



IMPLEMENTATION OF THE JIGSAW COOPERATIVE LEARNING METHOD AMONG UNDERGRADUATE MBBS STUDENTS

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Abstract

Background: The Jigsaw Method is a cooperative learning strategy developed in the early 1970s by social psychologist Elliot Aronson and his colleagues. It was first implemented in Austin, Texas, during a period of school desegregation when classrooms were marked by high levels of competition, tension, and social division. The method was conceptualized to reduce prejudice, foster cooperation, and improve academic outcomes by making learners mutually interdependent. The term “jigsaw” reflects the structure of the learning task as each student represents an essential piece of the whole. Learners initially work within small home groups and subsequently move into expert groups to master a specific subtopic. They then return to their home groups to teach their peers. This design promotes accountability, active participation, responsibility, and mutual respect.

Objective: To evaluate the effectiveness of the Jigsaw cooperative learning method in enhancing student engagement, collaboration, and academic achievement among undergraduate MBBS students.

Methods: This study was conducted among 200 first-year MBBS students (batch 2025–26) at GS Medical College & Hospital, Hapur. Students were divided into four batches of 50 each and further organized into expert groups of five students. The Jigsaw method was implemented during regular classroom teaching in Anatomy. Learning outcomes were assessed through achievement-based evaluation and student feedback collected via a Google Form using a Likert-scale questionnaire.

Results: The implementation of the Jigsaw method resulted in improved student participation, better conceptual understanding, and enhanced peer-assisted learning.

Keywords: Jigsaw Method, Cooperative Learning, Student Engagement, Active Learning

1. Introduction

Traditional teacher-centered instructional approaches often limit student participation, reduce interaction, and restrict the development of higher-order thinking skills. In contrast, cooperative learning strategies—such as the Jigsaw Method developed by Aronson—actively involve students by making them responsible not only for their own learning but also for teaching their peers¹. Cooperative learning typically involves small groups in which learners contribute collaboratively to achieve shared academic goals^{2,3}.

In a true cooperative learning environment, students recognize their individual roles within the group and support one another's success. Each learner's contribution becomes essential to the completion of the task, fostering interdependence and collective responsibility⁵. The present study explores the structured implementation of the Jigsaw Method among first-year MBBS students and examines its educational impact in a large-class setting.

2. Objectives of the Study

To implement the Jigsaw Method in undergraduate classroom teaching.

To promote cooperative and peer-based learning.

To analyze student engagement and collaboration during the learning process.

3. Research Design

Type of Research: Experimental / Action Research

Approach: Quantitative and Qualitative

Method: Cooperative Learning – Jigsaw Method

4. Method and Sample of the Study

The study sample consisted of 200 first-year MBBS students (batch 2025–26) from the Department of Anatomy, GS Medical College & Hospital, and Hapur. Students were divided into four batches (A, B, C, and D), each comprising 50 students, which served as home groups. Each home group was further subdivided into ten expert groups of five students each.

Topics from the thorax—specifically Mediastinum, Heart, and Lungs—were allocated to the expert groups. Students initially worked within their expert groups to master assigned subtopics and subsequently returned to their home groups to teach their peers.

Table 1. Formation of Home Groups and Expert Groups

Batch (Home Group)	Students	Expert Groups	Students per Expert Group
A	50	10	5
B	50	10	5
C	50	10	5
D	50	10	5
Total	200	40	

Table 2. Expert Groups and Assigned Subtopics

(Heart and Lung anatomy including gross features, blood supply, nerve supply, applied anatomy, radiology, Surface anatomy, pleura, Bronchopulmonary segments, and Mediastinum divisions).

Roll No 1 to 05 Roll No 51 to 55 Roll No 101 to 105 Roll No 151 to 155	A. General features of heart Position of Apex beat , base of heart
Roll No 06 to 10 Roll No 56 to 60 Roll No 106 to 110 Roll No 156 to 160	B. Internal features of atrium (Right & Left) and ventricle (Right & Left)
Roll No 11 to 15 Roll No 61 to 65 Roll No 111 to 115 Roll No 161 to 165	C. Blood supply (Venous & Arterial supply) of heart
Roll No 16 to 20 Roll No 66 to 70 Roll No 116 to 120	D. Skeleton of Heart, Nerve Supply and Valves

Roll No 166 to 170	
Roll No 21 to 25 Roll No 71 to 75 Roll No 121 to 125 Roll No 171 to 175	E. Pericardium and Applied aspect of heart
Roll No 26 to 30 Roll No 76 to 80 Roll No 126 to 130 Roll No 176 to 180	F. General features of Lung (Border, Surface & Location)
Roll No 31 to 35 Roll No 81 to 85 Roll No 131 to 135 Roll No 181 to 185	G. Pleura and Its Type Recesses with clinical importance
Roll No 36 to 40 Roll No 86 to 90 Roll No 136 to 140 Roll No 186 to 190	H. Bronchopulmonary Segments (Right and Left) with clinical importance.
Roll No 41 to 45 Roll No 91 to 95 Roll No 141 to 145 Roll No 191 to 195	I. Relations of Lung (Right & Left) Applied aspect of Lung
Roll No 45 to 50 Roll No 96 to 100 Roll No 146 to 150 Roll No 196 to 200	J. Surface Anatomy of Lung and Pleura Discuss Different Division of Mediastinum

Procedure: Implementation of the Jigsaw Method

Step1: Formation of Home Groups

Each batch consisted of 50 students. Within each batch, students were divided into ten heterogeneous expert groups of five students.

Step 2: Division of Learning Content

The selected topic was divided into clearly defined subtopics, with each student responsible for one subtopic.

Step 3: Formation of Expert Groups

Students from different home groups working on the same subtopic formed expert groups. These groups discussed, analyzed, and mastered their assigned content collaboratively.

Step 4: Peer Teaching in Home Groups

Students returned to their respective home groups and taught their assigned subtopics to peers.

Step 5: Assessment

Student participation was observed based on clarity of presentation and content understanding. Feedback was collected using a Google Form based on a five-item Likert perception scale assessing active participation and engagement.

Active Participation was measured using items likert perception scale.

5-ITEM LIKERT PERCEPTION SCALE (5-point scale)

Scale:

1 = No, I Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Yes, I Agree strongly

These are designed to measure **engagement, involvement, clarity, relevance, and satisfaction**—all aligned to the study objective (efficacy of this JIGSAW METHOD-based Google-Form assessments).

200 responses

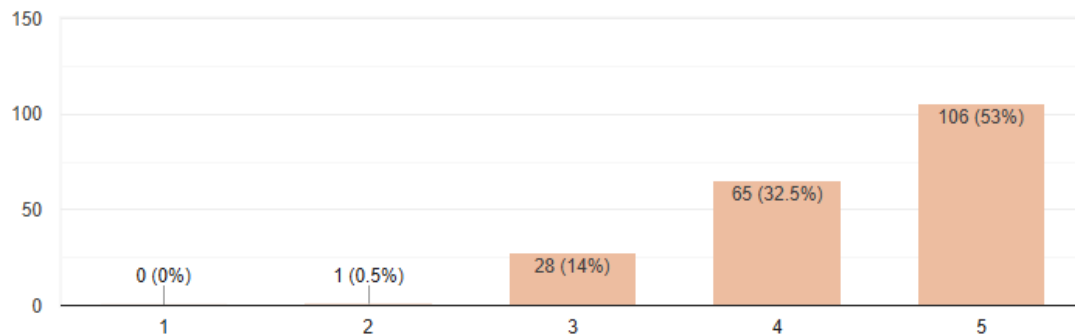


Fig – 1

Each student becomes an expert in one topic. Learning happens through peer teaching.

5. Tools Used

Achievement-based assessments.

Student feedback questionnaire (Google Form).

6. Data Analysis

Percentage improvement and levels of active participation were calculated.

Qualitative feedback was analyzed descriptively.

STUDENTS ENGAGEMENT & PERCEPTION SURVEY

A. Engagement & Involvement

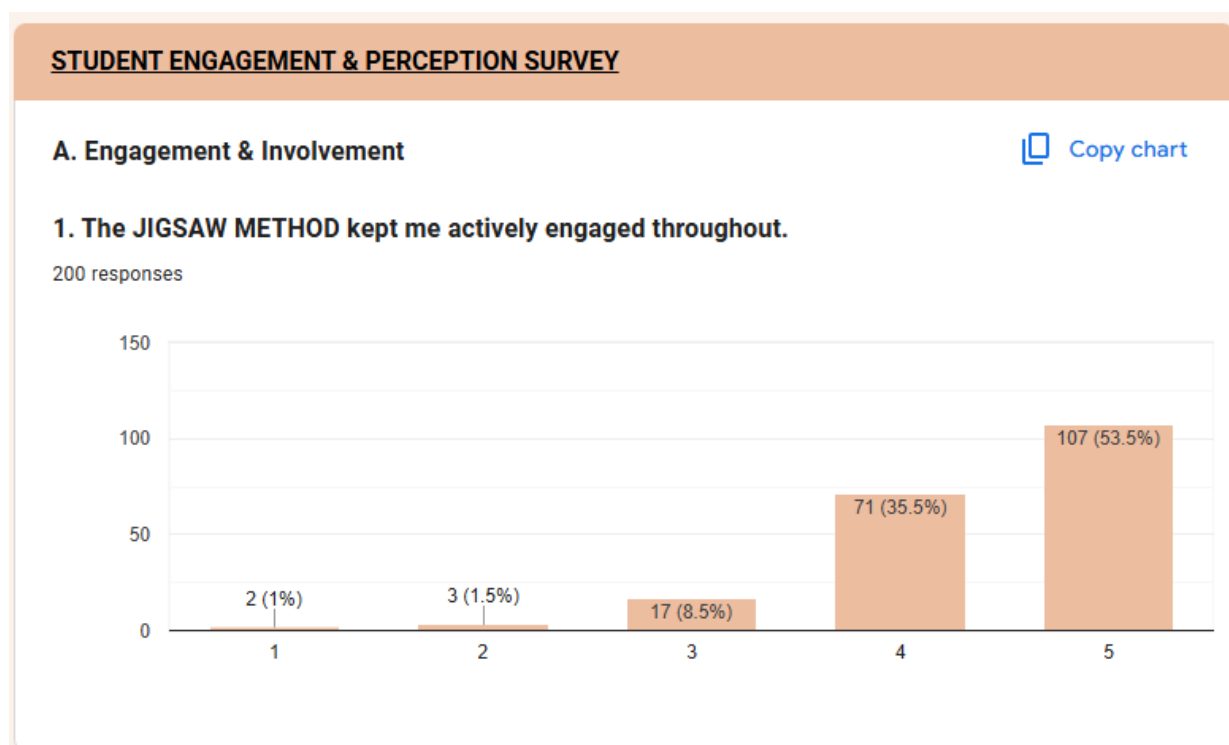


Fig- 2

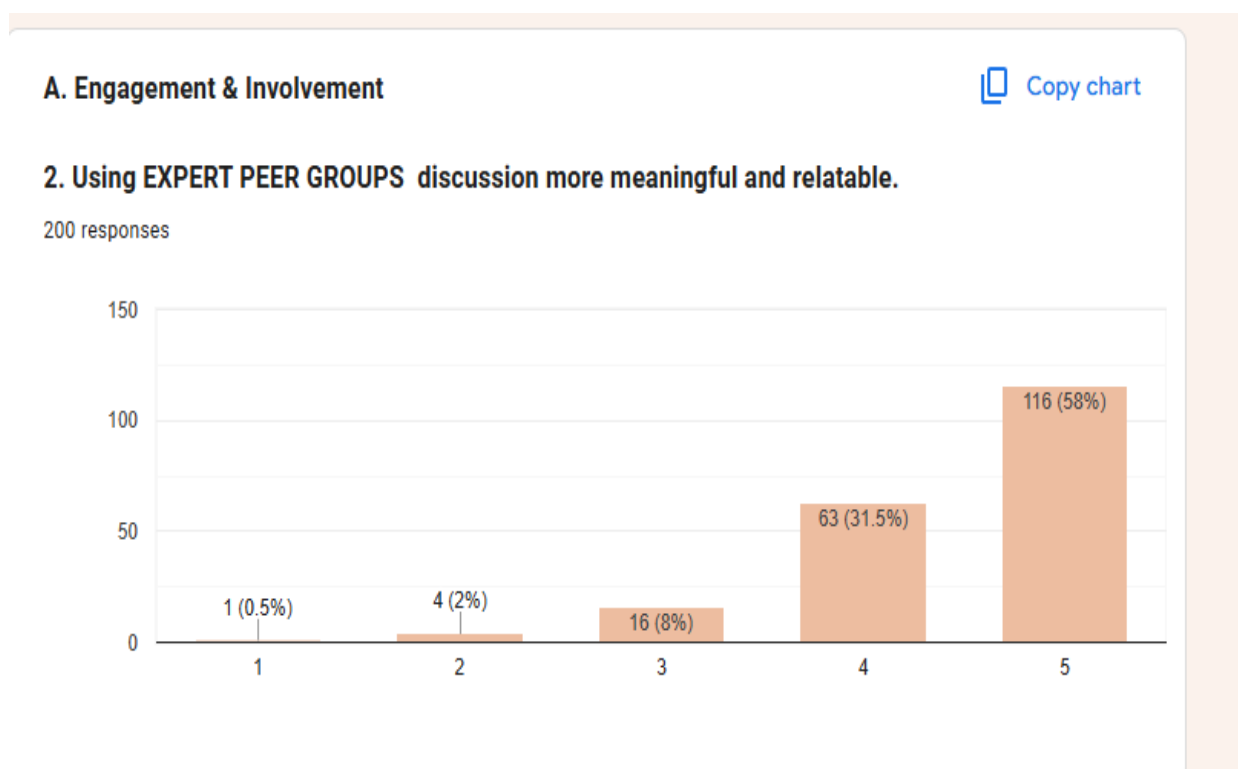


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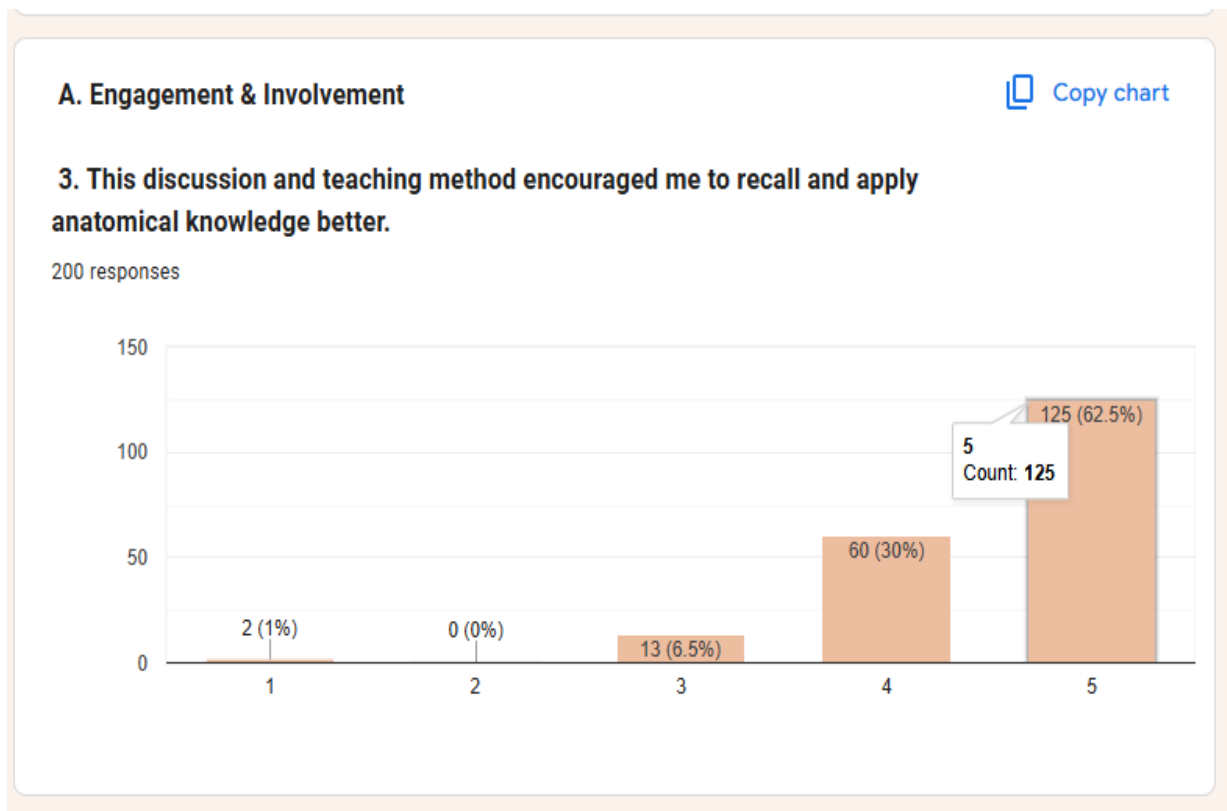


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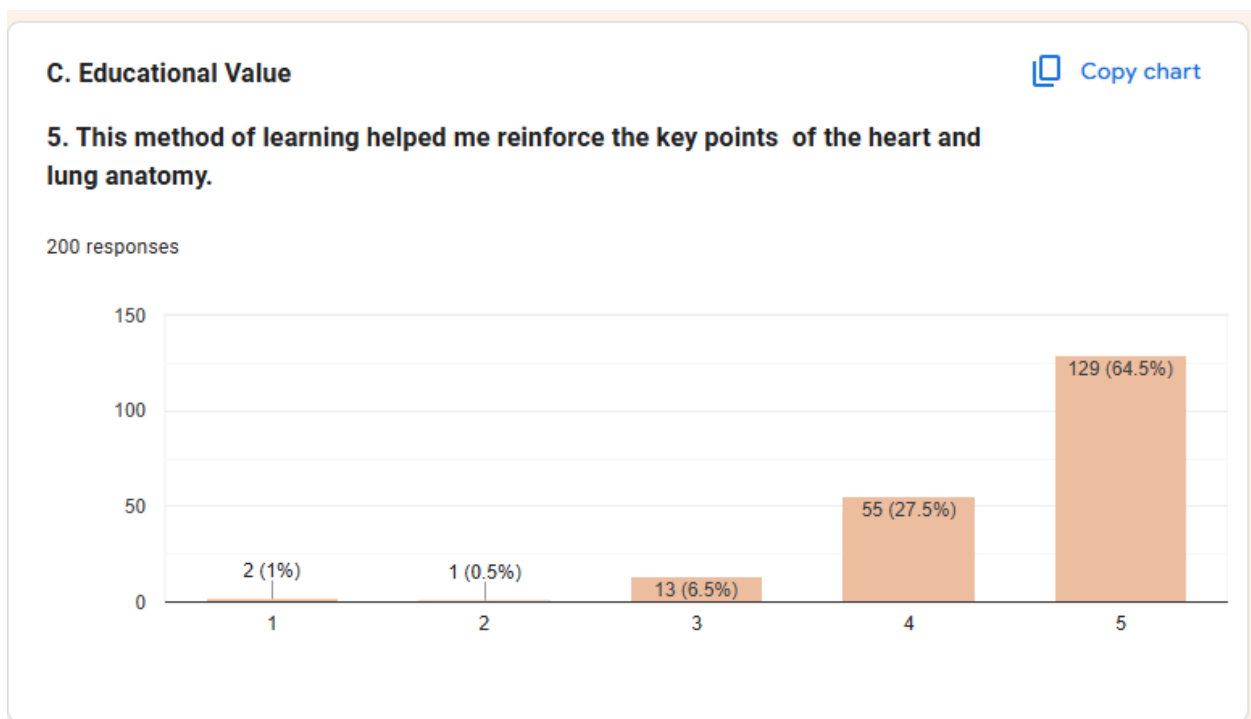


Fig- 5

D. Satisfaction & Preference

 Copy chart**6. I would prefer more such peer groups discussion method of revision activities in Anatomy.**

200 responses

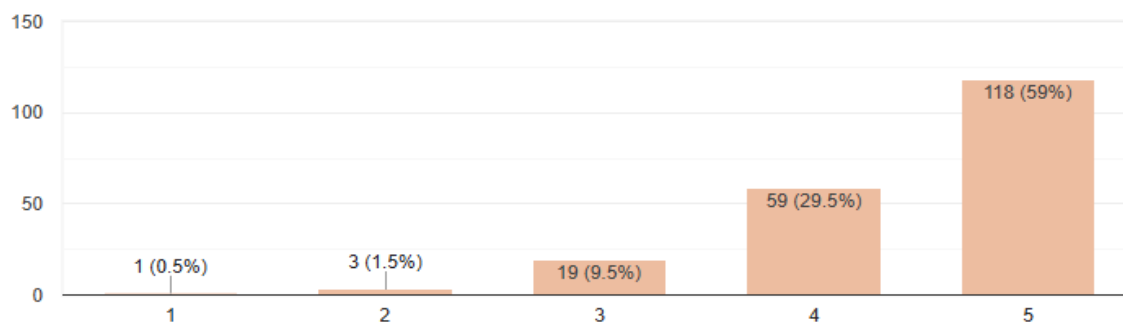


Fig – 6

Questions Responses **200** Settings**Overall, how would you rate such method of learning and assessment for helping you revise the HEART and LUNG?**

1 ★ = Poor

5 ★ = Excellent

200 responses

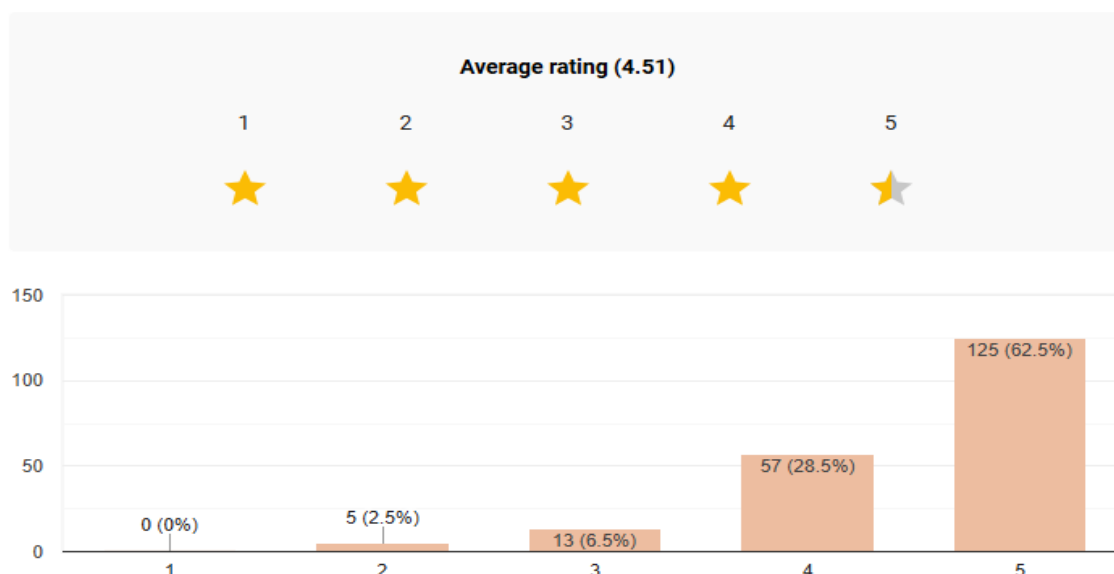


Fig – 7

Please share any feedback – positive or negative – about your experience with this assessment.

200 responses

This activity kept us engaged and we were able to revise those topic in such a short time.

It's was a Good initiative and good way of revision but it kept me quite occupied with my topic only. It was like a test sort of in many students mind so they were going over what what given to them instead of seeing the bigger picture. Although it did help with with segregating the topics and in what headlines we should study.

The Jigsaw method made revising the lungs and heart easy and interesting. Learning in groups helped me understand concepts better by discussing and teaching each other. It cleared doubts, improved teamwork, and made revision more interactive and effective compared to usual methods.

Very engaging

Good for student

Helpful

Nice help me out how i can improve my efficiency

Fig – 8

7. Student Engagement and Perception Survey

Student engagement and involvement were assessed using a Likert-scale questionnaire. The majority of students reported high levels of engagement, meaningful peer interaction, and improved understanding through the Jigsaw method.

8. Results

92.5% (185 students) agreed that the Jigsaw method helped them recall and apply anatomical knowledge more effectively.

92.0% (184 students) felt that it reinforced key concepts of heart and lung anatomy.

89.5% (179 students) reported sustained active engagement and meaningful expert-group discussions.

88.5% (177 students) expressed preference for incorporating more such activities in future learning.

91% (182 students) rated the method 4 or 5 on a five-point scale.

9. Discussion

The Jigsaw Method, originally conceptualized by Aronson and colleagues, is a structured cooperative learning strategy designed to promote interdependence, collaboration, and deeper understanding of academic content by assigning each learner a unique and essential role in the learning process.¹

Structured group interaction within cooperative learning environments has been shown to enhance student responsibility, collaboration, and conceptual clarity. Such approaches facilitate higher-order cognitive processes, including problem-solving and critical thinking, which are essential for lifelong learning among undergraduate students.^{2,3} Active learning strategies, in contrast to passive didactic teaching, consistently improve student engagement and learning outcomes.⁴

The theoretical foundation of the Jigsaw method lies in social interdependence and cooperative goal structures, which emphasize shared responsibility and collective success.⁵

In medical education, knowledge acquisition must be complemented by teamwork and communication skills to develop competent and effective healthcare professionals. Cooperative learning methods, including the Jigsaw technique, foster peer interaction, communication, and mutual accountability, thereby strengthening these essential professional competencies.^{3,5}

Consistent with previous research, the present study demonstrated improved student perceptions of content understanding, communication, and analytical skills following implementation of the Jigsaw Method. Similar findings have been reported in anatomy education, where peer-assisted learning through the Jigsaw approach resulted in higher engagement and better comprehension of complex topics.⁶

Student feedback in the current study revealed that the Jigsaw Method offered advantages over traditional tutorials by increasing opportunities for discussion, interaction, and learner involvement. These findings align with earlier studies conducted in medical education settings, which recommend integrating the Jigsaw Method into routine teaching to enhance understanding of clinically relevant topics.⁷

The Jigsaw classroom structure has also been shown to improve accountability and reduce social loafing among learners, particularly in large-group settings. By making each student responsible for teaching a portion of the content, the method enhances ownership of learning and group cohesion.⁸

Although active and dynamic learning strategies are often reported to yield maximum benefits in small-class environments, evidence suggests that such approaches remain effective even in larger cohorts. Large-scale studies on active learning in science and medical education have demonstrated significant improvements in student performance and engagement when compared to traditional lecture-based instruction.⁹

The adaptability of the Jigsaw Method further supports its use in undergraduate training programs. It has been successfully incorporated as structured classroom activities within science and medical curricula, allowing educators to embed student-centered learning even within conventional lecture formats.^{10, 11, 12}

In the context of Indian medical education, the National Medical Commission (formerly Medical Council of India) emphasizes learner-centered teaching, skill development, and communication competencies through Competency-Based Medical Education (CBME). Cooperative learning strategies such as the Jigsaw Method align closely with these educational reforms by addressing knowledge, skills, and attitudes simultaneously.¹⁴

Despite its effectiveness, certain limitations were noted in the present study. Time constraints restricted topic coverage to selected thoracic anatomy modules, and not all students had equal opportunities for formal presentation. Similar challenges have been acknowledged in previous cooperative learning studies, suggesting that optimal outcomes require adequate time allocation, trained faculty facilitation, and appropriate resource distribution.

Overall, the findings of the present study corroborate earlier evidence indicating improved retention, performance, and learner engagement with the Jigsaw Method compared to conventional didactic teaching. The method was particularly beneficial for slower learners, who demonstrated measurable improvement in comprehension and presentation skills, reinforcing the value of cooperative learning in diverse learner populations.^{1,5}

Limitations: Time constraints limited the breadth of content covered, as the intervention focused only on selected thoracic topics. Additionally, not all students had equal opportunities to present.

These limitations could be addressed in future studies by allocating more time, expanding topic coverage, and subdividing content further.

Overall, the findings align with previous reports indicating improved retention and performance with Jigsaw learning compared to conventional didactic teaching. Even slower learners demonstrated improvement in comprehension and presentation skills.

10. Conclusion

The present study concludes that the Jigsaw Method is an effective cooperative learning strategy not only for small-group teaching but also for large undergraduate medical classrooms. The method enhances academic achievement while simultaneously promoting communication skills, teamwork, social interaction, and respect for diverse perspectives—key attributes of competent medical professionals.

Key outcomes observed:

- Improved student confidence, communication, and teamwork skills
- Better conceptual understanding through peer explanation
- Active participation, including among slower learners
- A shift toward student-centered and interactive learning

11. Acknowledgements

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Disclosures: The authors declare no conflicts of interest.

12. Suggestions

The Jigsaw Method can be applied across multiple subjects in medical education.

Effective time management is crucial for successful implementation.

Active teacher facilitation significantly influences outcomes.

13. References

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