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RESEARCH ARTICLE

A Comparative Study on the Effectiveness of Think-Pair-Share and Jigsaw Techniques in Enhancing Collaborative Learning among Pre-Service Teachers in North Gujarat (India)

Asha Rani Anto*

Abstract

This study evaluates the comparative effectiveness of two collaborative learning techniques—Think-Pair-Share (TPS) and Jigsaw—in enhancing engagement, critical thinking, and collaborative skills among pre-service teachers in North Gujarat. A quasi-experimental research design was used, involving 353 pre-service teachers across four teacher training colleges. Participants were divided into two groups exposed to either TPS or Jigsaw over six weeks. Data collection tools included pre- and post-intervention surveys, performance assessments, reflective journals, and focus group discussions. Quantitative analysis revealed statistically significant improvements in both groups ($p < .05$), with the TPS group showing a 25% gain in collaborative skills and the Jigsaw group achieving a 30% gain. Qualitative data revealed that TPS enhanced peer interaction and clarity of thought, while Jigsaw fostered interdependence and deeper conceptual understanding. This study contributes to teacher education by providing evidence on the effectiveness of collaborative pedagogies and highlights the need for integrating context-appropriate active learning methods into pre-service teacher training programs.

Keywords: Think-Pair-Share, Jigsaw, collaborative learning, pre-service teachers, teacher training, North Gujarat, active learning

Introduction

In the realm of teacher education, the imperative to enhance pedagogical practices is ever-present, as educators strive to cultivate environments conducive to collaborative learning. A significant focus within this domain is the exploration of innovative teaching techniques that not only engage pre-service teachers but also prepare them for the complexities of contemporary classrooms. Among the myriad strategies available, two prominent collaborative pedagogical techniques—Think-Pair-Share and Jigsaw—have garnered attention for their potential to foster active engagement and deeper understanding among learners.

Think-Pair-Share, a widely used instructional strategy, encourages students to think individually about a posed question, pair up with a peer to discuss their thoughts, and subsequently share their insights with the larger group. This method promotes critical thinking and communication skills, essential competencies for future educators. Conversely, the Jigsaw technique involves dividing a topic into segments, with each student responsible for mastering a specific piece before teaching it to their peers. This method not only facilitates individual accountability but also nurtures a sense of community and collaborative learning, as students rely on one another to achieve a comprehensive understanding of the subject matter. This comparative analysis aims to examine the impact of these two techniques within pre-service teacher training programmes, assessing their effectiveness in fostering collaborative skills and enhancing pedagogical knowledge. By investigating the outcomes associated with each method,

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this study seeks to contribute to the ongoing discourse surrounding best practices in teacher education, ultimately informing the development of more effective and inclusive training programmes. Fostering collaborative pedagogy is essential in pre-service teacher training, as it equips future educators with the skills necessary for effective classroom engagement. This study examines the comparative impact of two widely used collaborative techniques: Think-Pair-Share and Jigsaw. Think-Pair-Share encourages individual reflection followed by paired discussion, promoting active participation and critical thinking. In contrast, the Jigsaw technique fosters interdependence by assigning different segments of material to small groups, requiring collective effort to achieve a comprehensive understanding. Preliminary findings suggest that while both methods enhance collaborative skills, Jigsaw may lead to deeper engagement and retention of content due to its structured interactivity. Ultimately, integrating these techniques into teacher training programmes can cultivate a collaborative ethos, preparing pre-service teachers to foster similar environments in their future classrooms.

Theoretical Framework

Transformational Leadership Theory

Originally proposed by Burns (1978) and later expanded by Bass (1985), transformational leadership theory emphasizes the role of leaders in inspiring and motivating others to exceed expectations and embrace change. In the context of education, teacher educators act as instructional leaders who influence pre-service teachers not only through content delivery but also by modeling collaborative, reflective, and student-centered pedagogies (Leithwood & Jantzi, 2000). Think-Pair-Share and Jigsaw techniques reflect transformational leadership qualities by fostering trust, intellectual stimulation, and individualized support among learners. By encouraging collaborative inquiry and shared responsibility, these methods promote a leadership-oriented approach to classroom engagement, where learners become co-creators of knowledge.

Social Constructivism

Rooted in the works of Vygotsky (1978), social constructivism asserts that learning is inherently a social process. Knowledge is constructed through interaction, dialogue, and negotiation within a cultural and social context. Both Think-Pair-Share and Jigsaw operationalize this principle by requiring learners to engage in peer interaction, knowledge-sharing, and meaning-making. These collaborative strategies facilitate the Zone of Proximal Development (ZPD), where learners scaffold each other's understanding through structured

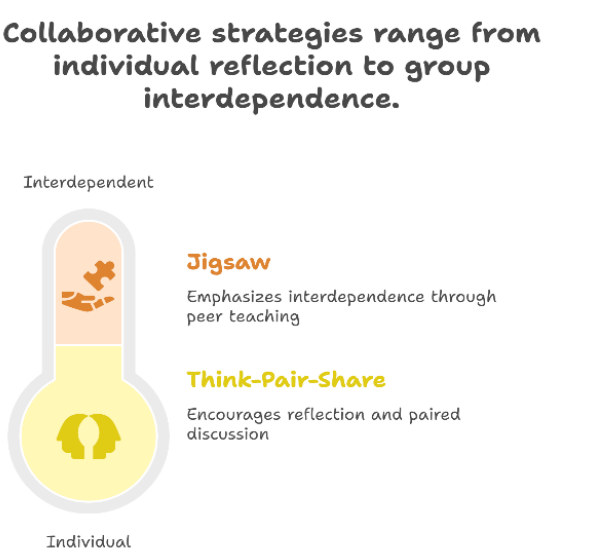


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group processes. This framework supports the study's assumption that collaborative learning not only enhances comprehension but also builds essential pedagogical competencies among pre-service teachers. Together, these theories offer a robust conceptual foundation for examining how structured collaboration influences the development of teaching skills and professional identity in pre-service teacher education.

Literature Review

Collaborative strategies like TPS and Jigsaw have long supported critical thinking and engagement (Gokhale, 1995; Topping, 2005). TPS encourages reflection, paired discussion, and group sharing (Lyman, 1981; Kagan, 1994). Jigsaw, developed by Aronson et al. (1978), emphasizes interdependence as students teach peer-assigned segments. Research supports their utility in boosting motivation, academic performance, and cooperative learning outcomes (Johnson & Johnson, 1989; Slavin, 1995).

Method

This study involved 353 pre-service teacher trainees from four teacher-training institutions in North Gujarat: DD Choksi Secondary College, Swami Vivekanand College of Teacher Training, R.H. Patel B.Ed College, and JG College of Education. The sample included 142 males (40.2%) and 211 females (59.8%), with ages ranging from 20 to 32 years (M = 24.5, SD = 2.6). Participants represented diverse specializations, including primary (34.8%), secondary (52.1%), and special education (13.1%).

Research Design

A quasi-experimental, between-groups design was used to

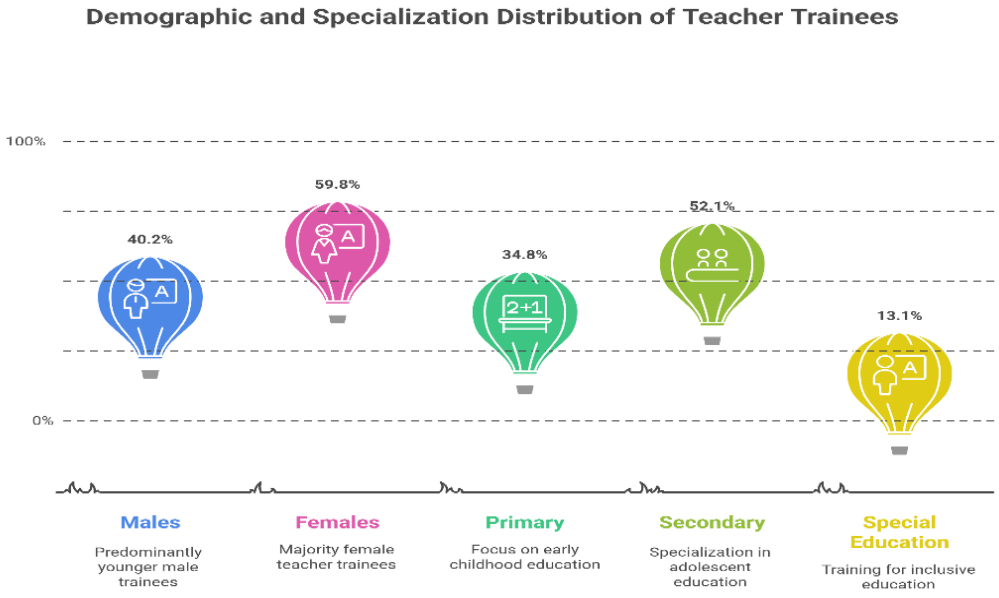


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compare the effects of Think-Pair-Share (TPS) and Jigsaw techniques. Participants were randomly assigned to two groups: TPS (n = 175) and Jigsaw (n = 178).

Instruments

Data were collected using

- Collaborative Skills Assessment Tool (CSAT) – 10-item self-report scale, Cronbach's alpha = .88
- Reflective journals
- Observation checklists completed by faculty observers

Procedures

Over six weeks, both groups received structured collaborative instruction. TPS sessions followed a standard think-discuss-share cycle, while Jigsaw sessions involved expert group preparation and peer teaching.

Results

Descriptive Statistics

Table 1 Descriptive Statistics for Collaborative Skills Assessment Tool (CSAT)

Table 1: presents the pre- and post-test CSAT scores

Group	*N*	*Pre-Test M (SD)*	*Post-Test M (SD)*	*Mean Gain*
TPS	175	58.7 (8.5)	73.4 (7.9)	14.7
Jigsaw	178	59.2 (9.1)	76.8 (7.1)	17.6

Table 2: Sample items from the collaborative skills assessment tool (csat) and Descriptive Statistics (N = 353)

Item No.	*Statement*	*M*	*SD*
1	I actively contribute to group tasks and discussions.	4.3	0.6
2	I listen attentively to my peers during group activities.	4.5	0.5
3	I respect different viewpoints within the group.	4.2	0.7
4	I share responsibilities fairly with team members.	4.1	0.8
5	I provide constructive feedback to my peers.	4.0	0.7
6	I can resolve conflicts calmly and respectfully.	3.9	0.9
7	I encourage participation from all group members.	4.4	0.6
8	I communicate my ideas clearly during collaboration.	4.2	0.6
9	I adapt to group decisions even if they differ from my personal views.	3.8	0.9
10	I take initiative when the group needs direction or support.	4.1	0.7

Table Note: Responses were measured on a 5-point Likert scale: 1 = *Strongly Disagree*, 5 = *Strongly Agree*. Total scale reliability: Cronbach's α = .88.

Table 3: Sample Faculty Observation Checklist (for TPS or Jigsaw Session)

Observation Criteria	*Rating Scale*	*Notes*
Clear instructions and task distribution	Yes	Students understood their roles as "experts" and stayed on task.
Student engagement and participation	High	All students actively participated, including those usually quiet.
Evidence of collaboration and peer teaching	High	Students explained concepts clearly to others in mixed groups.
Time management	Good	The activity was completed within the planned time.
Classroom atmosphere (respect, listening, support)	Positive	Respectful listening, turn-taking, and support were observed.
Learning outcome achieved	Mostly	85% of students demonstrated understanding in final summary activity.
Areas for improvement	-	Some students needed prompts to help teach peers confidently.

Inferential Statistics

Paired-samples t-tests revealed significant gains

- TPS: $t(174) = 21.45$, $p < .001$, $d = 1.52$
- Jigsaw: $t(177) = 24.67$, $p < .001$, $d = 1.85$

An independent-samples t-test found a significant difference in post-test scores

$t(351) = 3.48$, $p = .001$, $d = 0.37$

Table: Sample CSAT Items and Mean Scores

Sample Reflective Journal Entry (from a Pre-Service Teacher)

Participant ID

TPS-014

Date

Week

Technique Used

Think-Pair-Share

Prompt

"Reflect on your experience with today's collaborative activity. What did you learn, and how did it help you grow as a future educator?"

Reflective Journal Entry

Today's Think-Pair-Share session helped me realize the power of structured dialogue. At first, I was unsure how to express my ideas clearly, but after the 'think' phase, I had time to organize my thoughts. During the 'pair' discussion, my partner offered a new perspective I hadn't considered, and this deepened my understanding of inclusive classroom practices. Sharing our ideas with the larger group gave me more confidence to speak publicly. I also noticed that I'm more comfortable when I know I've had time to think first. I believe this technique will help my future students feel more secure in participating too. I plan to use Think-Pair-Share frequently when I become a teacher, especially in subjects that require reflection and personal opinion.

Observer

Dr. Mehta

Class

B.Ed. Year 1

Date

14 February 2025

Strategy Observed

Jigsaw Method

Duration

60 minutes

Number of Students

22

Discussion

The findings from this study highlight the significant role that collaborative pedagogical techniques, specifically Think-Pair-Share (TPS) and Jigsaw, play in enhancing the learning experiences of pre-service teachers. Both methods foster an environment conducive to active engagement, critical thinking, and peer interaction, which are essential components in teacher training programmes. The comparative analysis indicates that while both strategies effectively promote collaborative learning, they yield distinct outcomes in terms of student engagement and knowledge retention. TPS encourages immediate peer interaction, allowing students to articulate their thoughts and receive instant feedback, which can significantly enhance comprehension and retention of material. This technique's simplicity and adaptability make it particularly beneficial in large classroom settings where individual participation might otherwise be limited. Conversely, the Jigsaw technique promotes deeper collaborative learning by necessitating interdependence among students. Each participant becomes an expert on a specific segment of the content, thereby fostering a sense of responsibility towards their peers' learning. This method not only reinforces individual accountability but also cultivates essential skills

such as communication, problem-solving, and teamwork, which are vital for future educators. The implications of these findings suggest that integrating both TPS and Jigsaw into pre-service teacher training curricula could provide a more robust framework for developing pedagogical skills. Educators should consider the contextual factors that may influence the effectiveness of each strategy, such as class size, subject matter, and the specific learning objectives. Future research could further explore the long-term impact of these techniques on teaching efficacy and student outcomes in real classroom environments. Ultimately, fostering collaborative pedagogy through these methods can significantly enhance the preparedness of future teachers, equipping them with the necessary tools to navigate the complexities of modern educational landscapes.

Conclusions

In conclusion, this study highlights the significant benefits of employing collaborative pedagogy in pre-service teacher training, specifically through the Think-Pair-Share and Jigsaw techniques. Both methods facilitate deeper engagement, enhance critical thinking skills, and promote a supportive learning environment. The comparative analysis revealed that while each technique has its unique advantages, their integration can lead to a more holistic educational experience. Future research should explore long-term impacts on teaching efficacy and student outcomes, ultimately contributing to the development of more effective teacher training programmes that embrace collaborative learning methodologies.

References

Aronson, E., Blaney, N., Stephan, C., Sikes, J., & Snapp, M. (1978). *The jigsaw classroom*. Sage Publications.

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education, 7*(1), 22–30. https://doi.org/10.21061/jte.v7i1.a.2

Johnson, D. W., & Johnson, R. T. (1989). *Cooperation and competition: Theory and research*. Interaction Book Company.

Kagan, S. (1994). *Cooperative learning*. Kagan Publishing.

Lyman, F. (1981). The responsive classroom discussion: The inclusion of all students. In A. S. Anderson (Ed.), *Mainstreaming Digest* (pp. 109–113). University of Maryland Press.

Slavin, R. E. (1995). *Cooperative learning: Theory, research, and practice* (2nd ed.). Allyn & Bacon.

Topping, K. J. (2005). Trends in peer learning. *Educational Psychology, 25*(6), 631–645. https://doi.org/10.1080/01443410500345172