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Impact of Collaborative learning among undergraduate medical students.

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Abstract*: Background: Collaborative learning(CL) is a shift away from the typical teacher-centered or lecture centered milieu in college classrooms. CL is an education approach to teaching and learning that involves groups of learners working together to solve a problem, complete a task, or create a product. Objectives: To study the impact of CL on academic performance and perception among I year MBBS students. Materials and Methods: Students were divided into two groups, study group (n=50) and control group (n=50). Pretest consisting of Multiple Choice Question's(MCQ's) and Short Answer Question's(SAQ's) were given to both the groups. The study group was exposed to the CL method. After the learning is over the post-test was given to both the groups. Focus group discussion was done to the study group after the post-test. Results: The pre-test score was 8.55 and the post-test score was 12.85 which was statistically significant (p< 0.05). The perception of CL using Focus Group Discussion was satisfactory. Interpretation and Conclusion: CL leads to better achievements and thus improves the critical thinking, self directed learning, communication and leadership skills among the students.*

Key Words: *Collaborative learning(CL), learner centered, MCQs.*

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I. Introduction

Collaboration has become a twenty-first century trend. The need in society to think and work together on issues of critical concern has increased[1] shifting the emphasis from individual efforts to group work, from independence to community. [2]

Collaborative learning(CL) is a method of learning where small groups of students work jointly to improve their own and each other learning. CL is the basis in the belief that learning is most effective when students are actively involved in sharing ideas and working collaboratively to complete academic assignments.[3]

CL is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. In most CL situations students are working in groups of two or more, mutually searching for understanding solutions, or meanings, or creating a product. However practiced, CL represents a significant shift away from the typical teacher-centered or lecture-centered milieu in college. [4]

Role of students in CL

In CL, students or peers are encouraged and supported themselves, aware that the responsibilities are themselves, they employ group related social skills and evaluate their own progress. The common things are positive interdependence, equal opportunities and individual accountability.[5]

The strategies for a group proposal in CL are: work at getting good feedback, get silent members involved, confront problems, vary the leadership style as needed, work at increasing self-disclosure, summarize and review the learning from group experiences, and celebrate the group's accomplishments.[6]

Role of teachers in CL

Teachers who use CL approaches tend to think of themselves less as expert transmitters of knowledge to students and more as expert designers of intellectual experiences for students—as coaches or mid-wives of a more emergent learning process.[4] In CL, the groups must be formed by students with different level of performance.[5]

Evidences proves that shared learning gives learners an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical thinkers.[7] Proponents of CL claim that the active exchange of ideas within small groups not only increases interest among the participants but also promotes

critical thinking.[8] The benefits of CL are self esteem, security that comes from being pairing among peers and higher success rates and better achievements.[9]

II. Material And Methods

The present study was a mixed interventional study consisting of both quantitative and qualitative approach. This study was done among I year MBBS students in the Department of Physiology, SIMS & RC, Bengaluru. 100 students were randomly selected through purposive sampling technique and they were randomly divided into study group (n=50) which followed the CL method & the control group (n=50) which followed the regular tutorials. The topic selected was Gastrointestinal system. Initially both the study & control group were given pretest of 50 marks which included 30 MCQs of 1 mark each & 10 SAQ's of 2 marks each. Pretest was administered in their respective tutorial teaching hours. The response was corrected with negative marking of 0.25 marks for each wrong answer. The final marks was entered in excel sheet.

The study group were informed about the CL method by the facilitator. 50 students were divided into 10 groups and thus each subgroup had 5 students. The subgroups were given a sub topic from the Gastrointestinal system chapter in Physiology. All the 10 groups were given a week time to prepare for their subtopics with the help of a team leader. The role of a team leader is to involve all the group members in the discussion and to collect the information related to the subtopic assigned to each group. Each group will later submit the information in writing as a model answer for the sub topic assigned to them.

After a week during the tutorial session the facilitator collected the model answers from each subgroup and any one member from the subgroup was asked to present their answers to the other subgroups. Any doubts was later clarified by the facilitator. Thus all the 10 topics were presented and discussed. After 3 days a post test was administered and the marks scored by them were entered in excel sheet.

The control group was given a pretest & marks scored was entered in excel sheet. The control group was also told to prepare for all the subtopics in the Gastrointestinal system. In the next tutorial session students were called randomly to present their sub topics. After 3 days the post test was administered and the marks scored by them were entered in excel sheet.

A session of Focus Group Discussion was done for the study group to know the effectiveness of CL.

In the statistical analysis, mean and standard deviation were used to describe data. Independent t-test were used to analyze and compare the means. $P<0.05$ was considered the level of significance. Data were analysed by SPSS version (version-18.0) software.

III. Results

As shown in table-1, the mean pretest scores in the study group was 8.55 and the mean post test scores in the control group was 12.85. There was statistically significant differences in the mean pretest and posttest scores in the study group ($p <0.05$). This suggests that CL improved the academic performance of the students.

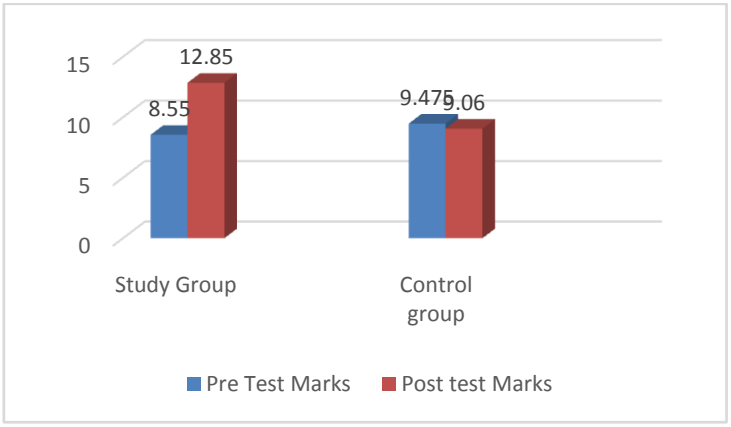
As shown in table-1, the mean pretest scores in the control group was 9.475 & post test scores was 9.06, which was statistically not significant ($p>0.05$). This showed that regular tutorials did not show improvement in the academic performance..

Table 1: Assessment of pre-test and post-testacademic scores in the study group and control group

Academic performance	Pre Test scores	Post test scores	P value
Study Group (n=50)	8.55	12.85	0.002*
Control group (n=50)	9.475	9.06	0.741

P value <0.05 Significant*, <0.001 Highly significant**.

Figure 1: Assessment of pre-test and post-testacademic scores in the study group and control group



Focus Group Discussion revealed the following elements:

- **Group learning strategy is interesting:** There was active participation of all students with good group interaction. The students utilized the time in their free time. This method also helped in improving the attention of the studens towards the topic when the group presentation was done. It also helped the students in writing the structured answers during the exams.
- **Learner's become active processors of information:** This method made the students an active learner and also motivated the other students to convert from passive learner to active lifelong learner.
- **Enhance the ability to find the information using the internet/library:** This method was resource intensive as there was active participation for the search of resource material through the use of library and internet. This method also helped the students in integrated learning by linking the topic with other preclinical subjects. Students were also eager to gather extra information of the topic from other sources with the guidance of facilitator.
- **Enhances the learner to establish a concrete action plan to achieve their learning goals:** As only one task was given, the students discussed among themselves about the marks division and appropriate content for that marks in which they choose the important points for each heading and structured answer was prepared for subtopics. They had the time to plan the action for the task assigned and to implement it properly.
- **Develops the confidence in self-directed learning:** This method helped in self-directed learning as it helps to develop confidence in the students, as all the students in the group are given chance to speak on the topic. The students in the group make an attempt to find the answers, as the question was given earlier. Even if the topic was not convered in the didactic lecture session, this method helped the students to search the answer for the assigned topic.
- **Enhances the ability to manage time effectively/Time management:** Though the method initially took more time (i.e 2 hrs) to frame the structured answers, later other students from the group referred to different resource material and help the moderator to compile a fully structured answer in less duration (30 minutes). This helped the students to assess how to write in the university exam and what to write and concentrate more on the must know and need to know aspects.
- **Helps in identifying the areas of weakness for information:** This method helped in identifying the areas of weakness concerned with each topic. Each students' helped each other in guiding themselves in the area of weakness.

Strengths of CL:

1) Improved the students in scoring during exams as the task assigned to each group covered long essays and short essays.
2) As there was detail discussion and presentation of the topic; this helped the students to write well in the internal assessment exams.
3) CL helped in motivation of disinterested students.
4) As only single topic was given at a time, this helped the students in knowing the subject in depth.

Limitations of CL :

1) Some students because of shy and reserved nature did not participate in this method.
2) It is time consuming as only single topic can be discussed at a time.

IV. Discussion

CL is a team process where members support and rely on each other to achieve a set objective. This method of learning, as an active learning strategy, continues to be an area that is increasingly receiving attention in the academic fields.[10]

CL is a learning exercise and consists of following 5 basic elements:

- Clearly perceived positive interdependence: Team members are obliged to rely on one another to achieve the goal. If any team members fail to do their part, everyone suffers consequences. Members need to believe that they are linked with others in a way that ensures that they all succeed together.
- Considerable interaction: Members help and encourage each other to learn. They do this by explaining what they understand and by gathering and sharing knowledge. Group members must be done interactively providing one another with feedback, challenging one another's conclusions and reasoning, and perhaps most importantly, teaching and encouraging one another.
- Individual accountability and personal responsibility: All students in a group are held accountable for doing their share of the work and for mastery of all of the material to be learned.
- Social skills: Students are encouraged and helped to develop and practice trust-building, leadership, decision-making, communication, and conflict management skills.
- Group self-evaluating: Team members set group goals, periodically assess what they are doing well as a team, and identify changes they will make to function more effectively in the future.[11]

CL facilitates active exchange of ideas within groups, increases motivation among participants, promotes critical thinking, fosters socialization, improves attitude towards learning, and develops a better understanding of diverse cultural background.[12,13,14] It is also evident that group learners achieve higher levels of thought and retain knowledge longer than individual learners.[15] This is because group learning enables students to participate in discussion, take responsibility for their own learning, and thus become critical thinkers.[16]

V. Conclusion

Previous research studies reveal that students working in small groups tend to learn more of what is taught and retain it longer than when the same content is presented in other instructional formats.[17,18] Group learning also promotes the development of student social skills such as communication, presentation, problem solving, leadership, delegation and organisation.[19]

The results of the present study proved that there was improved academic performance among CL groups compared to individual learning. Each member in the group, in addition to self learning, increased their understanding of concepts and ideas by explaining them to peers. Thus, each group member takes the responsibility for other members' learning and thus influencing a group success. It is also clear from this study, that students gained wide variety of values like intellectual, leadership and communication skills which further enhanced students' learning and achievement.

Limitations of the study

Further research is needed to study the impact of CL among other phases of MBBS students with larger sample size and different specialities.

Conflicts of interest

There are no conflicts of interest

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Self

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