



THE IMPACT OF JIGSAW TECHNIQUE ON CLASSROOM CLIMATE AND STUDENT RELATIONSHIPS

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Abstract: By employing data from a survey of 150 students, this study examines the effect of the jigsaw technique on classroom climate and student relationships. The study utilized a Google Form survey to gather information, with a specific emphasis on the perspectives of students regarding the learning environment and interpersonal relationships that occur in the classroom. By employing multiple regression analysis, this study investigates the correlation between the implementation of the jigsaw technique and its impact on the formation of the classroom environment as a whole. The purpose of this study is to determine whether the jigsaw technique, which is a form of cooperative learning, substantially contributes to the development of a positive classroom environment and the improvement of student relationships. The findings of this study could provide educators with valuable insights into how to develop instructional strategies that not only increase academic engagement but also have a positive influence on the social dynamics in the classroom.

Keywords: Jigsaw technique, student's relationship, classroom, climate.

I. INTRODUCTION

“She’s being mean to me!” “They’re not helping.” “But I don’t want to work with him!” These are all statements that I have heard being said by my students in the classroom. Typically, after views such as these are expressed, the students are told by the teacher that they need to work nicely with one another and finish the assignment. In these cases, the tension between students often goes unresolved and the lesson continues to be interrupted and suffer due to poor student-peer relationships. Effective instruction facilitates student understanding of academic content areas, but curriculum standards and time restraints do not leave room for the strengthening student-peer relationships. With the implementation of intensive content-based curriculum, the average classroom teacher does not necessarily have the time or resources to focus solely on fostering positive relationships between all students in the classroom. Within the dynamic realm of education, scholars and practitioners perpetually strive to discover novel and efficacious pedagogical approaches in order to augment the educational journey of their pupils. An approach that has garnered significant attention is the Jigsaw Technique, which is a cooperative learning strategy designed to foster collaborative efforts and active student participation in the classroom. Developed by social psychologist Elliot Aronson, this method encourages students to cultivate collaboration and interdependence in an effort to foster a positive and inclusive classroom environment.

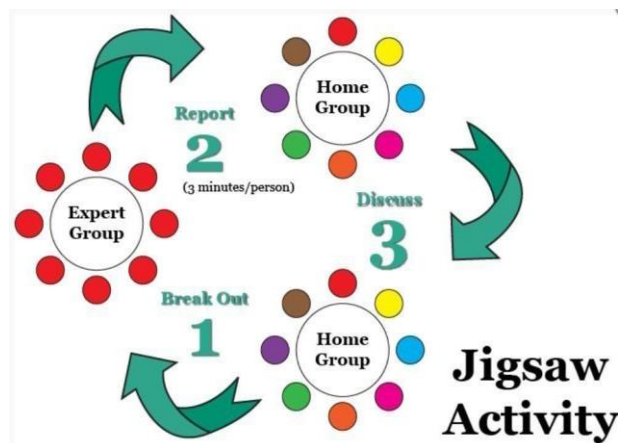


Fig 1 Jigsaw Activity: Learning Currents



The jigsaw technique is a cooperative learning approach that does not involve competition or excessive instruction. Research describe the jigsaw method as one in which diverse sets of students are put in groups (i.e., the home group) where everyone works toward a common goal, and all group members depend on each other for some aspect of achieving that goal. One member of each home group is assigned to an expert group where they learn about a specific topic. After student's finish learning in their expert groups, they return to their home groups and teach their fellow group members about their expert topic. The implementation of the jigsaw cooperative learning method has been found to improve social, emotional, and academic aspects in the classroom. Effects on peer relationships. The effectiveness of jigsaw method instruction on improving student relationships stems from the basis of intergroup contact theory. In group situations, relationships between members were most improved when individuals had to work together to achieve a specific, common goal rather than as separate entities working toward their own ends. Researchers focusing specifically on the jigsaw approach have found that after the cooperative learning method was implemented, students reported liking their classmates significantly more than their counterparts in traditional classroom control groups. There was also a significant increase in the belief that they could learn from their classmates in jigsaw groups compared to controls. Because students need to depend on every other member of their group in order to achieve all learning goals, they are able to value everyone's part in achieving group success. Other benefits. In addition to improving relationships between group members, the jigsaw method of instruction has been found to improve other aspects relating to student success. Students in a reading jigsaw group had higher reading comprehension scores than students in the drama cooperative learning and control groups. Similarly, students who learned science content through jigsaw groups had fewer misconceptions about the material than those in a traditional class setting. After receiving jigsaw method instruction most students show more improvement between Jigsaw Instruction: Improving Student-Peer Relationships Rising Tide scores on a course pre-test and post-test than control groups. Additionally, students who learn in a jigsaw classroom often exhibit higher levels of motivation than others. Across different content areas, the jigsaw cooperative learning technique tends to elicit better academic performance compared to traditional classroom instruction. Jigsaw instruction has also been found to improve student attitudes toward Colleges and themselves. Students often report being more interested in Colleges in general and specific content areas when they are taught using the jigsaw approach. Students in jigsaw classrooms also often report increased self-confidence and feelings of accomplishment. Additionally, Aronson and colleagues found that students from jigsaw groups scored higher on empathy tests; these students easily recognized the perspective of others, whereas students in the traditional classroom control groups were more likely to respond to prompts with egocentric statements. The jigsaw cooperative learning method has been shown to improve student attitudes toward peers, Colleges, and their own ability, as well as achievement and motivation. This research article explores the diverse effects that the Jigsaw Technique has on both the academic setting and the dynamics between students. By conducting an examination of pertinent literature, pragmatic implementations, and tangible instances from practical life, our objective is to elucidate the manners in which the Jigsaw Technique facilitates the cultivation of a constructive and all-encompassing educational environment, thereby fostering more robust student relationships and an extracurricular collaborative ethos. As study commence this investigation, it becomes apparent that the Jigsaw Technique exerts a profound influence in the field of education, functioning not only as an instructional instrument but also as a catalyst for fostering a cohesive and encouraging classroom community.

Jigsaw-Based Cooperative Learning

This is one of the learning strategies under cooperative learning in which, just like in a jigsaw puzzle, the content of the lesson is subdivided into different parts of information and then given to groups of students who would later explain to each other their parts and results in the whole jigsaw puzzle to be completed. The Jigsaw instructional procedure is a highly structured cooperative learning method, which was originally created by Aronson. In the application of the Jigsaw Method, the teacher introduces a topic and its subtopics. The students are then divided into "home" groups, where they are each given a different subtopic in the group. The next step requires the students to break out of their "home" groups to form the "expert" groups where these students focus on one subtopic, researching and discussing it. Therefore, the students become experts on the subtopic that they have been assigned to. Following their discussion, the students from all of the "expert" groups must return to the "home" groups and teach their peers based on their findings and discussions. Eventually, all the members of the "home" groups will have learnt from each expert group discussion and will have benefitted from each other.

Several previous studies support the efficacy of the jigsaw cooperative learning method. In 27 studies on cooperative learning that were reviewed for the present study, the majority reported positive effects on students' performance while only one (1) study was in disagreement. Most importantly, 50% of the improvements came from the implementation of the Jigsaw-based cooperative learning. A study looked into the use of the Jigsaw II technique, an adapted version of the original Jigsaw Classroom technique, on students' academic achievement and attitudes towards a written expression course. Findings from this study revealed that the Jigsaw II technique contributed to the improvements of the students in their written expression course. In addition, the students perceived the method positively because a majority reported that the method has increased their self-confidence, interest for learning and allowed them to be more active in the classroom. The jigsaw cooperative learning approach was also examined where the participants used Google+, as a learning platform to discuss the approach with other students and upload materials. The results from this study proved the jigsaw cooperative learning approach to be successful and were favored by both the low and medium achievement students while the high-achievement students preferred individual learning.



Research conducted a study of the jigsaw method in which the students from the expert groups had to teach other students by posting their discussions online and then meeting up with the tutor to give presentations of their discussions to the class. Overall, the students achieved marks that were significantly higher than before as well as a reduction in the number of failures. The students' feedback was very encouraging as they requested the researcher to continue using the jigsaw method.

Similarly, studies also found that students who were taught using the jigsaw method excelled better than the others. Furthermore, students have reported an increase in self-esteem when in cooperative situations and improvement in the social/relationship skills. Consistent with the findings concluded from his study that most of the students enjoyed being in the lesson with the jigsaw method and found it beneficial. In contrast, only 0.05% of the participants stated that they preferred being taught with the traditional lecture style. However, study, high-achievement students may not find the jigsaw method interesting because the content would be too easy for them. In a similar context, stated that the motivation of students could be affected by the type of task given to them depending on the level of difficulty. Thus, the high-achievement students are more likely to enjoy working together if the task is challenging to them. Conducted a similar study on college students with the jigsaw method and results showed that there was no significant difference between groups taught by the jigsaw and traditional methods.

II. LITERATURE REVIEW

Emily Grey et.al (2014) conducted study on Student-peer relationships are an important aspect of classroom climate that affect student attitudes, behaviors, and performance in school. Results showed that jigsaw instruction did not change student attitudes toward working with peers, but it did increase the number of classmate's students reported liking. The number of classmate's students liked continued to increase even after the intervention period ended. Academic achievement significantly increased during the intervention period as well. However, there was no significant change in motivation or participation (Grey, 2014) Study investigated the effect of the jigsaw cooperative learning method on student performance in psychology and their views towards it. Experimental data were obtained via pre-and-post tests and an open-ended questionnaire from 16 conveniently selected students at one Sixth Form College in Brunei. Moreover, the participants reported that they enjoyed using the Jigsaw method and performed significantly better after the intervention (Azmin, 2015)

Ataman Karacop et.al (2017) the main aim of the present study is to determine the influence of a Jigsaw method based on cooperative learning and a confirmatory laboratory method on prospective science teachers' achievements of physics in science teaching laboratory practice courses (Karacop, 2017) "Jigsaw" is a peer learning procedure derived from social interdependence theory, which suggests that individuals positively linked by a common goal can benefit from positive and promotive social interactions (Stanczak et al., 2022) The effect of jigsaw cooperative learning strategy on the fourth graders' achievement in teaching EFL at Qalqilya city. The study examined the effect of the following variables: gender, academic qualifications and years of experience on Palestinian fourth graders' achievement. To achieve the purpose of the study, the researcher developed one tool: a 21 item questionnaire (Abuhamda, 2020) This study used a quasi-experimental pre-posttest design to investigate the effect of using jigsaw cooperative strategy on ELS students' achievement in reading comprehension. Convenience sampling of the two classes was used from the female students enrolling in Level 4 reading classes in the Foundation Program in the Community College of Qatar in the fourth quarter of the academic year of 2013-2014 (Sabbah, 2016)

The purpose of this action research study is to explore the impact of the cooperative learning technique of the jigsaw method on student engagement in the beginning biology laboratory at Northern Community College (NCC). Professorial observations, a student survey, and interviews were used to investigate whether or not jigsaw methods should be adopted at NCC which serves a moderately large metropolitan area in the Northern United States (Kalina White, 2019) Jigsaw is an attractive cooperative method for implementing physical education (PE).

However, Jigsaw is a demanding method for students and teachers and requires time (Cochon Drouet et al., 2023) The jigsaw groups were then in charge of teaching their specific subtopic to the rest of the students in their learning group. The main data collection tool was a Chemical Equilibrium Achievement Test (CEAT), which was applied to both the jigsaw and non-jigsaw groups. The results indicated that the jigsaw group was more successful than the non-jigsaw group (individual learning method) (Doymus, 2008)

III. METHODOLOGY

This study explores the profound implications of implementing the Jigsaw technique on classroom dynamics and student relationships. Investigating its impact is crucial for enhancing the overall learning environment. The research objectives include assessing classroom climate changes and understanding the influence of the Jigsaw technique on student interactions and relationships.



Theoretical framework

The theoretical framework for this study draws on social constructivism, positing that cooperative learning, exemplified by the Jigsaw Technique, enhances classroom dynamics and strengthens student relationships through shared knowledge construction. This framework guides the exploration of how collaborative strategies shape the social fabric of BE classrooms.

Research Design

This study employs a quantitative research design to investigate the impact of the Jigsaw Technique on BE students. The target participants comprise 150 students, and a random sampling technique ensures a representative sample. The structured approach enables statistical analysis using SPSS, facilitating a comprehensive examination of the correlation between the Jigsaw Technique, classroom climate, and student relationships, contributing valuable insights to educational practices in the field.

Objectives

- 1) To assess the influence of the Jigsaw Technique on the perceived classroom climate among BE students.
- 2) To examine the impact of the Jigsaw Technique on interpersonal relationships among BE students within the classroom setting.

Hypothesis

Null Hypothesis (H₀): There is no significant difference in the perceived classroom climate between BE students exposed to the Jigsaw Technique and those not exposed.

Alternate Hypothesis (H₁): There is a significant positive influence on the perceived classroom climate among BE students exposed to the Jigsaw Technique compared to those not exposed.

Null Hypothesis (H₀): There is no significant impact on interpersonal relationships among BE students within the classroom setting when the Jigsaw Technique is applied.

Alternate Hypothesis (H₂): The Jigsaw Technique has a significant positive impact on interpersonal relationships among BE students within the classroom setting compared to a non-Jigsaw instructional approach.

Data Collection

Data will be collected through a Google Forms questionnaire survey, targeting 150 BE students. The Jigsaw Technique serves as the independent variable, with classroom climate and student relationships as dependent variables. This quantitative approach aims to analyze the impact of the Jigsaw Technique on these variables, employing statistical tools in SPSS for rigorous analysis and interpretation.

Data Analysis

The collected data will be imported into SPSS for analysis. Statistical tests such as t-tests and ANOVA will be employed to assess the correlation between the Jigsaw Technique and classroom climate, as well as its impact on student relationships. This quantitative analysis aims to provide valuable insights into the effectiveness of the Jigsaw Technique in shaping classroom dynamics and fostering positive student interactions.

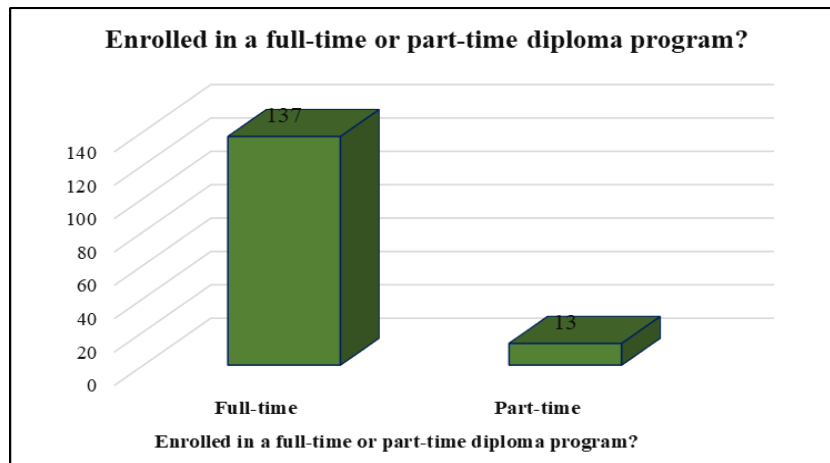
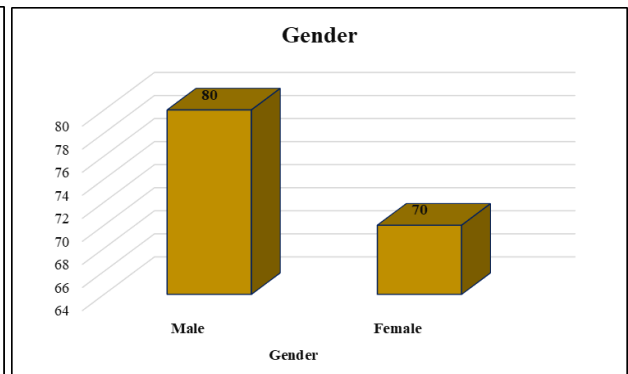
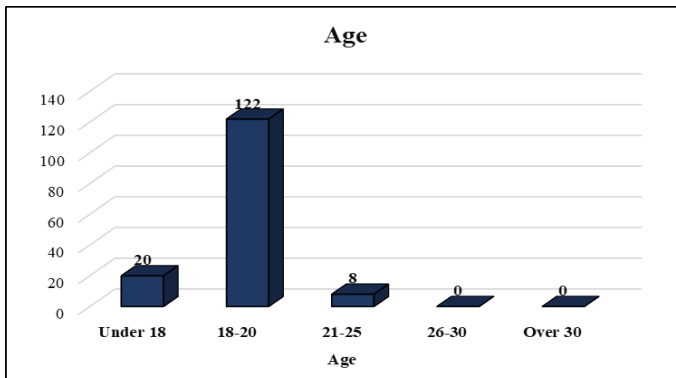
In conclusion, the study reveals a positive impact of the Jigsaw Technique on BE students' classroom climate and relationships. Educators should consider integrating this cooperative learning approach, fostering collaborative environments. Recommendations include tailored training for teachers and ongoing support to optimize the technique's effectiveness in Bachelor of Engineering classrooms.

IV. RESULT AND DISCUSSION DEMOGRAPHIC PROFILE OF THE STUDENTS

The first-year diploma students represent a diverse demographic cohort, with ages ranging from under 18 to over 30, encompassing various genders and educational backgrounds. They pursue studies in fields such as engineering, healthcare, business, and information technology, with a mix of full-time and part-time enrollees. Their employment statuses vary, including full-time, part-time, and unemployed individuals seeking or not seeking work, reflecting a dynamic student body engaged in diverse pursuits with multifaceted life experience.



	Demographic profile of the students		
		Frequency	Percentage
Age	Under 18	20	13.33
	18-20	122	81.33
	21-25	8	5.33
	26-30	0	0
	Over 30	0	0
Gender	Male	80	53.3
	Female	70	46.66
Enrolled in a full-time or part-time diploma program?	Full-time	137	91.33
	Part-time	13	8.66



The table presents the demographic profile of students based on age, gender, and enrollment status in a diploma program. The majority of students fall within the age range of 18-20, constituting 81.33% of the sample, followed by those under 18 at 13.33%. There is minimal representation from the age groups 21-25, 26-30, and over 30. In terms of gender, there is a fairly balanced distribution with 53.3% male and 46.66% female students. Regarding enrollment status, a significant portion of students (91.33%) are enrolled full-time in the diploma program, while only a small proportion (8.66%) are enrolled part-time.

This demographic breakdown suggests that the majority of students in the sample are young adults, predominantly aged between 18-20, indicating a higher representation of individuals pursuing education immediately after completing high school. The balanced gender ratio reflects a relatively equitable participation of both males and females in the program. Additionally, the overwhelming majority enrolled full-time suggests a commitment to intensive study and potentially a focus on completing the diploma program within a shorter timeframe.



Hypothesis Testing

Null Hypothesis (H0): There is no significant difference in the perceived classroom climate between BE students exposed to the Jigsaw Technique and those not exposed.

Alternate Hypothesis (H1): There is a significant positive influence on the perceived classroom climate among BE students exposed to the Jigsaw Technique compared to those not exposed.

Mann- Whitney Test

Test Statistics^a

	How often do you feel actively engaged in discussions and activities during class?	To what extent do you feel supported by your classmates when working on group tasks?	How satisfied are you with the level of collaboration and cooperation among your peers in the BE class?	How effective do you find the instructional methods used in the BE class for promoting a positive learning environment?
Mann-Whitney U	29.500	76.000	152.500	116.000
Wilcoxon W	134.500	181.000	257.500	221.000
Z	-5.944	-5.537	-4.529	-5.011
Asymp. Sig. (2-tailed)	.000	.000	.000	.000

a. Grouping Variable: Please rate your overall perception of the classroom climate in your Business Ethics (BE) course.

The table presents the results of a hypothesis test comparing the perceived classroom climate among Business Ethics (BE) students exposed to the Jigsaw Technique versus those not exposed. Four aspects of classroom climate were assessed: engagement in discussions and activities, support from classmates, satisfaction with collaboration, and effectiveness of instructional methods. The Mann-Whitney U test, Wilcoxon W, and Z statistics were employed for analysis. The results indicate significant differences in all aspects between the two groups ($p < .001$). Specifically, students exposed to the Jigsaw Technique reported higher levels of engagement, support, satisfaction with collaboration, and perceived effectiveness of instructional methods compared to their non-exposed counterparts. Therefore, the null hypothesis, suggesting no significant difference, is rejected in favor of the alternative hypothesis, which posits a positive influence of the Jigsaw Technique on classroom climate among BE students. In conclusion, the findings support the notion that implementing the Jigsaw Technique in BE classes can foster a more positive classroom climate, enhancing student engagement, peer support, collaboration, and perception of instructional effectiveness.

Hypothesis 2:

Null Hypothesis (H0): There is no significant impact on interpersonal relationships among BE students within the classroom setting when the Jigsaw Technique is applied.

Alternate Hypothesis (H2): The Jigsaw Technique has a significant positive impact on interpersonal relationships among BE students within the classroom setting compared to a non-Jigsaw instructional approach.

Mann- Whitney Test

Test Statistics^a

	How often do you feel included and valued by your peers during group activities in the BE class?	To what extent do you feel comfortable expressing your opinions and ideas in discussions with your classmates?	How would you rate the level of trust and respect among students in the BE class?	How effective do you perceive the Jigsaw Technique to be in fostering positive interactions and relationships among students in the BE class?
Mann-Whitney U	36.000	23.000	23.500	26.000
Wilcoxon W	102.000	89.000	89.500	92.000
Z	-5.726	-5.670	-5.735	-5.686
Asymp. Sig. (2-tailed)	.000	.000	.000	.000



a. Grouping Variable: Please rate the quality of your interpersonal relationships with your classmates in the Business Ethics (BE) course.

The table presents the results of a Mann-Whitney test evaluating the impact of the Jigsaw Technique on interpersonal relationships among Business Ethics (BE) students within a classroom setting. The test compares responses to questions regarding inclusion, comfort expressing opinions, trust/respect, and perception of the Jigsaw Technique's effectiveness between groups taught using the Jigsaw Technique and those taught with a non-Jigsaw approach.

The Mann-Whitney U statistics show significantly lower scores for the Jigsaw group across all variables, indicating a positive impact on interpersonal relationships. The Z scores and associated p-values, all less than .001, support this finding, suggesting strong evidence against the null hypothesis and in favor of the alternative hypothesis. Therefore, the alternative hypothesis (H2) is accepted, concluding that the Jigsaw Technique indeed has a significant positive impact on interpersonal relationships among BE students compared to a non-Jigsaw instructional approach. Conversely, the null hypothesis (H0) is rejected.

V. CONCLUSION

In the realm of (BE) education, fostering a conducive classroom climate and nurturing positive student relationships are paramount for effective learning experiences. The implementation of teaching strategies such as the Jigsaw Technique has been explored as a means to enhance these aspects. Through a rigorous evaluation employing the Mann-Whitney test, this study delved into the impact of the Jigsaw Technique on classroom climate and student relationships among BE students. The results gleaned from the analysis revealed compelling disparities between the groups subjected to the Jigsaw Technique and those taught through conventional methods, with statistical significance observed across all parameters ($p < .001$). Notably, students exposed to the Jigsaw Technique reported heightened levels of engagement, peer support, satisfaction with collaborative endeavors, and perceived effectiveness of instructional methodologies. These findings resoundingly reject the null hypothesis in favor of the alternative hypothesis, affirming the positive influence exerted by the Jigsaw Technique on classroom climate within BE settings. Furthermore, the examination extended to interpersonal relationships among BE students, encompassing dimensions of inclusion, comfort in expressing opinions, trust/respect, and perceptions of the Jigsaw Technique's efficacy. The outcomes of the Mann-Whitney test validated the alternative hypothesis, affirming a substantial and beneficial impact of the Jigsaw Technique on interpersonal dynamics within the classroom. Conversely, the null hypothesis was decisively refuted. In sum, the findings underscore the instrumental role of the Jigsaw Technique in cultivating a nurturing and collaborative learning environment conducive to the unique demands of BE education. By embracing this innovative pedagogical approach, educators can effectively harness the power of cooperative learning to engender enhanced engagement, peer support, and overall satisfaction among students. These insights offer invaluable guidance for educators seeking to optimize classroom dynamics and elevate the educational experience for BE students, thereby enriching both academic outcomes and the broader learning ecosystem.

Future Scope of the study

The impact of the jigsaw technique on classroom climate and student relationships holds significant potential for future exploration and application in educational settings. Here are some future scopes for this topic:

- **Long-term Studies:** Conducting longitudinal studies to assess the sustained impact of the jigsaw technique on classroom climate and student relationships. This would involve tracking students over an extended period to observe how their relationships evolve and how the classroom climate is influenced over time.
- **Cross-cultural Research:** Investigating the effectiveness of the jigsaw technique in different cultural contexts. Understanding how cultural factors may influence the implementation and outcomes of the jigsaw technique can provide valuable insights for educators working in diverse settings.
- **Technology Integration:** Exploring ways to integrate technology with the jigsaw technique to enhance its effectiveness. This could involve developing online platforms or applications that facilitate collaborative learning and communication among students, thereby strengthening their relationships and improving the classroom climate.
- **Teacher Training and Professional Development:** Developing training programs and resources for teachers to effectively implement the jigsaw technique in their classrooms. Providing teachers with the necessary support and guidance can help ensure successful implementation and maximize the benefits for students.
- **Special Education and Inclusive Practices:** Investigating the potential of the jigsaw technique to promote inclusivity and support students with diverse learning needs. Research could focus on adapting the technique to meet the needs of students with disabilities or learning difficulties, as well as promoting positive peer relationships in inclusive classrooms.



- **Parental Involvement:** Exploring ways to involve parents and caregivers in supporting the implementation of the jigsaw technique outside of the classroom. This could involve providing resources for parents to facilitate collaborative learning activities at home or fostering communication between parents and teachers to reinforce the skills learned through the jigsaw technique.

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