



**A STUDY OF THE EFFECT OF CO-OPERATIVE LEARNING ON
ACHIEVEMENT, LOGICAL REASONING AND INTEREST IN MATHEMATICS.**

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Abstract

The world witnessing various problems, namely pollution, population, poverty and inter-personal relationship. The first three components and its associated problems are technical and can be dealt with the help of science and technology. But the problems of inter-personal relationship can't be dealt with technology but by developing individuals' affective domain. The formal education system focuses on the overall development of students. Deliberate efforts are put in terms of various experiences so as to bring desirable change. The experiences are planned by the teachers considering content and the students' characteristics. Mathematicians occupies important place in school curriculum. Its major objective is the development of logical thinking, reasoning ability and problem solving skills. One of the most important pillars of education is learning to live together. We are depending on each other for many things and therefore the development of feeling of togetherness is important. Co-operative learning strategies are the techniques which help individual to learn from others and also contribute in others learning. The researcher tried to use various methods such as think pair share, Numbered head, circle the sage, three step interview and team pair solo. etc to provide inputs for the topic sales, rebate and commission. Researcher very specifically chosen these topics from mathematics as it provides opportunities for discussion, expressing opinions, along with reasoning ability and problem solving skill. The researcher also attempt to study students' interest in mathematics with the thought that the peer interaction might have positive influence on it. Achievement in terms of number is thought to be important along with reasoning ability of students. Therefore for this study researcher made an endeavour to implement a planned co-operative learning programme and study its effectiveness in terms of students' achievement, interest in mathematics and reasoning ability.



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Introduction: Learning is a continuous process. A man can learn formally, informally and non-formally. Learning through experiences is a continuous process throughout life. In a formal system of education the environment is deliberately manipulated so that learning takes place and the desirable changes are brought about. The different subjects taught in the school are aimed at bringing about the desirable changes in a student. It is expected that the subjects taught not only impart knowledge but also helps in the development of values, attitudes, interests and logical reasoning which helps the person to act as a refined and efficient human being of the society.

Mathematics is one of the compulsory subjects at the secondary school level. It occupies an eminent place in the curriculum to help in the all round development of an individual. It primarily aimed at development of thinking process. The experiences designed are responsible for the development of logical reasoning, interest and for the development of their attitudes towards school, teacher, subject and peers.

The student's interest in a particular subject helps in learning that subject. Similarly the development of logical reasoning help an individual act in a particular manner, think critically and solve the problems in a systematic way. Interest in mathematics would increase only if students are allowed to discuss, interact, share their views while learning mathematics in schools.

Students today have a need for practical mathematics. Therefore, mathematics needs to be relevant to their everyday lives. Students enjoy experimenting hence to learn mathematics; students must be engaged in exploring, conjecturing, and thinking rather than, engaged only in rote Learning of rules and procedures. Group work practice or Co-operative teaching learning method instructional approach yields spontaneous response in the class room there by giving opportunities for a learner to interact with other learners in the class. In Co-operative teaching learning method, students work together to achieve a particular goal.

Cooperation is working together to accomplish shared goals. **Cooperative Learning** is the instructional strategies of small groups so that students work together to maximize their own and each other's Learning. The idea is simple. Class members are organized into small groups after receiving instruction from the teacher. They then work through the assignment until all group members successfully understand and complete it.

Title of the study:

A Study of the effect of co-operative learning on logical reasoning and interest in mathematics.

Variables :

The Variables of the study are as follows:-

Independent variable [treatment variable]: Cooperative learning strategies.

Dependent variables: 1 Achievement in mathematics

2 Logical reasoning in mathematics.

3 Interest in mathematics.

Operational definitions:

- 1) Achievement: achievement is defined as the score obtained by student on researcher made test on mathematics.
- 2) Logical reasoning:- It can be defined as the ability of a person to perceive the situation or mathematical problem holistically and analyzing various components and understanding the relationship between components and drawing conclusions.
- 3) Co-operative strategies:-It is the creation of the situation in such a way that two or more learning student come together and learn mathematics by sharing their experiences through activities.
- 4) Interest in mathematics: can be defined as students preference given to activities related to mathematical reading, related to books and articles.

Objectives of the Study :

- 1)To study the effect of traditional method and co-operative method on the achievement of students in mathematics.
- 2)To study the effect of traditional method and co-operative method on the logical reasoning of students in mathematics
- 3)To study the effect of traditional method and co-operative method on the students interest in mathematics

Hypotheses of the study:

- 1) There is no significant difference in students' achievement in mathematics exposed to traditional method and Co-operative method.
- 2) There is no significant difference in logical reasoning of the students exposed to traditional method and Co-operative method.
- 3) There is no significant difference in students' interest in mathematics exposed to traditional method and Co-operative method.

Methodology of the Study:

For the present study the experimental method has been adopted.

The experimental method has two groups namely, exposed to traditional method and co-operative method of learning.

Sample: Its size, technique and nature

The researcher approached Marathi medium schools in C. B.D.Belapur ,Navi Mumbai which ensure the similar students characteristics. The principals who agreed to give school for conducting research were selected.

One group of students was exposed to traditional method. The class IXth was selected as per the convenience of the school therefore the incidental sampling technique has been used. There were total 44 students in the class.

The second group was exposed to co-operative method. The total sample consisted of 40 students of standard IXth. The incidental sampling technique has been used.

Tools of the Research:

1) Achievement test in Mathematics :-

Achievement test of 30 marks was prepared by the researcher on the topic 'Sale, Rebate and commission'.

2) Logical Reasoning scale:-

To measure logical reasoning, a tool prepared by Mr.vertha Marcus was used .

3) Interest in Mathematics scale:-

The researcher prepared five point rating scale to study the students interest in mathematics.

Steps in conducting Research:

1. Pre- test was given to both the groups.

2. Both the groups were exposed to two different treatments.

The different group techniques have been used for the group exposed to co-operative learning. The types of co-operative method used were Think-pair share, three step Interview, roundtable, Numbered head ,circle the sage ,three minute interview and team, pair, solo.The time taken was 22 hours.

The traditional method groups experienced class discussion , drill , practice and memorisation Techniques. The time taken was 20 hours.

The topic selected was sale , rebate and commission from IX th standard mathematics. For the co-operative group researcher required two hours more because these strategies were new to students and in the beginning they were hesitating to interact.

3 .Post test were given after the treatment to both the groups .The post test given were achievement test in mathematics, logical reasoning and interest in mathematics.

Data collection.

The researcher collected the data by different tools mentioned earlier.

Analysis of data.

The data was analyzed by using ‘CR’ test. The CR value of gain score was calculated .

Testing the hypothesis.

The null hypotheses were tested using statistics, which is discussed in the following section.

- 1) There is no significant difference in students’ achievement in mathematics exposed to traditional method and Co-operative method.

The hypothesis was tested using ‘CR’ test. The following table indicates statistics for ‘CR’ test.

Table 1.1 Descriptive statistics of achievement by traditional method and co-operative method.

Method	M(Mean)	Sd(Standard Deviation0.	N (No. Of Student)	‘Cr’ Value
Co-Operative Method.	11.15	4.26	40	9.16
Traditional Method.	4.25	1.64	44	

Interpretation:-The calculated CR value was 9.16 which is greater than 2.67. Thus, “CR value” was significant at 0.01 level. So, the null hypothesis was rejected.

- 2) There is no significant difference in logical reasoning of the students exposed to traditional method and Co-operative method.

Table 1.2 Descriptive statistics of logical reasoning by traditional method and co-operative method.

Method	M(Mean)	Sd(Standard Deviation0.	N (No. Of Student)	‘Cr’ Value
Co-Operative Method.	3.43	2.11	40	5.47
Traditional Method.	1.48	0.78	40	

Interpretation :-The calculated CR value was 5.47 which is greater than 2.67. Thus, “CR value” was significance at 0.01 level. So, the null hypothesis was rejected.

3) There is no significant difference in students’ interest in mathematics exposed to traditional method and Co-operative method.

Table 1.3 Descriptivestatistics of interest by traditional method and co-operative method.

Method	M(Mean)	Sd(Standard Deviation0.	N (No. Of Student)	‘Cr’ Value
Co-Operative Method.	25.2	8.78	40	8.27
Traditional Method.	13.2	2.61	40	

Interpretation :-The calculated CR value was 8.27 which is greater than 2.67. Thus, “CR value” was significance at 0.01 level. So, the null hypothesis was rejected.

Findings of the study:

On the basis of the analysis the following findings are drawn.

- 1) The IXthstd student taught by Co-operative method performed better in achievement than the IXthstd student taught by traditional method
- 2) The IXthstd student taught by Co-operative method performed better in logical reasoning than IXth student taught by traditional method
- 3) The IXth student taught by Co-operative method performed better in interest than IXth student taught by traditional method

DISCUSSION RELATED TO FINDINGS: -

1. There is an increase in the achievement scores of the student exposed to co-operative learning, as the students were trained to approach the problem sequentially with the help of the worksheet on ‘sale,rebate and commission”These worksheets prepared by the researcher on each sub-topic helped students to understand the concept very precisely and apply their knowledge while solving the problems. The strategies used were Think-pair-share, Team-Pair-Solo, Circle the saga and Watch tower.

2. It was found that the logical reasoning was enhanced due to activities conducted by researcher in the classroom. The activities that helped to achieve the result are Tea and Lime Juice, Make snake alive, lets buy mobile, Mulakat and Lets watch a commercial. Different situation were provided to students which expect them to apply various ways of thinking and solve it.Thus the Students developed a logical thinking to solve these situations.

3. There is an increase in the Interest scores, as the students were trained to approach the problem sequentially with the help of the activities. These activities prepared by the researcher on each sub-topic helped students to understand the concept very precisely and apply that knowledge while solving the problems. The instructional material developed had examples of day to day environment in which they live. It involves lot of interaction among themselves which were very challenging. Activities demand them to be interdependent. The activities focused on developing Interest score were Lets go for shopping, Lets buy mobile, worksheet on discount series, Mulakat, Lets watch a commercial, I am the leader, word puzzle and watch tower.

SUGGESTION

- This study will be helpful for teachers so as to use cooperative learning strategies.
- Different subject teachers can prepare and use these strategies in their subject.
- This will also help for trainee teacher to develop their lesson plans in an innovative way.
- This is also helpful to bring change in the transaction of teaching learning process
- The in service training program can be organized.
- The teacher educators can also be benefited .

The principal and management can organize in-house training program for teachers to plan lessons for co-operative learning strategies.

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