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EFFECTIVENESS OF COOPERATIVE LEARNING STRATEGY IN BASIC SCIENCE AT IX STANDARD LEVEL

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Abstract

*This study investigated the effectiveness of cooperative learning strategy in basic science. T*he investigator has chosen the two groups pretest-posttest equivalent-groups design used for the study. *The treatments were at two levels cooperative learning strategy (jigsaw II) and conventional lecture method (control). Basic Science Achievement Scale (BSAS) was the main instrument used to collect data from students. t-test Analysis were used to analyze the data collected. The results of this study indicated that there were significant main effects of treatment on students' achievement towards basic science.*

Keywords: *cooperative learning, effect, achievement and basic science.*

INTRODUCTION

Science education plays a vital role in the lives of individuals and the development of a nation scientifically and technologically. It is widely and generally acknowledged that the gateway to the survival of a nation scientifically and technologically is scientific literacy which can only be achieved through science education. Towards revolutionizing educational system, the Conference on Curriculum Development gave birth to the National Policy on Education which brought about significant changes to the Indian educational system. For instance, in India , the National Policy on Education (1986) provided educational expenditure in science and technology.

All the above-mentioned systems of education in India are designed with special provisions for science and technology learning in schools. More so, India Government also came up with a policy that 60 percent of the students seeking admission into the nation's Universities, Polytechnics, and Colleges of Education should be admitted for science oriented courses, while 40 percent of the students should be considered for Arts and social science courses. Basic science, formerly known as Integrated Science, is the first form of science a child comes across at the secondary school level; hence basic science prepares students at the high school level for the study of core science subjects at the high school level. This implies

that for a student to be able to study single science subjects at the high school level successfully, such student had to be well grounded in basic science at the high school level. In view of this, basic science is given great emphasis in the high school curriculum.

Need for the Study

This study explores of students toward science, their interest, motivation and satisfaction with the subject at school in different parts of the world. This study is the problem that the number of students who are taking science subjects at secondary and high school level is declining and most of them discontinue studying science whenever they have a choice. Student's interest in school science is declining with an accompanied declining number of students taking science, which consequently causes shortage of science literates in different science-based professions. The enrolment rates in the natural sciences have been steadily declining in India as well as nearly every country in the world. So, it is the need of the day to get a broader picture of the reasons that hinder learners from entering this field and developing a less positive attitude over time. So the present investigation was undertaken

Operational Definitions of the Key Terms

Co-operative learning

Cooperative learning is the umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together

Cooperative Learning Strategy

Cooperative learning strategy involves a situation in which students work together cooperatively and interdependently in small groups towards a group goal.

Basic science

It refers to the scientific disciplines of Physics, Chemistry and Biology as well as to their sub-disciplines. The principal idea behind something being labeled as basic science is that study of basic science leads to a better understanding of natural phenomena.

OBJECTIVES OF THE STUDY

The following are the objectives of the study.

1. To find out the effectiveness of Cooperative Learning Strategy in science teaching.
2. To find out the achievement mean scores of the pre-test and post test scores of control group student.

3. To find out the achievement mean scores of the pre – test and post – test scores of experimental group students.
4. To find out and compare the mean scores of the control and experimental group students in their gain scores.

HYPOTHESES OF THE STUDY

The following are the hypothesis of the study:

1. There is no significant difference between the achievement mean scores of the pre-test and post – test scores of control group students.
2. There is no significant difference between the achievement mean scores of the pre-test and post-test scores of experimental group students.
3. There is no significant difference between the mean scores of the control and experimental group students in their gain scores.

DESIGN OF THE STUDY

Experimental design is the blue print of the procedures that enable the researcher to test hypotheses by reaching vivid conclusions about relationships between independent and dependent variables. In this experimental research, the investigator has chosen the two groups pretest-posttest equivalent-groups design for her study.

The pretest-posttest equivalent groups design is

R O_1 X O_2	X gain = $O_2 - O_1$	O_1 O_3 – Pre tests
R O_3 C O_4	C gain = $O_4 - O_3$	O_2 O_4 – Posttests

In this experimental method two groups of subjects are selected. One of the equivalent groups serves as the control group in which the subjects are taught by traditional method. The other group serves as the experimental group in which the subjects are taught using Cooperative Learning Strategy.

Jigsaw II Strategy

Jigsaw II cooperative learning strategy was originally developed by Aronson and Colleagues in 1978. Jigsaw II requires students to work in group of five to six members. Each student in a group is given information to which no one else in the group has access, thus making each student "expert" on his or her section of the subject matter. After receiving their assignments, each team member reads a section. Next, members of different teams who have studied the same sections meet in "expert groups" to discuss their sections. Then the students return to their original teams and take turn teaching their team mates what they have learnt. All

students in a group are expected to learn all the subject matter assigned to members of their group.

After the small group instruction, students are tested on the subject matter and receive individual grades or other rewards. The afore-mentioned Aronson's version of Jigsaw does not meet Slavin's effectiveness requirements because it incorporates neither a group goal nor individual accountability for contributing to the achievement of a group goal. Slavin, in 1986, developed a variation of Jigsaw called Jigsaw II. Like Aronson's Jigsaw, each student in Jigsaw II, after preparing in an "expert group, teaches his/her peers a part of the subject matter. After instruction in Jigsaw II, teachers test students individually and produce team scores based on each student's test performance. The control group was taught by conventional method (i.e.) lecture method. Both the groups had same number of students and they were given equal time for each session. The treatment was given for 30 days with a schedule of one hour per day for each group and no students were absent on those days. The treatment was given without any disturbances.

SAMPLE

The sample for the present study constitutes 60 IX standard Students CK School of practical knowledge Matric higher secondary school in Cuddalore were selected.

Tool used for the Study

The investigator has used Basic Science Achievement Scale was the main instrument used to collect data from students (BSAS) (2019).

DEVELOPMENT OF ACHIEVEMENT TEST

The achievement test in science consists of 50 items from physics, chemistry and biology. Among them 15 questions are knowledge level, 20 questions are understanding level 15 questions are application level. The questions are of multiple choice category having four alternatives. Students have to choose the answer as a or b or c or d in the answer sheet. The total score of the test was 50. For each correct answer, the score is one. For each wrong answer the score is zero.

STATISTICAL TECHNIQUES USED

Different analysis method was used for data analysis. It provided inferences involving determination of statistical significance of difference between groups with reference to selected variables. Mean, standard deviation and 't' test were used for this purpose.

Hypothesis: 1

There is no significance difference between the control group and experimental group students in their mean scores of pre test.

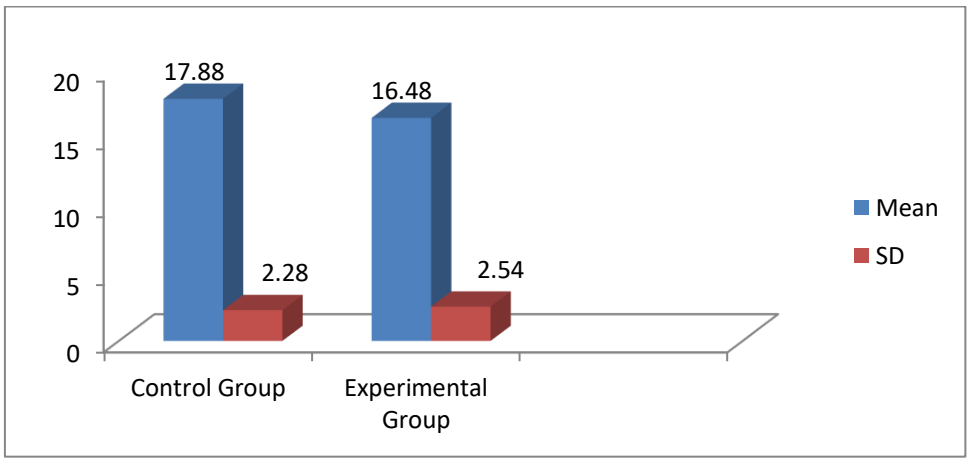
Table .1

Difference between the Mean Scores of Pre Test of Control Group and Experimental Group

Group	Number	Mean	SD	't' Value		Remarks at 0.01 level
				Calc.	Table	
Control	30	17.88	2.28	0.58	2.71	N.S.
Experimental	30	16.48	2.54			

The above table shows that the computed t value 0.58 is less than table value 2.71 at 0.01 level and hence it is not significant. Consequently, the null hypothesis is to be accepted. So there is no significance difference between the control group and experimental group students in their mean scores of pre test.

Figure.1 Mean Scores of Pre Test of Control Group and Experimental Group



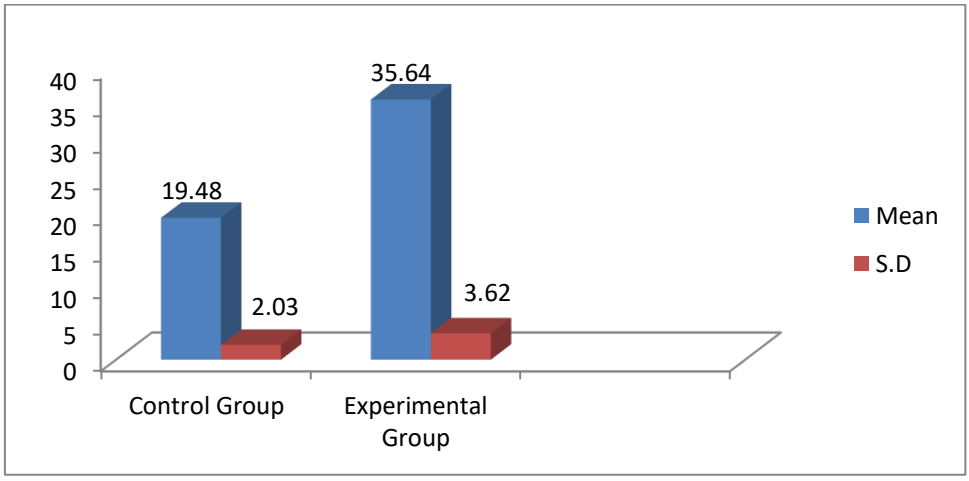
Hypothesis:2 There is no significance difference between control group and experimental group students in their mean scores of post test.

Table .2 Difference between the Mean Scores of Post Test of Control Group and Experimental Group

Group	Number	Mean	SD	't' Value Calc.	Table	Remarks at 0.01 level
Control	30	19.48	2.03	11.35	2.71	S
Experimental	30	35.64	3.62			

The above table shows that the computed't' value 11.35 is greater than the table value 2.71 at 0.01 level and hence it is significant. Consequently, the null hypothesis is to be rejected. So there is significance difference between control group and experimental group students in their mean scores of post test.

Figure.2 Mean Scores of Post Test of Control Group and Experimental Group



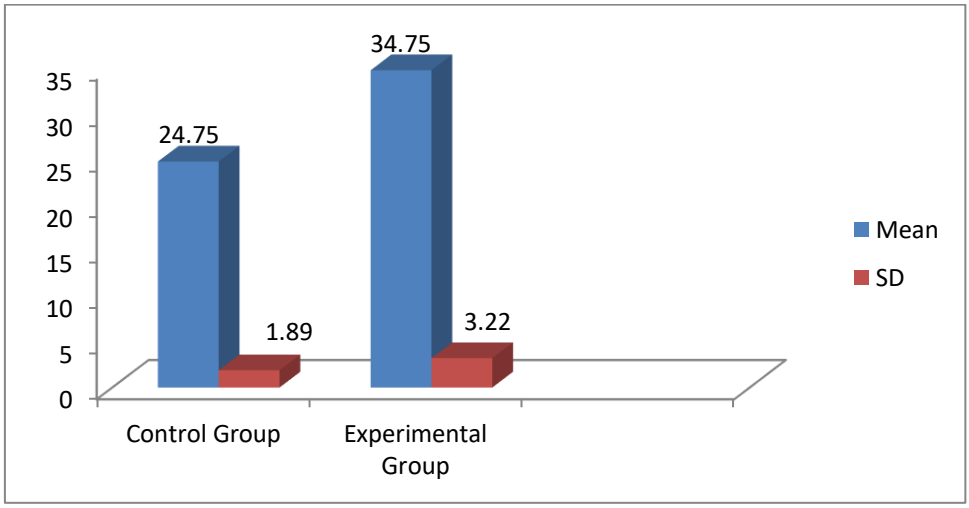
Hypothesis: 3 There is no significance difference between the mean scores of gain scores of control group and experimental group students

Table .3 Difference between the Mean Scores of Gain Scores of Control Group and Experimental Group

Group	Number	Mean	SD	't' Value Calc.	Table	Remarks at 0.01 level
Control	30	24.75	1.89	8.08	2.71	S
Experimental	30	34.75	3.22			

The above table shows that the computed't' values 8.08 is greater than the table value 2.71 at 0.01 level and hence it is significant. Consequently, the null hypothesis is to be rejected. So there is significance difference between the mean scores of gain scores of control group and experimental group.

Figure.3 Mean Scores of Gain Scores of Control Group and Experimental Group Students



Educational implications and Recommendations

This study has very important contributions and high implications for the educational practices in India. This study revealed that students in the cooperative learning strategy (Jigsaw II) group had high mean scores than the students in the conventional-lecture group. Jigsaw II cooperative learning strategies was found to be more effective in enhancing students' achievement toward learning basic science more than the conventional-lecture approach. When friendliness is established, students are motivated to learn and are more confident to ask questions from one another for better understanding of the tasks being learnt. Hence this motivates them to attend basic science classes regularly Based on the findings of this study, the following recommendations were made:

1. Basic science teachers should adopt cooperative learning strategies in order to enhance students' achievement toward learning basic science.

2. At the pre-service level, the use and implementation of cooperative learning strategies in the classrooms should be emphasized in the methodology courses being offered by the Student-teachers; and

3. At the in-service level, seminars and workshops should be organized by ministry officials, zonal educational authority, and local educational authority in order to educate practicing teachers on how to implement cooperative learning strategy in schools at all levels.

DISCUSSION

This study was conducted to establish the effectiveness of cooperative learning strategy on students' achievement towards basic science. From the results two teaching

strategies used had effects on the students' achievement towards basic science. There was significant difference in students' attitudes toward basic science in the two treatment groups with jigsaw II strategy having the higher positive effect, while conventional-lecture approach had the lowest positive effect. This result implies that cooperative learning strategy enhanced students' achievement towards basic science more than the conventional-lecture approach.

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