

Augmenting the Effectiveness of the Jigsaw Method in Medical Education by Overcoming Potential Challenges

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Abstract

Background: The jigsaw method is a teaching-learning approach to promote collaborative learning among medical students. In this method, students are encouraged to take responsibility for their education and contribute to the group's collective knowledge.

Objectives: The objectives of the article are to propose a step-wise plan for the implementation of the jigsaw method in medical education, identify challenges that could hinder successful implementation, and propose targeted solutions to overcome the difficulties identified.

Methods: This viewpoint was developed by searching published literature on the implementation of jigsaw methods in medical education. In addition, best practices and solutions were recommended to overcome the identified challenges.

Results: In addition to problem-solving and critical thinking skills, this method also helps in improving communication skills, teamwork, and leadership skills. The jigsaw method has been linked with a wide range of benefits for medical students, especially with regard to improving their comprehension, problem-solving abilities, and critical thinking. The success of the jigsaw method in the attainment of educational outcomes depends on identifying the potential challenges and measures employed to overcome them. All these identified challenges can be handled by training teachers to conduct such sessions, informing students well in advance, and promoting better group dynamics.

Conclusion: The Jigsaw method has been linked with a wide range of benefits for medical students. However, to optimise the benefits for medical students, there is an indispensable need to invest in training teachers and improving group dynamics.

Keywords: Jigsaw Method; Group Dynamics; Teaching; Learning; Problem-Solving; Teamwork; Medical Education

Background

The jigsaw method is a teaching-learning approach to promote collaborative learning among medical students, wherein, through group work, teachers foster active engagement, peer teaching, and critical thinking (1, 2). As students work together towards the attainment of shared learning goals, they interact with peers, exchange knowledge, apply knowledge in clinical practice for problem-solving, and subsequently even reflect on their experiences (1, 3, 4). In this method, students are encouraged to take responsibility for their

learning and contribute to the group's collective knowledge (1). Apart from problem-solving and critical thinking skills, this method is also helpful in improving communication skills, teamwork, and leadership skills, all of which are crucial to being a successful healthcare professional (1, 3, 5). The objectives of the article are to propose a step-wise plan for the implementation of the jigsaw method in medical education, identify challenges that could hinder successful implementation, and propose targeted solutions to overcome the difficulties identified.

Implementation of the jigsaw method

In this method, students are divided into small groups of 4-6 members each, with each member assigned a different part of the topic to study (6). This is followed by the creation of an expert group, wherein students assigned the same sub-topic come together, share their insights, clarify doubts, and enhance their understanding for a fixed period of time (6, 7). After this, students return to their original group, and each one of them teaches their sub-topic to the group so that everyone can completely understand the whole topic (6). The teacher monitors group dynamics throughout and ensures equal participation and intervenes to guide discussion or clarify confusion (6, 8). At the end of the activity, groups present their findings to the complete class, followed by discussions to reinforce key learning points (6, 7).

Teachers are also expected to provide feedback to students individually as well as in groups regarding their participation and performances (6). Further, even assessments can be carried out to measure the extent of learning, and measures should also be taken to ascertain the attainment of learning outcomes (6-8). In a quasi-experimental crossover study, the jigsaw method was employed to teach physiology to medical undergraduates in India (3). In another study done to facilitate cooperative learning, 53 participants were involved in the jigsaw method to teach abdominal anatomy in Australia (4). Further, the jigsaw method was employed in a randomized controlled trial done to assess the effectiveness in teaching principles of diagnostic reasoning, and it was concluded that the jigsaw method can promote collaborative learning and student engagement (8).

The jigsaw method encourages students to become experts in specific sub-topics and promotes active learning through student engagement and deep understanding via peer teaching (1). It also promotes teamwork and the development of interpersonal skills by creating a sense of shared ownership. In the process, it reduces unnecessary competition in classrooms by cultivating a supportive environment wherein students help each other succeed (1, 2). Finally, as students teach others, it reinforces their own knowledge, resulting in better long-term retention (1-3). However, we must not ignore the inherent limitations of this method, like the involvement of a small number of students, which restricts the prospects of generalizability of learning outcomes (5). Moreover, because these sessions are conducted for small durations, they do not provide insights into long-term effectiveness and sustained skill

development (2, 3). In addition, the success of the method precisely depends on individual preparation by students, and any lack of effort interferes with the learning acquisition among others (4, 5). Moreover, the process of assessment in a collaborative setting can be complex when compared to the evaluation of a single student (3).

Identified challenges and Potential solutions

Even though challenges in implementing the jigsaw method might appear separate, they are usually linked under the broader themes like the need for structured facilitation, student adaptability, and readiness of the institution (9, 10). For instance, unequal participation or poor group dynamics justify the importance of providing an inclusive learning environment. The findings obtained from a study that used peer rating and self-reported data from study participants concluded that successful cooperative learning depends on the willingness to work with their peers (9). Further, with the increase in use of blended learning, multiple digital tools (like Google Docs) can be used to stimulate group collaboration (2, 8). The success of the jigsaw method in the attainment of educational outcomes depends on identifying the potential challenges and measures employed to overcome them (Table 1).

One of the primary concerns is about the suitability of the method in all subjects or topics, and we must realize that not all topics can be divided into sub-topics (in other words, suitable for jigsaw learning) (7). This calls for the need for the curriculum committee and subject experts to meet and finalize those topics that are suitable for cooperative learning. From the students' perspective, the concerns include unequal participation (with a few students dominating while others contribute less to the discussion), and varying levels of preparedness, which can be either due to the quality of the students as a whole or their familiarity with the learning resource materials shared (4, 6). At the same time, this form of teaching can prove to be either time-consuming (if time limits for expert discussion and group discussion are not defined) or resource-intensive (if teachers fail to use the existing resource materials within the curriculum) (7, 8).

From the teachers' side, their competence levels in conducting and facilitating such sessions play a crucial role in the success of the method (6). The effectiveness of the session depends a lot on the group dynamics, as any conflict or lack of cooperation between group members can significantly impact the learning process (9, 11). On a similar note, if the students in the expert group fail to engage with the learning resources, it will result in a direct

impact on the quality of information that is subsequently shared with the original group (4, 7, 8).

This calls for the need to encourage students to engage actively, and there also lies the importance of the role of the teacher in addressing any potential concerns in the group (10). All these identified challenges can be handled by training teachers in conducting such sessions, informing students well in advance, and promoting better group dynamics, as detailed in Table 1 (4, 5, 7-11).

Conclusion

In conclusion, the jigsaw method has been linked with a wide range of benefits for medical students, especially with regard to improving their comprehension, problem-solving abilities, and critical thinking. However, to optimise the benefits for medical students, there is an indispensable need to invest in training teachers and improving group dynamic.

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References

1. Jeppu AK, Kumar KA, Sethi A. 'We work together as a group': implications of jigsaw cooperative learning. BMC Med Educ. 2023 Oct 6;23(1):734. doi: 10.1186/s12909-023-04734-y. [PMID: 37803418] [PMCID: PMC10559587]
2. Cochon Drouet O, Lentillon-Kaestner V, Margas N. Effects of the Jigsaw method on student educational outcomes: Systematic review and meta-analyses. Front Psychol. 2023 Aug 3;14:1216437.

- doi: 10.3389/fpsyg.2023.1216437. [PMID: 37599768] [PMCID: PMC10436097]
3. Wani P, Agarwal M, Joshi P. A comparative analysis of self-directed learning and the jigsaw method in medical physiology education. Cureus. 2025 May 28;17(5):e84986. doi: 10.7759/cureus.84986. [PMID: 40585730] [PMCID: PMC12203285]
4. Oakes DJ, Hegedus EM, Ollerenshaw SL, Drury H, Ritchie HE. Using the jigsaw method to teach abdominal anatomy. Anat Sci Educ. 2019 May;12(3):272-283. doi: 10.1002/ase.1802. [PMID: 30179312]
5. Kaur M, Mahajan R. Inculcating critical thinking skills in medical students: Ways and means. Int J Appl Basic Med Res. 2023 Apr-Jun;13(2):57-58. doi: 10.4103/ijabmr.ijabmr_214_23. [PMID: 37614845] [PMCID: PMC10443455]
6. Chopra D, Kwatra G, Bhandari B, Sidhu JK, Rai J, Tripathi CD. Jigsaw classroom: Perceptions of students and teachers. Med Sci Educ. 2023;33(4):853-859. doi: 10.1007/s40670-023-01805-z. [PMID: 37546208] [PMCID: PMC10403414]
7. Goolsarran N, Hamo CE, Lu WH. Using the jigsaw technique to teach patient safety. Med Educ Online. 2020 Dec;25(1):1710325. doi: 10.1080/10872981.2019.1710325. [PMID: 31884898] [PMCID: PMC6968255]
8. Ozkan S, Uslusoy EC. Outcomes of jigsaw technique in nurse education: A systematic review and meta-analysis. Nurse Educ Pract. 2024 Feb;75:103902. doi: 10.1016/j.nepr.2024.103902. [PMID: 38301377]
9. Premo J, Wyatt BN, Horn M, Wilson-Ashworth H. Which group dynamics matter: Social predictors of student achievement in team-based undergraduate science classrooms. CBE Life Sci Educ. 2022 Sep;21(3):ar51. doi: 10.1187/cbe.21-06-0164. [PMID: 35900893] [PMCID: PMC9582812]
10. Kassab SE, Taylor D, Hamdy H. Student engagement in health professions education: AMEE Guide No. 152. Med Teach. 2023 Sep;45(9):949-965. doi: 10.1080/0142159X.2022.2137018. [PMID: 36306374]
11. Launer J. Collaborative learning groups. Postgrad Med J. 2015 Aug;91(1078):473-4. doi: 10.1136/postgradmedj-2015-133611. [PMID: 26304987]

Table 1. Identified challenges and potential solutions

Identified challenges	Potential solutions
Unequal participation	The roles assigned to each member of the group should be changed in every jigsaw session.
	Explain to all students what is expected of them and that every member must participate.
	Teachers can monitor the discussion and subsequently provide feedback to students for both individual and group participation.
	Introduce peer assessments to hold each student accountable for their involvement.
Time consuming	Share learning resources in advance to expedite the process
	Pre-define time limits for each phase of the process (viz., expert group discussions, group teaching, etc.)
	Use technology (like Google Docs for collaborative working) to expedite the discussion.
Difficulties in assessment	Employ individual assessments (like a quiz) to measure the extent of understanding.
	Formulate rubrics to measure both individual contributions and overall group performance.
	A combination of peer and self-assessment will be used to make the assessment process comprehensive.
Varying levels of student preparedness	Share learning resources in advance to ensure everyone has a basic understanding.
	Create groups with students of different abilities so that stronger students can help less-prepared ones.
	Teachers can monitor discussions and extend support to students who struggle with the learning resources.

Poor group dynamics	Start with team-building activities to improve bonding before the jigsaw session.
	Designate roles like "mediator" or "timekeeper" to manage group dynamics effectively.
	Teachers can observe group interactions and intervene early to resolve any conflicts.
Poor effectiveness of the expert group	Share structured templates for expert groups to ensure deep engagement with the material.
	Teachers can monitor and guide students to ensure key aspects are covered
Concerns with facilitator role	Organise training sessions to empower teachers to conduct jigsaw sessions effectively.
	Frame rubrics to help teachers assess group dynamics and performance
Resource intensive	Encourage use of digital resources (viz., online articles, videos) to reduce the need for physical materials.
	Incorporate content from textbooks or already available curriculum resources to save time and effort.
Relevance in all subjects	Curriculum committee and Subject experts should carefully select the topics that require collaborative learning.
	Combine jigsaw with other learning techniques, like problem-based learning, when topics are too complex for simple division.