also make students



and the teachers to clarify their misconceptions. Therefore, there is need to shift from the conventional methods of teaching to a more innovative method of teaching mathematics such innovative method as cooperative learning strategy.

Cooperative learning is an instructional strategy that has been recognized as an important strategy that enhances Mathematics learning in students. Cooperative learning is a method of learning in which students at different academic levels of ability work together in small groups of four to six persons achieve an academic purpose set by the teacher.

This can be used to bring concepts, instruction materials and ideas to the students or learning Ghina (2005) defined cooperative learning as an instructional task design that engages students actively in achieving lesson objectives through their own efforts and the efforts of their small term.

It is proposed particularly for all learners of different ages and sounds suitable for students with varying background. This enables each person, to reflect on and review the action(s) they have taken and the learning points arrived at. Cooperative learning is a successful teaching strategy in which small teams each with students of different levels of ability use a variety of learning activities to improve their understanding of subject each member of a team is responsible not only for learning what is taught but also helping team mates to learn, thus creating an atmosphere of achievement (Ronsini, 2000).

The method aims at developing new structured opportunities for shared learning strategy, encourages closer working together among learners. However, cooperative learning strategy emphasized the importance of group work. They further recognized that through the use of cooperative learning much learning occurs through the socialization process. Lifelong learning further encourages students to consider the contribution they can make to the learning of others. It is collectively based on the premise that participants are willing to share knowledge with others whereas traditional learning is often based on individualistic approach. It is found further that action learning set can be a powerful vehicle for introducing students to further collaborative learning, tapping into knowledge and learning together through shared experience. Gender differences in Mathematics also have received serious attention in Mathematics Education research in the last two decades. Males and females have been compared on different variables such as achievement attitude, motivation and interest.

Popoola, 2004 and Akinsola, 2006 but in this study, attention is only focused on gender differences in Mathematics in favour of boys at different times. Gender differences in Mathematics in favour of boys have been attributed to factors such as developmental changes in gender identity, teacher and parents' attitude and belief towards mathematics and in turn contribute to the differences identified between boys and girls in their attitudes toward Mathematics. Popoola (2004) reported no gender differences in Mathematics with the senior class.

The purpose of the study is to investigate the effects of cooperative learning strategy and conventional method of teaching with respect to academic performance of students in Mathematics at SSII. It also examined the effect of cooperative learning strategy on gender achievement in Mathematics.

### **Hypotheses**

Based on the above research questions, two hypotheses were generated

- 1) There is no significance difference between achievement scores of students taught with cooperative learning strategy and those taught with traditional method of teaching.

- 2) There is no significant difference in the performance mean scores of male and female students of the experimental and control groups respectively.

### Methodology

The research instrument used for this study is the Mathematics Achievement. Test (MAT). It is a self-designed instrument for the students which consists of section A and B. Section A consist of information on bio-data of the respondents. Section B is made up of 30 multiple of test with four option A, B, C and D consider by the students. This drawn from the past questions of SSCE. The study employed a quasi-experimental of pre-test, and post test group design. The study was 2x2x2 non-random of factorial designed cross with instructional strategies. All the groups were given a pretest before the experiment commences and post-test after the treatments. The pre-test was used to establish the based for students to measure their performance and the post-text was used in determining the extent of the efficiency of the strategies. The population for this study consisted of a total 114 Senior Secondary Class Two. Immediately after the treatment the post-test was administered to the two groups respectively, and two weeks after the administration of the Post test, the post-test was re-administered to the two groups respectively to ascertain how much of the concepts learnt they could retain.

### Results

**Hypothesis one:** There is no significant difference in achievement scores of students taught with cooperative learning strategy and those taught with conventional method of teaching

**Table 1:** Test analysis of post-test scores of those taught with cooperative and conventional learning strategies

Groups	N	Mean	Std	T cal	Df	T tab
Cooperative Learning	57	25.84	5.83	3.2	112	1.98
Conventional Method	57	19.05	5.23			

Table 1 shows that t-cal (3.2) is greater than the critical t-value of 1.96 with a corresponding p-value of 0.000 which is less than 0.05 alpha level of significance. Since the calculated value is greater than the critical t-value, the null hypothesis is rejected. This indicates that there is a significant difference in achievement or performance of students exposed to cooperative learning strategy and those that not exposed.

**Hypothesis Two:** There is no significant difference in the achievement mean scores of male and female students whose teachers exposed to cooperative learning strategy.

In order to test the hypothesis achievement mean scores of male and female students whose teachers engage in cooperative learning strategy were subjected to Analysis of covariance (ANCOVA) at 0.05 level of significance. The result is presented in Table 2.

**Table 2:** ANCOVA of the achievement of student exposed to cooperative learning strategy by gender

Source	SS	Df	MS	FC	F <sub>t</sub>	P
Corrected Model	21. 612	2	10. 806	1. 420	3.08	0.210
Covariate	20. 937	1	20. 937	2. 632	3.76	0.082
Sex	5.999	1	6. 111	0.843	3.62	0.362
Error	844. 260	117	7. 251			
Corrected Total	865. 872	119				

Total	123655. 00	120				
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$P > 0.05$

Table 2 Shows that ANCOVA of the achievement of Mathematics Students that exposed to cooperative learning strategy by gender. It revealed that  $F_c$  (0.843) is less than  $F_t$  (3.62) at 0.05 level of significance. The null hypothesis is not rejected. This implies that there is no significant difference in the mean scores of male and female exposed to cooperative learning strategy.

### Discussion

The findings of this study revealed that the students' performance in Mathematics was poor before they were exposed to cooperative learning strategy. The findings also show that there was improvement in the performance of students resulting from their exposure to cooperative learning from their exposure to cooperative learning strategy. This mirrors the result reported by Oseigbo (2004) who investigated students' performance in principle of chemistry class, taught using cooperative learning strategy and conventional method. The result obtained in table two the performance of students in cooperative learning strategy and conventional method revealed that there is significant difference in the performance of students exposed to cooperative learning strategy and those were taught with conventional method. The result obtained in table two revealed that there was no significant difference between the performance of male and female students in both the experimental and the control groups respectively. This is in agreement with the submissions of Okeke (2008) and Okwu and Otunbah (2007) who found that there is no significant effect of gender on academic performance of students in mathematics and concluded and how effective a teaching method would not be determined by the gender of the students. the finding supported the opinion of Popoola (2004) who found out no significant difference between the achievement of male and female students in mathematics.

### Recommendations and Conclusion

Based on the findings of this study, the following recommendations were made.

1. Mathematics teacher be encouraged to adopt cooperative learning strategy in order to demystify mathematics in its entirety, simplicity the perceived abstract nature of mathematics concepts for improved learning outcomes and stimulate students attitude towards the learning for improved academic performance and subsequently, create an environment where people would realize that mathematics is a subjects that be understood by the students and that they can perform better in it.
2. Cooperative strategy should be adopted in the teaching of mathematics in secondary schools. This will enhance the classroom teaching learning activities and also bring improvement to learners' performance.
3. Classroom social interaction should be encouraged through the use of cooperative learning strategy. This will enhance inter-dependence among lears and learners' opinion will be given necessary recognition
4. Teachers need to go beyond the traditional chalk and talk method they need to be updated in the use of instructional materials to enhance their teaching and make lessons more interesting, meaningful and real to students.

### Conclusion

Based on the findings of this study, it could be concluded that the use of cooperative learning strategy is an effective method that enhances better of secondary school students





in mathematics. As effective as the method is, it is not gender biased and is potent in all locations. The researcher concludes that cooperative learning strategy of instruction is superior to the traditional chalk-talk approach in fostering mastery of mathematics concept among senior secondary school students. Cooperative learning makes student to do exploration, cooperation, asking questions, answering questions and writing down questions and answers.

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