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COOPERATIVE LEARNING STRATEGY IN MATHEMATICS AT THE SECONDARY LEVEL: A STUDY IN MUZAFFARNAGAR, UTTAR PRADESH, INDIA

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ABSTRACT:

The Title of present paper is Cooperative Learning Strategy in Mathematics at Secondary Level: A Study in Utter Pradesh. Objectives of the study are to study of the Mathematics achievement of 9th standard students taught by traditional method and by cooperative learning strategy and comparison of both variables. The present study is delimited to 9th standard students in the district of Muzaffarnagar (UP). This is an experimental research design. One hundred twenty students have been taken as sample. Mathematics Achievement Test has been used as research tool. Mean, S.D., t-test have been taken as statistical techniques. It is found out from the study that there is significant difference between control and experimental group of male students and female students. There are academic benefits of the study to the learner, to the teachers, benefits from psychological and social point of view.

KEY WORDS: *Cooperative learning strategy, Academic Achievement, Secondary Level, Mathematics subject, Gender.*

INTRODUCTION :

There is a lot of importance of education in a man's life. The education continues from birth to death in human life. According to Rig-Veda-"Education makes a man self-reliant and selfless." The teacher plays important role in imparting education. He can mend and end the future of a student. Opinion of a teacher determines his teaching methods and skill that he will choose for achieving his aims and objectives. Teaching methods are used by teacher are more or less traditional majority of them use lecturer method with less participation of the students but this method presents a bad example. The above discussion supports the importance of cooperative learning based method of teaching. Therefore, a teacher must develop proper and positive opinion towards the cooperative learning method so that they can be good teachers and carve the future of students in a magnificent manner to justify "Teacher are pillars of the nation. "Mathematics is widely used in various fields and covering a wide range of activities. However, the decline in Mathematics achievement is of concern. Among the reasons of the decline in mathematical achievement in schools, students consider mathematics as a difficult subject. Traditional programs encourage student to develop an understanding of what numbers are and provide them with the ability to perform mathematical

operations in an efficient, effective manner. Education commission1964-66 has recommended mathematics as a compulsory subject for student at school level. Mathematical knowledge is very important in our day to day work. Mathematics cannot be made more effective without effective teaching there are so many devices for effective teaching. At present the educators of different societies are evaluating different teaching learning strategies. Many educators of modern age have recognized cooperative learning method as a beneficial for different subjects. Mathematics teaching is a field in which knowledge of the subject matter is the first necessity. Teaching mathematics involves more than knowing and enjoying the subject. The mathematics teacher must be able to motivate students, he must be able to guide them to discover ideas and he must be able to evaluate the achievement of his students. Some person have inborn characteristics in the structure and functional features of their brains which are extremely favorable to the development of mathematical abilities.

Cooperative learning takes a kind of constructivist approach, the idea being students constructing their own meaning through hands on activities, often with manipulative and opportunities to experiment.

PROCEDURE OF COOPERATIVE LEARNING METHOD-

Creating situation: - In this step teacher creates the proper situation to the students in the class. He puts up the knowledge about the method procedure, steps and uses to the students.

Selection of the problem: - The teacher helps the student to select the problem and guide them. Students are having freedom to choose the topic or problem based on their interest and ability.

Planning:-The teacher discuss with the students about the problem in various angles and points. After the free expression of the student's opinion about the problem, the teacher writes down the whole programme of action stepwise on the blackboard. In the process of planning teacher has to act only as a guide and should give suggestions at times but actual planning be left to the students.

Execution: - The students start their work with cooperation. They are collecting and sharing the relevant information and materials with each other. Teacher should give the time and right to the students according to their own, speed, interest and ability. During this step the teacher should carefully supervise the pupils in manipulative skills to prevent waste of materials and to guard accidents.

Evaluation: - Evaluation of the work should be done both by the pupils and the teachers here the students evaluating their task. They determine whether the objects are achieved or not.

RATIONALIZE OF THE STUDY

In giving or receiving answers only without help from others is not positive for student's achievement. Although there are many different forms of cooperative learning, all of them have only one purpose that involves having work together to help each other in order to complete their goals. Some students in this study said that the complex concept or different problem become easier when they learn Mathematics by using Cooperative learning strategy. One of the reasons to promote performance may be that students get help through discussion to create peer support and expand deep thinking and perspective with other group members. In addition to prompting Mathematics achievement, there was other finding from the analysis of Cooperative learning in Mathematics instruction. Increase social communication, changing learning behaviors and self-esteem because of getting help from others. In study of traditional and Cooperative learning methods on mathematics to learn new methods and develop the behavior of students and to make the students responsible. Cooperative small group of mathematics instruction would have strong emphasis participation, which did not often appear in traditional mathematics classroom.

STATEMENT OF THE PROBLEM

Cooperative Learning Strategy in Mathematics at Secondary level: A Study in Muzaffrnagar, Utter Pradesh, India

OBJECTIVES OF THE STUDY

Objectives of the study are mentioned below:-

- To study the mathematics achievement of 9th standard student taught by Traditional Strategy.
- To study the mathematics achievement of 9th standard student taught by Cooperative learning Strategy.
- To compare the mathematics achievement of 9th standard student taught by Traditional and Cooperative learning Strategies.
- To compare the gender wise mathematics achievement of 9th standard student taught by Traditional and Cooperative learning Strategies.

HYPOTHESIS

- There is no significant difference in mathematics achievement of 9th standard Male students taught by traditional and cooperative learning strategies.
- There is no significant difference in mathematics achievement of 9th standard Female students taught by traditional and cooperative learning strategies.
- There is no significant difference in mathematics achievement of 9th standard students taught by traditional and cooperative learning strategies.

DELIMITATIONS

The present study will be delimited to 9th standard student of Secondary Schools of district Muzaffarnagar, Utter Pradesh, India

RESEARCH DESIGN

In present study, the researcher has been selected experimental design to study the mathematics achievement taught by traditional and cooperative learning strategies.

Population and Sample: - all the students studying at 9th standard of Muzaffarnagar District are the population and 120 students have taken as sample.
Variables: - The Present study involved two variables i.e. Dependent variable and Independent variable**.**
Independent variables: Traditional strategy, Cooperative learning strategy
Dependent variables: Mathematics achievement.
Tool used: - Mathematics Achievement Test (MAT)

ADMINISTRATION OF TEST

Phase 1:- previous mathematics achievement of selected sample for experimental work.
Phase 2:- Administration of the Pre-Experimental achievement test. This phase involved administration of the achievement test to the students of the experimental group. Separate response sheets were provided which were scored with the help of scoring key.
Phase 3:- Conducting the instructional programs. This instructional treatment was manipulated in the form of teacher directed instruction followed by co-operative learning setting to the experimental group, whereas the control group was taught through conventional method.
Phase 4:- Administration of the Post-experimental achievement test. After the instructional treatment of 28 working days, achievement test was administered to both the experimental and group to know the effect of treatment

DATA COLLECTION FOR THE STUDY

The following data were collected for carrying out the present investigation-

- Gender wise achievement scores of the student.
- Scores of the students related to control group and experimental group.

STATISTICAL TECHNIQUES USED

- Mean and standard deviation
- T-test for measuring the significant difference between means.

Analysis and Interpretation of data

Table-1.1: Mathematics achievement of Male students taught by Cooperative learning strategy and traditional strategy.

Group	N	Mean Score	S.D.	DF=58	r = 0.1	t-value=4.32	Significance
Experimental	30	21.9	4.8				Significant
Control	30	27.1	5.3				

Table 1.1 present the results of statistical comparison of Male students of control group (N=30) and experimental group (N=30) on achievement in mathematics. On achievement in mathematics the mean score of male student of both groups were compared by using t-test which was found to be significant at 0.05 and 0.01 level.

These results led to conclusion that there is significant difference between both groups of male students.

Table-1.2: Mathematics achievement of Female students taught by Cooperative learning strategy and traditional strategy.

Group	N	Mean Score	S.D.	DF=58	r = 0.1	t-value=4.32	Significance
Experimental	30	21.9	4.8				Significant
Control	30	27.1	5.3				

Table 1.2 present the results of statistical comparison of Female students of control group (N=30) and experimental group (N=30) on achievement in mathematics. On achievement in mathematics the mean score of female student of both groups were compared by using t-test which was found to be significant at 0.05 and 0.01 level.

These results led to conclusion that there is significant difference between both groups of female students.

Table-1.3: Mathematics achievement of students taught by Cooperative learning strategy and traditional strategy.

Group	N	Mean Score	S.D.	DF=118	r = 0.1	t-value=4.32	Significance
Experimental	60	21.9	4.8				Significant
Control	60	27.1	5.3				

Table 1.3 present the results of statistical comparison of students of control group (N=60) and experimental group (N=60) on achievement in mathematics. On achievement in mathematics the mean score of student of both groups were compared by using t-test which was found to be significant at 0.05 and 0.01 level.

These results led to conclusion that there is significant difference between both groups of students.

FINDINGS

Findings of the study are as follows:

- There is significant difference between control and experiment groups of male students of 9th standard on mathematics achievement.
- There is significant difference between control and experiment groups of female students of 9th standard on mathematics achievement.
- There is significant difference between control and experiment groups of students of 9th standard on mathematics achievement.

The results reflect that after applying cooperative learning strategy on experiment group, they achieve more marks in the comparison of control group. Also high achiever and low achiever of experiment group score more marks in the comparison of control group. Thus cooperative learning strategy is more effective than traditional strategy in mathematics teaching.

EDUCATIONAL IMPLICATION

A research study is meaningful if and only if the present study, attempt has been made to study the effect of cooperative learning method on student's academic achievement in mathematics from the present study the investigator has found out the following educational implication from the findings:

- Students can be given tasks to discuss, problem solve and accomplish like quizzes, riddles and puzzles.
- The present study suggests teachers distribute and collect the material for the group. Instead of dealing with such students, he has to deal with 06 group facilitators. This saves a lot of time and energy.
- The present study shows that students make connections between the concrete and abstract level of instruction through peer interactions and carefully designed activities.
- The present study tells that teacher should design activities to promote mathematics understanding by having students practice, manipulate reason and problem solve.
- The present study shows that students today seem to have a much shorter attention span than they did a year ago with cooperative learning used on regular basis, they are likely to become restless or misbehave during a teacher-directed part of a lesson since they know they will have time in groups.
- The present study shows that shy students are more likely to ask and answer questions in a group setting. The same is true for low-skills students.

ACADEMIC BENEFITS

I. Benefits to the learner:

- It makes the students responsible for their learning.
- It helps the students in developing higher order thinking skills, critical thinking arid oral communication skills.
- In involves student's activity to the teaching learning process.
- It helps the weaker students in improving their performance when grouped with higher achieving students.
- Students get opportunity for deeper understanding and insight into the subject matter as a result of discussing and teaching the material learned by them with their peers.
- It helps in promoting leadership skills among students.
- Slow learner students have made consistently favorable achievement in cooperative classes.
- It is helpful in the development of several social qualities and virtues among the students for becoming on adjusted social being.

II. Benefits to the Teacher:

- It helps in promoting leadership skills among students.

- . It helps in improving classroom results by making the students more involved, motivated and willing to learn and achieve the learning targets more and more by providing an anxiety free, non-competitive, stimulating environment
- It is helpful in the development of several social qualities and virtues among the students for becoming on adjusted social being.
- It helps in providing an interactive model for the classroom teaching in place of one-sided teacher dominated lecture or demonstration method.

III. Psychological Benefits:

- Cooperative learning encourages students to seek help and accept tutoring from the peers. It provides a sense of security that is almost endangered in competitive traditional classroom environment.
- Cooperative learning helps in developing healthy interaction among the students and between the teacher and students. Students acquire quite healthy and positive attitude towards each other and to their teachers who are always ready for helping them in their learning tasks.

IV. Social Benefits:

- In Cooperative learning, the students get a healthy positive atmosphere for modeling and practicing cooperation and consequently, they are of getting and giving proper cooperation can be properly learnt through the practice of cooperative learning.
- It helps in promoting group skills among students.

SUGGESTION FOR FURTHER STUDIES

- The study may be conducted at different levels i.e. secondary, higher secondary and university level of education.
- The study can be carried out by taking account the boys and girls separately.
- Mathematics laboratory should be designed for use. These laboratories should be designed to provide group learning.

REFERENCES

Akinsola, M.K. (2007). The effect of simulation games environment on students, The Turkish online Journal of Educational Technology, Vol. 6.

Ali, Riasat & Akhtar, Aqua (2011). The impact of motivation on student academic achievement in mathematics in problem based learning environment, International Journal of Academic Research, Vol. 3.

Anice, James (2006). Technique of Mathematics (edition-I), New Delhi: Neel Kamal Publication.

Gilles, R.M. & Adrian, F.(2003). Cooperative Learning: The social and intellectual Outcomes of Learning in Groups, Farmer Press, London.

Gillies, R.M.(2000).The maintenance of cooperative and helping behavior in cooperative groups, British Journal of Educational Psychology, Vol. 70.

Kaj, D.K. (1990). Relationship between attitudes toward Science achievement in science,Ph.D Thesis, University of Kalyani.

Kaul, Lokesh (2008). Methodology of Education Research (3rd edition), New Delhi: Vikas Publication.

Kasinath, M.H.(2003). Piagetian conservation abilities as determinants of academic achievement, Journal of All India Association for Education Research, Vol. 22, No. 1

Koirala, P. (2005). The effect of mathmagic on the algebraic knowledge and skills of low performing high school students, International Group for the Psychology of Mathematics Education. Vol. 3

Kothari, C.R. (2010). Research Methodology (2nd edition), New Delhi: New Age International Publishers.

Maqsud, Muhammad.(1998). Effects of metacognitive instruction on mathematics achievement and attitude towards mathematics of low mathematics achievers,Educational Research, Vol. 40, No.2.

Mangal, S.K. (1997), Teaching of Mathematics (3rd edition), Jalandhar: Parkash Brother Publication.

Memaster Kristen, Nyman & Fucchs, Douglas. (2002). Effect of cooperative learning on the academic achievement in Science, Journal of Science and Mathematics Education in S.E., Asia, Vol. 26 No. 2.

Quinm Zhining (1995). Cooperative versus competitive efforts and problem solving, Review of Educational Research, Vol. 65 Ne.2.

Ramsay, G.Shula and Richards, C. Herbert (1997). Cooperative learning environments: Effects on academic attitudes of gifted students, Gifted Child Quarterly, Vol.41, No. 4.

Sharan, V. (2010). Cooperative Learning for Academic and Social Grains: valued pedagogy, problematic practice, European Journal of Education, Vol. 45, No.2.

Slavin, Robert E. (1983). When does Cooperative Learning Increase Student Achievement? , American Psychological Association, Vol. 94.

Surapuramath, Kotreshwaraswamy (2010). Relationship between school climates with academic achievement of students in mathematics,International Research Journal, Vol. 1, No.11.

Zakaria, Effandi, Chin , Lu Chung (2010). The Effect of Cooperative Learning on Students mathematics achievement and attitude towards mathematics ,Journal of Social Science, Vol. 6, No.2