ISSN 2278-8808
An International Peer Reviewed
SCHOLARLY RESEARCH JOURNAL
FOR INTERDISCIPLINARY STUDIES

Application of Co-operative Learning Approach for Triangle Construction

Damle Seema Vivek
Oak Sharmishtha Chinmay

ABSTRACT

Application of co-operative learning approach for triangle construction. Cooperative learning is more elaborate than group work activity. If we train our students to work effectively in groups, the results can be a very productive and fun learning environment. Objectives: 1) to implement co-operative learning approach for learning triangle construction 2) to study the effectiveness of co-operative learning approach for learning triangle construction research methodology Sample 60students of 9th standard from modern high school, pune. Scope_and_limitation- this research is applicable for 9th std. Students. Research is limited to modern high school 60 9th std. Students in pune. Methodology- experimental tools_- a) pretest-post test b) programmed learning material. Yield of research through this research researchers will try to study the effectiveness of co-operative learning approach.

INTRODUCTION

"Mathematics is the key and gate of all sciences" – Roger Bacon

Mathematics is important for developing various abilities like scientific thinking, logical ability, abstract thinking and all round development of a student. But it is observed that it is one of the fear factors for students especially about geometry.

When we think about geometric constructions, students are lagging behind because of lack of comprehension. The root cause for this is the misconception of basic geometric concepts.

Many new methodologies and techniques are invented to solve this problem still it is the need of time to find more solutions so that mathematics will not be a burden anymore for the students

Considering the problem we have decided to use the co-operative learning approach.

Cooperative learning is more elaborate than work group activity. Cooperative learning can be incorporated into your classroom management system. If you train your students to work effectively in groups, the results can be a very productive and fun learning environment.

Cooperative groups encourage interaction. It seems to have resulted in higher level reasoning more frequent generation of ideas and solutions. According to National Council of teacher of Mathematics communication is essential part of mathematics education.

When implementing cooperative learning in groups social skills and personal interactions are taught. Cooperative learning gives support, encouragement and makes academic progress cognitively and socially.

Five basic and essential elements to cooperative learning:

1. Positive interdependence

- Students must fully participate and put forth effort within their group
- Each group member has a task/role/responsibility therefore must believe that they are responsible for their learning and that of their group

2. Face-to-Face Promote Interaction

- Member promote each others success
- Students explain to one another what they have or are learning and assist one another with understanding and completion of assignments

3. Individual Accountability

- Each student must demonstrate master of the content being studied
- Each student is accountable for their learning and work, therefore eliminating "social loafing"

4. Social Skills

- Social skills that must be taught in order for successful cooperative learning to occur
- Skills include effective communication, interpersonal and group skills
  - i. Leadership
  - ii. Decision-making
  - iii. Trust-building
  - iv. Communication
  - v. Conflict-management skills

5. Group Processing

Every so often groups must assess their effectiveness and decide how it can be improved

In order for student achievement to improve considerably, two characteristics must be present a) Students are working towards a group goal or recognition and b) success is reliant on each individual's learning

a. When designing cooperative learning tasks and reward structures, individual responsibility and accountability must be identified. Individuals must know exactly what their responsibilities are and that they are accountable to the group in order to reach their goal.

b. Positive Interdependence among students in the task. All group members must be involved in order for the group to complete the task. In order for this to occur each member must have a task that they are responsible for which cannot be completed by any other group members

The advantages of Co-operative learning

- learners actively participate
- teachers become learners when given moment, and learners sometimes teach
- respect given to each member
- projects and questions interest and challenge students
- diversity is celebrated, and all contributions are valued
- students learn skills to resolve conflicts when they arise
- members take advantage of past experience and knowledge
- clear objectives are identified and used as a guide
- research tools such as internet access is available
- Students invested in their own learning

The disadvantages of Co-operative learning

- Some students don't work well this way
- Loners find it hard to share answers
- Bright students tend to act superior
- Aggressive students dominate

OBJECTIVES

1) To implement co-operative learning approach for learning triangle construction

2) To study the effectiveness of co-operative learning approach for learning triangle construction

FUNCTIONAL DEFINITIONS

Co-operative Learning Approach : 1)**Cooperative learning** is an approach to organizing classroom activities into academic and social learning experiences

2)**Cooperative learning** is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject.

3) The instructional use of small groups so that students work together to maximize their own and each other's learning

4) Principles and techniques for helping students work together more effectively

- **Triangle construction** In the general sense, construction means to build something. But in geometry it has a special meaning. Here, construction is the act of drawing geometric shapes using only a compass and straightedge. No measuring of lengths or angles is allowed.

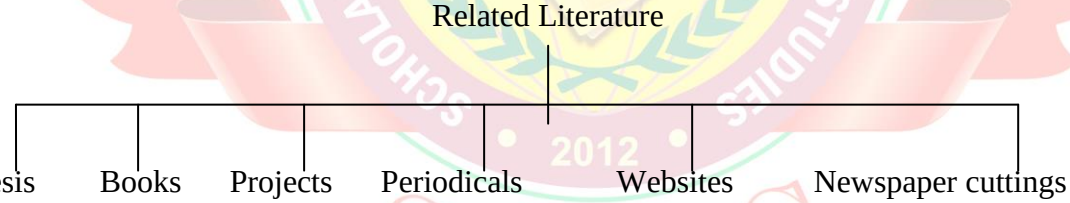
SCOPE AND LIMITATIONS

This research is applicable for 9th Standard students. The scope of this research is restricted to Modern high school Pune.

Part II

REVIEW OF RELATED LITERATURE

Researchers had gone through research work related to cooperative learning. Classification is as follows:



Related Articles

1. Research on cooperative learning
2. Cooperative learning in mathematics
3. Promoting Cooperative Learning in science and mathematics
4. Cooperative Learning: Critical Thinking and Collaboration Across the Curriculum
5. Cooperative Learning in the Secondary Mathematics Classroom
6. Facilitating student interaction in mathematics in co-operative learning.
7. Developmental and Motivational Perspectives on Cooperative Learning
8. Collaborative verses cooperative learning
9. Cooperative Learning in Mathematics: A Handbook for Teachers

10. Combining cooperative learning and individualized instruction: Effects on student mathematics achievement, attitudes, and behaviors.

Part III

Research Methodology

- **Sample and Research Methodology**

Class of Ninth 'D ' division of Modern High school , Pune was selected. Method used for sample selection was non probability based lottery method.

1) Students-60
2) Teachers-6
3) Parents-10

- **Research Methodology**

Experimental method was selected. Single group pre-test post-test design was used.

- **Tools of Research**

A) Pretest-Post test

B) Programmed learning material

C) Questionnaire-Students & teachers

D) Interviews-Parents

- **Procedure**

After finalizing the research topic the researcher approached the school authorities for getting permission.

Selection of sample

Pre-test question paper, questionnaire for teachers and students as well as interview questionnaire for parents were set.

Pre-test was conducted for 9th D

Depending on pre-test results programmed learning material was made.

Students were grouped according to the criterion of cooperative learning and instructions were given to the group leaders. The researchers assign four partners to a group. Partners were chosen mainly by ability so that each group will have one top level, two middle level and one struggling student in each group we also try to account for personality differences.

Programmed learning material was presented to the students for cooperative learning. While conducting the group activities students were observed by the researchers. More construction exercises were given for drilling.

Simultaneously questionnaires were filled by the teachers and students. Also interviews of some parents were conducted.

Post-test was conducted.

Data was analyzed

Part IV

Data Analysis

The research questions that we were trying to answer with this action research were

Will the effective use to cooperative learning groups improve achievements in mathematics?

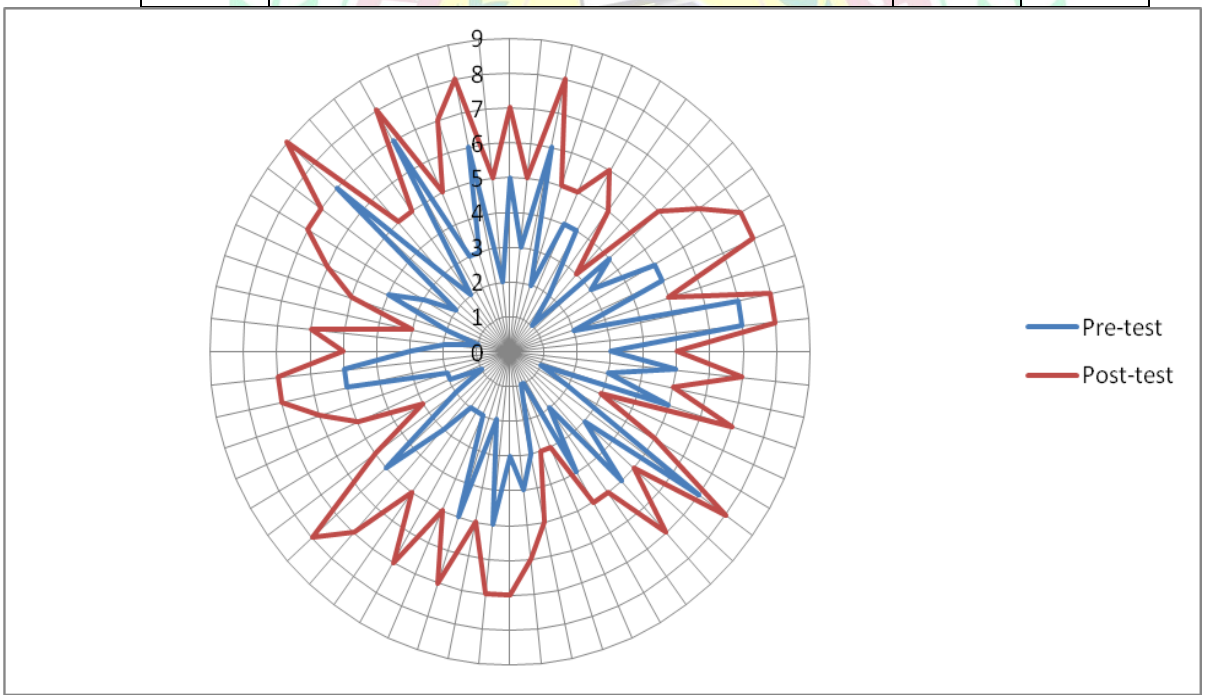
How will the use of cooperative learning groups impact individually participation in mathematics?

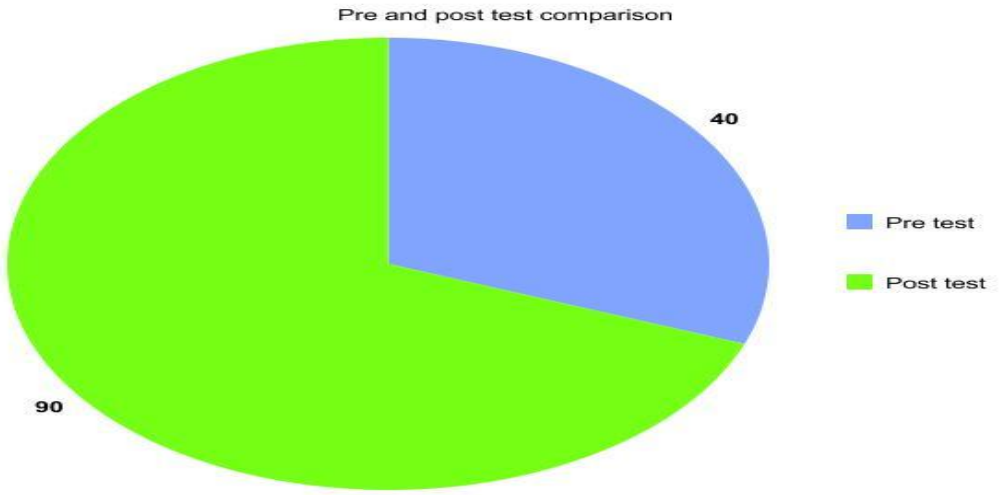
Will students' attitude towards mathematics change when they work in cooperative learning groups?

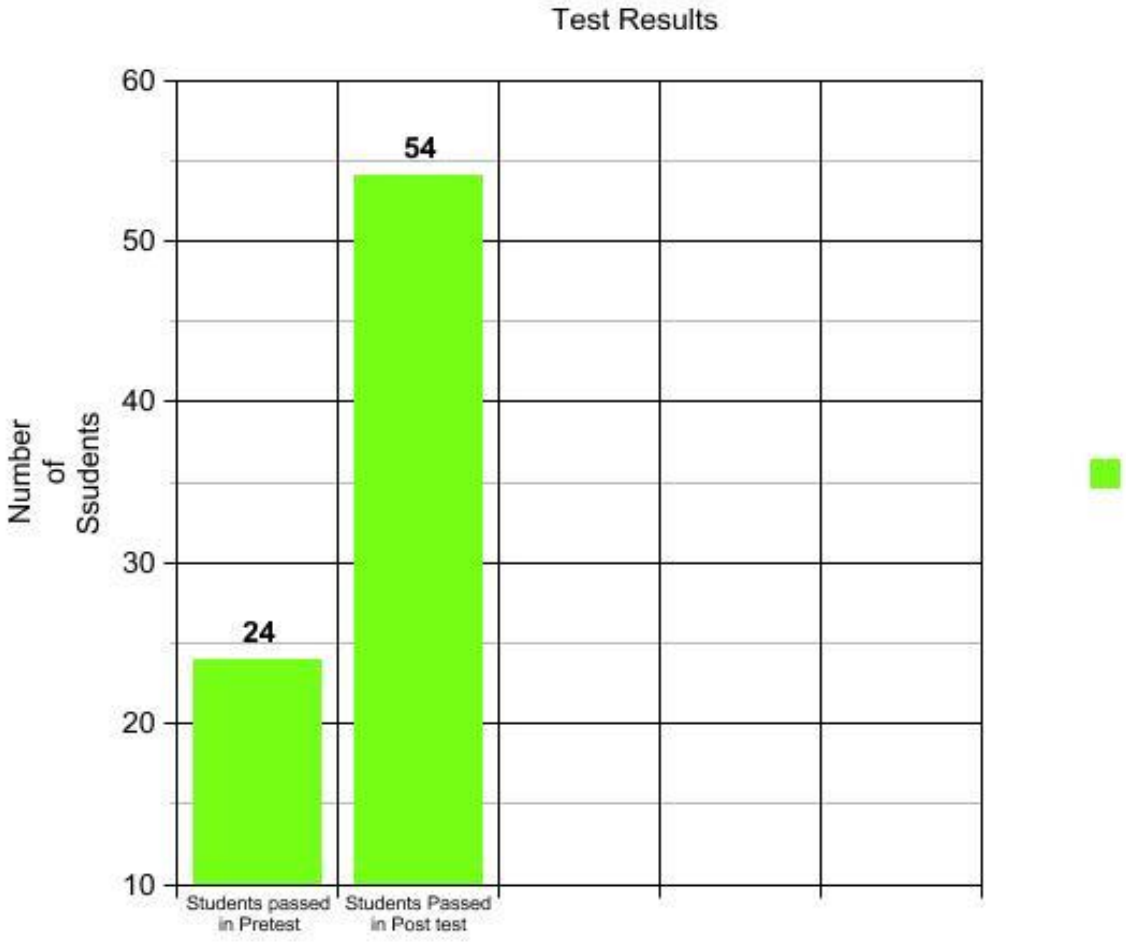
Serial no	Name	Pre-test	Post-test
1	Bahirat Pranav	5	7
2	Balwadkar Jai	3	5
3	Bhasmare Prathamesh	6	8
4	Chaskar Chaitanya	2	5
5	Deshpande Soham	4	5
6	Deval Yogesh	4	6
7	Dhore Pratik	2	5
8	Dixit Omkar	1	3
9	Gaikwad Abhishek	4	6
10	Gaikwad Kaushal	3	7
11	Gaikwad Pratik	5	8
12	Gaikwad Swapnil	5	8
13	Gawali Vaibhav	2	5
14	Gaware Anish	7	8
15	Gaware Piyush	7	8
16	Ghadge Aniket	3	5
17	Ghadge Prathamesh	5	7
18	Gurav Saurabh	3	5

19	Harip Atharva	5	7
20	Harsha Taanmay	1	3
21	Hule Pranav	2	5
22	Ingavale Omkar	7	8
23	Jadhav Siddhesh	3	5
24	Jadhav Somesh	5	7
25	Jagtap Ashtosh	2	5
26	Jangam Gaurav	4	5
27	Kadam Vaibhav	1	3
28	Kagda Govind	1	3
29	Kakade Akshay	3	5
30	Kardekar Omkar	4	6
31	Kawade Atharva	3	7
32	Karkar Jayesh	5	7
33	Khasase Nishant	2	5
34	Khopatkar Shardul	5	7
35	Kondhare Heramb	2	5
36	Kopnar Sanket	2	7
37	Kore Suraj	2	5
38	Kumavat Omkar	3	7
39	Lokhande Vaibhav	5	8
40	Manvel Prathamesh	2	5
41	Mate Suraj	1	3
42	More Avadhoot	2	5
43	More Omkar	2	6
44	Murkute Pratik	5	7
45	Nalavade Sidharth	5	7
46	Nanaware Rohit	3	5
47	Nikam Nikhil	2	6
48	Nikam Yashraj	1	3

49	Pardeshi Rohan	2	5
50	Pardeshi Rohit	4	6
51	Pardeshi Suraj	3	7
52	Patil Ajay	2	7
53	Patil Shubham	7	9
54	Pawar Shubhankar	3	5
55	Rajale Omkar	2	5
56	Ramtirthankar Kedar	7	8
57	Rane Gaurav	3	5
58	Shinde Abhijit	3	7
59	Shinde Prashant	6	8
60	Shinde Vishal	2	5




Pre and post test comparison
40
90
Pre test
Post test


Test Results
Number of Ssudents
60
50
40
30
20
10
54
24
Students passed in Pretest
Students Passed in Post test

Part V

Conclusions and Recommendations

Root causes of problem

- Students are weak at basic concepts.
- Students cannot complete the triangle construction in time.
- Construction steps are not clear to students.
- Drilling of construction is not done

Solutions

- Basic concepts about triangle construction made clear with cooperative learning
- More practice given to students in groups.
- Construction steps made clear with the help of programmed learning cards .
- Drilling was done by giving test.

Conclusions

1. 60% of students failed in pretest
2. Teachers are bothered about progress of students
3. Teachers need training to minimize failure.
4. Parents are aware about progress of their child.
5. Parents are also trying their best to help their child.
6. Only 10% students failed in post test.
7. After co-operative learning students got idea about construction of triangle.
8. By comparison of pretest and post test researchers felt that the co-operative learning program was effective.
9. Students are also aware of lagging behind but they don't know how to cope up.
10. Program learning cards were very much effective. By using cards students' confidence level increased
11. While taking pretest students were observed by researchers students were restless and unstable.
12. Because of co-operative learning basic concepts of students about triangle construction were very clear.
13. When students interact with each other in well-structured assignments, they learn both content and group process skills better than students in traditional classrooms
14. In small groups, students can share strengths and also develop their weaker skills

15. They learn to deal with conflict. When cooperative groups are guided by clear objectives, students engage in numerous activities that improve their understanding of subjects explored.
16. Students demonstrate academic achievement
17. Cooperative learning methods are usually equally effective for all ability levels.
18. Cooperative learning is affective for all ethnic groups
19. Student perceptions of one another are enhanced when given the opportunity to work with one another
20. Cooperative learning increases self esteem and self concept
21. After cooperative learning activity students bonded together
22. The noise level was much more than we had anticipated
23. The research showed that high ability students do indeed benefited from cooperative learning groups
24. Some high achieving students do not like to work in small heterogeneous groups

Recommendations

- This study was restricted to ninth standard students but it can be extended up to twelfth standard.
- One can do the comparative study of two schools.
- Study can be concentrated on only one domain
- This project was limited for Boys students one can take girls students or coeducation.
- Scope of the research can be expanded.
- For other units of mathematics also co-operative learning approach can be used.