

EFFECTIVENESS OF STUDENT TEAM ACHIEVEMENT DIVISION (STAD) ON ACHIEVEMENT IN MATHEMATICS OF 9th CLASS STUDENTS

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Abstract

The purpose of present paper was to study the effectiveness of STAD (cooperative learning strategy) on achievement in mathematics of 9th class students. The sample consists of 90 students (two sections) of class IX studying in a school affiliated to Punjab School Education Board, Mohali. Pre-test Post-test control group design was employed. Experimental group was taught Mathematics content by using STAD strategy of cooperative learning and control group was taught by traditional method (lecture) by the investigator. Data were collected by using achievement test in mathematics (2011) developed by investigator. Data was analyzed by employing t test and results showed that students taught through STAD (Mean=72.01, N=42) achieved significantly higher on achievement in mathematics as compared to traditional method of teaching (Mean=64.46, N=48). Gender difference was not found to be significant between boys and girls in achievement in mathematics of 9th grade students.

Key Words: Achievement in Mathematics, Cooperative Learning, Student Team Achievement Division (STAD), Gender

Mathematics has been recognized as one of the central strings of human intellectual activity throughout the centuries. From the very beginning, mathematics has been a living and growing intellectual pursuit. It has its roots in everyday activities and forms the basic structure of highly advanced technological developments. It also offers opportunities for opening the mind to new lines of creative ideas and channeling thoughts. For scientists, technologists, engineers, doctors, specialists and others, mathematics is there to have catalytic impact upon their understanding in order to serve mankind all over the globe, productively and usefully. Mathematics is defined as the study of patterns of structure, shape, figures, numbers and space. Mathematics in its strict sense is described as an abstract science which investigates the conclusions of spatial-numerical relations. It is study of facts that can't be expressed in concrete fashion. With the learning of Mathematics the cognitive and conative powers of the learners is sharpened. That's why; the great scientist Etymologically mathematics has been derived from Greek word 'Manthanein'

which means 'learning' and 'Techne' means 'art or simple method'. So Mathematics means 'Inclined to learn'. Mathematics should be visualized as the vehicle to train a child to think, reason, analyze, and articulate logically. To improve achievement in mathematics we need to make our classroom best place to interact with each other, communicate their ideas effectively to other classmates and construct knowledge through cooperative efforts instead of making students passive listeners. For this purpose we have to shift from a teacher dominated classroom to student centred. This shift forces us to think out of the box to find some student centered modes (suitable for Indian conditions) as compared to the teacher centered authoritative modes of transacting the curriculum. Cooperative Learning, Constructivist and Active Learning approaches can be considered as examples of such student-centered learning strategies. Common to these approaches is the construction of knowledge by the learners rather than knowledge being transferred from teacher to student. Cooperative learning is one of the main active group learning pedagogies. Co-

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operative learning means “Cooperation, a form of collaboration, is working together to accomplish shared goals” (Johnson & Johnson, 1989). Cooperative learning has also been described as one of the most widely investigated educational approaches (Slavin, 1996). Hundreds of studies have cited its benefits, and Johnson and Johnson (1989, 2000) and Slavin (1991) have produced extensive reviews of these. Numerous studies reported magnificent convergent outcomes across a wide range of areas for Cooperative learning studies done by several scholars and proponents of Cooperative learning since the 1900s, particularly studies done since 1970s have indicated not just a number of greater benefits of Cooperative learning to students, but also how Cooperative learning has become popular in different parts of the world. Slavin (1995) summarized the most extensively researched and widely used cooperative learning techniques as Learning Together and Alone, Teams-Games-Tournaments (TGT), Group Investigation, Constructive Controversy, Jigsaw Procedure, Student Teams Achievement Divisions (STAD), Complex Instruction, Team Accelerated Instruction (TAI), Cooperative Learning Structures and Cooperative Integrated Reading and Composition (CIRC). Student Teams Achievement Divisions (STAD) was selected in this study. Review of related literature revealed that a large number of studies have been conducted on Cooperative learning strategies in relation to a variety of cognitive, social and affective variables. Review of literature revealed that cooperative learning has significant effect on different dimensions of Achievement in Mathematics as measured by different test (Aronson et al. 1978; Rani, P. & Sharma, L. 2010; Slavin, R. E., 1996). Cooperative learning also improves Interpersonal relationships (Sharma & Sharma, 2008) and decreases levels of loneliness and social anxiety, increasing the levels of happiness among the participants (Kocak and Recep, 2012). So keeping in mind the dearth of studies on Indian soil investigator framed following objectives:

OBJECTIVE

- To compare mean scores of Achievement in Mathematics of experimental and control

group.

- To compare mean scores of achievement in Mathematics of boys and girl.

METHOD

Sample and sampling techniques

Purposive sampling technique was employed to select sample. A sample of 90 students of 9th grade was taken. Two section of 9th class from the R.S. Model Sr. Sec. School, Ludhiana affiliated to Punjab School Education Board were selected. Achievement Test in Mathematics was administered to test initial difference in two sections. It was found to be insignificant. From existing two sections randomly one was assigned as experimental and another as control group.

MEASURE

Achievement in Mathematics Scale developed by the investigator and Cooperative learning Modules based on STAD strategy developed by the investigator were employed to collect data.

PROCEDURE

The study was designed to find the effectiveness of STAD on achievement in Mathematics of 9th class school students. Permission was taken from principal of the school for conducting the experiment. In the first step achievement in Mathematics test was administered to 90 students as pretest. Two sections of 9th class were taken and randomly one was selected as experimental group and another as control group. One group was assigned randomly to the treatment. This was termed as experimental group and the other was termed as control group. The experimental group was taught Mathematics through STAD strategy (with modules prepared by investigator) for a period of 30 at the rate of 40 min. per day. On the other hand control group was taught Mathematics with the help of conventional (lecture) method for a period of 30 at the rate of 40 min. per day. After completion of the treatment achievement in mathematics test was administered to both the groups as post test. The extraneous variables like influence and motivation of the teacher was controlled by teaching both groups by the investigator himself.

Results and Discussion

Table 1: Significance of difference between Mean Scores of achievement in mathematics between experimental and control group

S.No.	Group	N	M	S.D	SEM	t-value
1.	Experimental	42	72.01	7.57	1.16	5.002**
2.	Control	48	64.46	6.75	0.97	

** Significant at .01 level

It is evident from the table 1 that reported t-value for mean scores of achievement in Mathematics is 5.002, which is significant at .01 level with df 88. It means that there is significant difference in mean scores of achievement in Mathematics between experimental and control groups. Hence, the null hypothesis, 'There will be no significant difference in the mean scores of achievement in mathematics of Control and Experimental group' was rejected at

specified level. Further the mean scores of achievement in mathematics of the experimental group (Mean=72.01, N=42) is higher than that of control group (Mean=64.46, N=48). It reflects that cooperative learning (STAD strategy) was found to be significantly effective to increase achievement in Mathematics as compared to traditional method of teaching.

Table 2: Significance of difference between Mean Scores of achievement in mathematics between boys and girls

S.No.	Group	N	M	S.D	SEM	t-value
1.	Boys	37	69.23	5.12	0.84	1.28ns
2.	Girls	53	70.26	2.36	0.32	

NS- Not significant

The t value (table 2) for mean scores of achievement in mathematics of boys and girls is 1.28, which is not significant even at .05 level with df 88. It means that there is no significant difference in mean scores of achievement in Mathematics between boys and girls students. Hence, the null hypothesis, 'There will be no significant difference in the mean scores of achievement in mathematics of boys and girls' was not rejected at specified level. It means both boys and girls do not differ significantly on the achievement scores in mathematics.

CONCLUSION

The results of the present study highlight and support the idea that cooperative learning strategies have a positive impact on achievement in mathematics of school students. As NCF-SE (2005) emphasised that knowledge should be constructed and the approach should be learner-centred. STAD approach has characteristics which makes learner active in the teaching learning process. It can be an effective method in raising the achievement in

mathematics of students in comparison to traditional method. So, more research studies should be conducted on Indian population to see the effectiveness of STAD on achievement in Mathematics to generalize the result.

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