Cooperative Learning – A Strategy for Developing Positive Perception towards the Science Classroom

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Abstract
In this study pretest-posttest equivalent group design was used to evaluate the relative effectiveness of co-operative learning strategy with respect to conventional method of teaching. The effect of cooperative learning strategy and conventional method of teaching on the respective group was assessed with the help of pretesting and post testing on drawing the science classroom. Both the groups were compared by analyzing the results of drawing the science classroom. The sample consisted of 90 pair’s students of class VIII with a mean age of 13 1/2 years from three high schools of Tumkur town of Karnataka state. Cluster and random sampling techniques were adopted for the collection of data. Out of 90 pairs, 90 students were treated as experimental group and remaining 90 students were considered as control group. The tool used for this study was instruction sheet for drawing the science classroom. The comparison of pretest and posttest drawings of experimental and control group revealed that there was a difference in the experimental and control group in the representation of science classroom. These results lead to the acceptance of hypothesis that there is a difference in the drawings of experimental and control group with respect to the representation of science classroom. There was an improvement in the drawings of science class room of experimental group in comparison to control group. Drawings showed the positive changes in the students of experimental group with respect to their perception and outlook towards science classroom.

Key Words: Science Classroom, Effective Science Teaching, Cooperative Learning, Improving Student Achievement, Cognitive Skills, Tumkur Town High Schools, Karnataka
Introduction

Modern science, which began about 300 years ago, has been enlarging our knowledge of the environment at an ever increasing pace, and society has become more and more dependent on the technological consequences and advancements of science. No aspects of man's life has been unaffected by scientific developments. The advancements that are taking place in medicine, astronomy, agriculture, engineering, oceanography, aeronautics, space travel, microbiology, nuclear biology and innumerable other branches and sub-branches of scientific study are marvelous. In such an age of rapid scientific advancement, everybody must have some knowledge of science for making some effective and useful contribution to life. Teaching science in secondary schools add to the child's store of knowledge about himself, his environment and his world. It gives the child an insight into the structure of science, enables the child to learn key concepts and their relationships to each other. It helps child live successfully in a changing world. Effective science teaching offers a wide variety of learning activities and experiences which can provide for the individual differences in ability, interest, and need that all children have. Some major science teaching goals at secondary stage include helping students to become scientifically knowledgeable and competent to deal with scientific issues, recognize the relevance of science to everyday living and to societal issues, communicate effectively with others about science, enjoy studying science, and finally become self-motivated life long learners. Development of positive attitude towards learning science is of central importance as a science teaching goal. There are many reform efforts now taking place to improve the teaching of science. New curricula, new methods and approaches, alternative assignments are all part of these efforts. But, still science teaching is not up to the satisfaction and is suffering from a number of defects and deficiencies. The main causes for the failure of achieving the objectives of science teaching lies in the content and methods of teaching employed in the classrooms. Content is introduced to the children in big volumes; The method employed in day to day teaching is highly routinized. Teaching of science does not go beyond the text books, does not go to environment and does not touch the heart of the children. For far too long, science education had the task of preparing stereotyped functions i.e., for a particular trade or a given job.

The most common methods of teaching science in present day schools are lecture and lecture-cum-demonstration method. Both these methods stressed only on telling, memorizing and recalling information. These methods reduce the achievement of students, does not help in enhancing social relationships, curb pupils' interest to investigate, decline the spirit of inquiry, lead to unhealthy competitive spirit. In such classrooms, students feel bored, disinterested and unhappy. These methods also develop negative attitude towards the class/subject/lesson as these methods encourage competitive learning. Hence, there is a need to find out an alternative teaching-learning strategy which would help classroom science teacher to achieve the objectives effectively. In order to make science teaching more effective in the classroom, increase the achievement of the students, improve science process skills and increase achievement motivation of the students and bring positive changes in attitude and perception towards classroom, there is a need an alternative teaching-learning strategy which is child-centered and activity-based. The term child-centeredness is a term which protests against curriculum-centeredness and subject-
centeredness. Many of the methods employed in present day schools emphasize competition rather than cooperation. Most of the times it so happens that due to strict discipline and high individual competitive spirit, students start disliking the teachers and peers, they feel disinterested in the class, dislike some subjects, develop jealousy and hate, and they are less accepted in the group. Excessive competition fail students to make grade, develop inferiority complex, make them non-achievement oriented and as a result they tend to lead frustrated lives. Many times the heightened and intense emotionality creates disequilibrium of mind, increase anxiety and tension in the children. This state of emotional set up can be lessened, the bridge between the dull and bright students can be diminished and good social relationships can be developed by adopting cooperative learning technique.

Cooperative learning may be defined as a classroom learning environment in which students work together in small mixed ability heterogeneous groups on academic tasks. Cooperative learning is viewed as a means for improving student achievement and other cognitive skills (Slavin, 1984; Parker, 1985; Brophy, 1986). Successful studies of cooperative learning have taken place in urban, rural and sub-urban schools in U.S., Canada, Israel, West Germany and Nigeria at different grade levels from 2 to 12 and in various subjects like mathematics, language arts, writing, reading, social studies and science. Cooperative learning classroom studies have found consistently that students express greater liking for their classmates as a result of participating in a cooperative learning method (Slavin, 1983; Slavin, 1990). In the present study an attempt has been made to study the effect of cooperative learning strategy on drawing science classroom. The hypothesis of the study was that cooperative learning group would improve in drawing the science classroom. Thus, it becomes clear that cooperative learning methods have their effectiveness on a wide range of outcomes. Realizing the importance and merits of cooperative learning techniques, these are to be necessarily strongly advocated in present day science teaching in order to improve both cognitive and social skills, and bring positive changes in the perception of students towards science teaching. Cooperative learning technique also helps to overcome the problems of conventional/traditional method of teaching. It provides solutions for the problems created due to excessive competition, large classes, short supply of learning materials, in multigrade teaching context and in mainstreaming handicapped students etc.

It also fosters the higher level of motivation and more interpersonal relationships, helps children to assume responsible adult roles and act on the environment relatively, reduce anxiety and ethnic tensions and increase self esteem among the students. In cooperative learning set up, when students are working together towards a common goal, academic work becomes an activity, valued by peers as it helps the team to succeed. The synergy generated in cooperative learning settings generates more intrinsic motivation than do individualistic or competitive environments. In addition to motivating the students to do their best, Slavin (1987) states cooperative learning also motivates students to help one another learn. In cooperative learning situation,

a) students are often able to translate the teacher's language into 'kid language' for one another,
b) students who explain to one another learn by doing so. When students have to organize their thoughts to explain ideas to teammates, they must engage in cognitive elaboration that greatly enhances their own understanding,
c) students can provide individual attention and assistance to one another. In a cooperative team there is a helpful, non-threatening environment in which students tryout ideas and ask for assistance and
d) when cooperative groups were used, the teacher observes the groups, analyzes the problems on which they work together and gives feedback to each group on how effectively they are working.
e) Cooperative learning environment improves higher level of thinking skills and problem solving, seeks to minimize anxiety of students and competition by creating an environment where students feel safe and learn from mistakes. According to Gilbert - Macmillan (1983) the advantage of cooperative learning groups is that they give students an opportunity to talk aloud, challenge and defend a point of view, and focus on the problem solving process rather than the answer. A student enjoy the process of learning, like the class and school better and shows interest in the subject.

2 Need for the Study

One of the most important and fundamental problem that most of the schools are facing is due to the over supply of students every year. Due to this, the classrooms are becoming more crowded. There is a short supply of teaching-learning materials, buildings, furnitures, good personnel who can adopt attractive and qualitative methods to teach science and other necessary facilities. In the classroom, while learning, all the students do not get a chance to use the materials provided by the teacher, which leads to their dissatisfaction and an unpleasant situation. Most of the teachers make the class quite uninteresting by lack of proper organization of teaching-learning process, haphazard use of audio visual aids where all the students do not get chance to see, hear, touch or feel the materials. Since the classrooms are overcrowded, teachers are not able to render individual attention and assistance to each and every student separately. As a result, pupils become unhappy, develop negative attitude towards the teacher and subjects and unwilling to attend the classes.

Research studies have revealed that already attempts has been made in western countries to find out the effectiveness of cooperative learning on achievement in science, attitudes of children toward method of instruction and social relations at different grade levels. Few studies have reported the positive effects of cooperative learning on these variables (Ameena,1993 ; Patnaik, 1993 ). Very less attempts has been made to find out its effectiveness on perception towards classroom/subject/ teacher. Hence, keeping in mind the above situations and to bring improvement in science classrooms, the present study is undertaken to see the effect of cooperative learning on drawing science classroom which shows the perception of students towards classroom with respect to conventional method of teaching.
The hypothesis of the study was Cooperative learning group would improve in drawing the science classroom. In this study, pretest-posttest equivalent group design was used to evaluate the relative effectiveness of co-operative learning strategy with respect to conventional method of teaching. Two groups of students of class VIII were selected for the study and were considered as experimental and control group respectively. Experimental group was exposed to cooperative learning strategy of "Learning Together" model (Johnson and Johnson, 1975) and the control group was taught by conventional method of teaching. The effect of cooperative learning strategy and conventional method of teaching on the respective group was assessed with the help of pretesting and post testing on drawing the science classroom. Both the groups were compared by analyzing the results of drawing the science classroom.

The sample consisted of 90 pairs students of class VIII with a mean age of 13 1/2 years from three high schools of Tumkur town of Karnataka state. Cluster and random sampling techniques were adopted for the collection of data. Out of 90 pairs, 90 students were treated as experimental group and remaining 90 students were considered as control group. Both the groups had no previous experiences of working in cooperative learning groups in their classes/schools. The tools used for this study was instruction sheet for drawing the science classroom.

3 Drawing the Science Classroom

In India, except some noted public schools, in most of the government and private schools, teachers still follow lecture and sometimes lecture-cum-demonstration method while teaching science. They are highly authoritative and rarely provide opportunities to the students to interact, to do group activities, to discuss among themselves etc. Therefore, it is very much essential to create an atmosphere in the classroom where the students would be able to learn science without tension and anxiety. While learning, there must be sufficient freedom for the students to learn by themselves involving in various kinds of activities. Hence, the method of instruction must be child-centered and activity based. There must be provision for the students to utilize the resources available inside and outside the classroom. There must be sufficient scope for learning in groups. The students are to be encouraged to interact, discuss and exchange their ideas and information with one another. Equal opportunities and encouragement should be provided to the students of various intellectual levels, castes, socio-economic status (SES), disability, etc. As a result, each and every student in the class get intellectual as well as emotional satisfaction. Activities provided must be interesting, according to the needs, mental ability, and aptitude of students, and should lead to quick and easy learning.

The role of the teacher in the better science classroom is that he/she should act as a guide meeting students' intellectual and social needs. He/she should be skilled enough to create a lively atmosphere inside the classroom. The teacher's role should not be confined to mere teaching as in conventional method, on the other hand, he/she should reach to each and every student, interact
with them, encourage them to participate actively in their work, clarify doubts, monitor their progress, recognize the talents of each student and reward them.

The classroom where all the students are expected to learn science should be displayed by various kinds of charts, maps, pictures, figures etc., which would draw the attention of the students and help them to learn. Teacher while clarifying the doubts and consolidating the main points should make use of such maps and charts. There should be sufficient usage of blackboard while explaining, summarizing etc. Specifically, in science classes, blackboard should be used to a greater extent to draw sketches, diagrams, graphs and to write symbols, formulae, equations etc. Such a classroom impress and help students to perceive that their learning would be better and they develop interest and liking towards their class/subject/teacher. In other words, a better science classroom is one where there is an active involvement of all the students and teacher in learning process, more availability of resources and proper utilization of them in learning science, more usage of blackboard and teaching aids in the classroom, the students feel happy and enjoy the process of learning science. Finally, a better science classroom is one which satisfy the personal, psychological, intellectual and social needs of the students and make them actively involved during learning irrespective of intelligence, socio-economic status (SES), caste, disability etc. Keeping in mind the above points, both experimental and control group students were asked to draw their science classroom before and after treatment to find out the effect of cooperative learning and drawing the science classroom.

4 Instruction Sheet for Drawing the Science Classroom

The instruction sheet was developed by experts of NCERT (1993). It mainly focused on measuring the outlook of the students towards their classroom and teacher. The students were asked to read the instruction sheet and draw whatever and however they feel about their classroom without feeling shy.

Having collected the drawings, the profile of drawing the science classroom was used to analyze the drawings keeping in mind the details of the figurative descriptions of the science classroom. The profile consisted of 3 major items of drawing the science classroom. They were a) teacher teaching, b) objects in the classroom and c) children in the classroom. Each item again was analyzed by its sub-items. During analysis, explanations of each item/sub-item were read from the profile and tallies were put against each item/sub-item. Finally, tallies were counted for sub-items of each item for all the students.

5 Conclusion

The comparison of pretest and posttest drawings of experimental and control group revealed that there was a difference in the experimental and control group in the representation of science classroom. These results lead to the acceptance of hypothesis that there is a difference in the drawings of experimental and control group with respect to the representation of science classroom. There was an improvement in the drawings of science classroom of experimental group in comparison to control group. Drawings showed the positive changes in the students of Cooperative Learning – A Strategy for Developing Positive Perception towards the Science Classroom
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experimental group with respect to their perception and outlook towards science classroom. In drawings of experimental group it is observed that their representation of the classroom has improved depicting certain important aspects which would make science classroom more effective. Earlier to this study, Ameena (1993) and Patnaik (1993)'s studies revealed that cooperative learning had brought about positive changes in the drawings of the students. Both the studies showed the improved perception of the students toward their class/subject/teacher. The results of the present study are also favoring the results of the earlier studies.

Keeping in mind the advantages of cooperative learning and also its effects on various outcomes viz., cognitive and social skills, and on affective domain, it is suggested to be included as a methodology of teaching in teacher training programme.

6 References


