



Effects of Team-Teaching and Jigsaw Strategies on Performance and ... Bara'u. R. & Mustapha. A. (2026)

Effects of Team-Teaching and Jigsaw Strategies on Performance and Retention of Students in Federal University of Education Zaria, Kaduna State, Nigeria

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Abstract

This study investigated the effects of Team-teaching and Jigsaw strategies on students' performance and retention of micro-teaching skills in the Teacher Education Programme at the Federal University of Education, Zaria. The study was guided by four research questions and four null hypotheses. A quasi-experimental research design was adopted for the study. The population comprised 2,138 NCE II students in the School of Arts and Social Sciences, while a sample of 195 students from three intact classes was selected purposively. Two intact classes served as the experimental groups, while one intact class served as the control group. The experimental groups were taught micro-teaching skills using the Team-teaching and Jigsaw strategies, respectively, while the control group was taught using the conventional lecture method. A researcher-developed instrument titled Teaching Skills Performance and Retention Ability Test (TSPRAT) was used for data collection. The instrument was validated by relevant experts and yielded a reliability coefficient of 0.83 after pilot testing. Mean and standard deviation were used to answer the research questions, while independent-samples t-test was used to test the null hypotheses at the 0.05 level of significance. The findings revealed that students taught using Team-teaching and Jigsaw strategies performed significantly better than those taught using the conventional lecture method. However, there was no statistically significant difference between the performance of students taught using Team-teaching and Jigsaw strategies. Similarly, no statistically significant difference was found between the retention scores of students taught using the two strategies. The study concluded that both Team-teaching and Jigsaw strategies are useful alternatives to the conventional lecture method for improving students' performance in micro-teaching skills. It was recommended that lecturers should be encouraged and trained to apply these strategies where pedagogically appropriate, among others.

Keywords: Team-teaching, Jigsaw strategy, Micro-teaching skills, Performance, Retention

Introduction

Constructive pedagogical strategies for teacher education that foster meaningful exchanges between teachers, active engagement of learners, and more in-depth learning of academic content are needed for effective teaching and learning. Team teaching and cooperative learning are among the pedagogical techniques that have been the focus of increasing research interest. Team teaching is usually the practice of two or more professionals that plan, organise, deliver, and, sometimes, evaluate the teaching for the same group of learners. Team teaching has recently been discussed as a potential instructional strategy in which the complementary skills of teachers can be combined for the benefit of teaching and learning but its effects can vary based on the nature of the collaboration in specific contexts (De Weerd et al., 2025). Thus, in teacher education, team teaching can offer



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opportunities for the teacher trainers to share their professional knowledge, demonstrate collaborative professional working, and offer the learners a range of viewpoints on academic content. Today's educational institutions increasingly face the challenge of teaching and learning that is now more complex and requires alternative teaching and learning approaches that do not solely depend on a single lecturer, but on a way of learning that is active. These arrangements of teaching and learning can provide opportunities for teachers and learners to acquire academic support in multiple ways when multiple learners with diverse needs are involved in the same class, the material being taught is more complex, and teachers need to be more involved up close and personal. Recent research at higher education institutions has demonstrated that co-teaching has the potential to impact learners' experiences, engagement, and satisfaction with their learning and can afford opportunities for lecturers to engage in collaborative reflection on their teaching (Zach & Avugos, 2024). Likewise, pre-service teacher education studies have shown that cooperation between teachers and university teachers can help cultivate teachers' professional skills and enhance the practical training of teachers' education (Zhang et al., 2024).

Team teaching is therefore a topic of special interest to teacher preparation because prospective teachers' work is expected to include acquiring abilities that involve collaboration, communication, reflection, and effective interaction with other education professionals. Collaborative teaching, however, also demands clarity of roles, purpose, coordination and cooperation of all involved teachers, and its effectiveness is likely to be contingent upon the organisation and implementation of the teaching partnership (Malmström & Zhou, 2025). Based on these factors, it is important to continue empirical studies on the effect of team-based instructional strategies on students learning outcomes. Structured collaboration among students is also a way to effectively promote learning, in addition to collaboration among teachers. Cooperative learning is the general term for carefully structured learning activities in which students collaborate with one another to achieve a common learning objective and are responsible for their own work and contribution to the group. Cooperative learning, unlike ordinary or unstructured group work, needs intentional organization of learning activities and interaction among the members to facilitate them to share ideas, provide explanations for concepts, and build understandings as a group. Science education studies in recent years suggest that when the activities of cooperative learning are planned and executed systematically and correctly, it can positively impact academic success (Yaşar et al., 2024). A recent systematic review of cooperative learning in higher education physics also found that cooperative learning methods can enhance student learning and engagement, but their effectiveness can vary by type of cooperative learning, discipline, and teaching style (Kilpeläinen-Pettersson et al., 2025). A recent quasi-experimental study that compared the learning preferences of students in the lecture-based and cooperative learning groups found differences in students' learning outcomes, communication skills and attitude, which once again showed that structured student collaboration has educational value (Farhadi et al., 2024). Cooperative learning should not be viewed as a panacea for the effectiveness of any other type of teaching, but rather as a framework for teaching where the success is dependent on the learning task, instructional context, and quality implementation. These factors can serve as a useful starting point to analyze cooperative learning strategies, such as the Jigsaw strategy, in teacher education environments. The Jigsaw strategy is one type of structured cooperative learning. The learning material is broken into chunks, then students are structured in such a way that each student is responsible for mastering a different segment of the learning material, and then teaching it to the other students in their groups. This encourages responsibility as well as interdependence between learners since the successful completion of the learning task relies on the contributions of



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all the group members. Recent systematic reviews have identified Jigsaw as one of the most widely studied cooperative learning approaches, and have explored the connection between Jigsaw and academic achievement, motivation, social relations and other educational outcomes. The results found across studies however, have not all been consistent, as results depend on a range of factors, including learner characteristics, subject/content taught, and conditions of strategy implementation (Cochon Drouet et al., 2023; Vives et al., 2025). Such differences further reinforce the need to investigate the strategy on a case-by-case basis.

The current study is relevant to the Jigsaw strategy because of its focus on students' active involvement, peers' explanation, individual accountability, and the collaborative building of understanding. The act of studying some learning material, as well as discussing it with peers, followed by an explanation to peers from other groups, can make students listen and study more deeply than if they simply listened without doing other things. This active processing could be related not just to what students are learning now, but to what they have learned in the past. However, there is recent evidence that the learning outcomes resulting from Jigsaw cannot be generalised without empirical validation to other courses and learning settings (Cochon Drouet et al., 2023; Vives et al., 2025). Therefore, it is important to study the performance of the strategy in particular programmes and subjects in teacher education institutions in Nigeria. Teacher education programmes play an important role in the development of the education system as they serve the purpose of producing teachers who will engage in the teaching and learning process at various levels of education. Instructional experiences delivered through such programmes can thus impact students' current learning and their professional practice. It is especially critical to choose and assess the effectiveness of suitable instructional strategies. Traditional teaching models that focus on the lecturers may still be adopted in higher education; but greater attention has been paid to models that focus more on collaboration among lecturers and greater activities among students. Team teaching and Jigsaw strategy are two different yet complementary ways of teamwork: team teaching involves collaborative teaching among teachers in planning and delivering instruction and Jigsaw is collaborative teaching among learners in building and sharing knowledge. It is especially relevant in learning contexts that involve students' understanding, application, and subsequent recall of complex instructional content. In some teacher education contexts, the large class sizes and lack of opportunity for interaction with students can lead to instructional problems, and the potential for strategies that foster more active engagement with the content of the course is explored. It is not a given that lecturers are not willing to share expertise or that students' learning is doomed to be poor due to poor collaboration; these are issues that need to be substantiated on empirical grounds. Therefore, the current research takes an instructional approach to the problem, testing whether students' learning outcomes can be measurably different when they use deliberately designed collaborative instructional strategies.

Accordingly, the study investigated the effect of team teaching and Jigsaw strategies on students' academic performance and retention of learning in teacher education programmes in Nigeria. In particular, the study was guided by the assumption that instructional practices that encourage purposeful collaboration among teachers and active engagement of students may have an impact on student understanding of academic content, ability on assessment tasks, and their retention of previously studied material. The study is an empirical comparison of the results of team teaching and Jigsaw strategy which provides evidence on the suitability and effectiveness of these instructional strategies in the teacher education context. This study was limited to NCE II students in the Art and Social Science of the school. It was made to cover issues related to EDU 214 (Micro-



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teaching (theory) course in Education. Specifically meaning of teaching skills, skills of set-induction, motivation & reinforcement, classroom control and use of chalkboard.

Review of Related Literature

Team teaching consists of two or more teachers or other professionals in education working together in the planning, delivery, and in some cases the evaluation of instruction for a common group of students. Team teaching, co-teaching, collaborative teaching, and shared teaching are used interchangeably in the literature, but are not synonymous. The interpretation can vary according to the educational setting, the nature of the profession of those involved and the degree to which the planning and instruction is truly shared. It is important, therefore, to clearly define the concept in relation to the specific type of collaboration being studied, and not equating all forms of teaching that involve more than one teacher as "collaboration. The modern view of team teaching is that of an instructional team consisting of two or more professionals who teach a single group of students. A systematic review of experimental research on team teaching by De Weerd et al. (2025) defined team teaching as a promising instructional approach that features multiple educators working together to deliver education. Their review, however, also highlighted the importance of better conceptualisation and study design for researching the effectiveness of team teaching. This is important because the result of the team teaching could be dependent on the quality of the collaboration of the two teachers, the division of the teaching load, the nature of the subject matter, and the model used for the team teaching.

Research on co-teaching and other collaborative models has also shown that collaborative forms of teaching are not a one-size-fits-all type of program and that there are multiple forms of collaborative teaching. To address this, Vembye et al. (2024) conducted a systematic review and meta-analysis of co-teaching and related collaborative instructional models, identifying the need to differentiate between the various types and contexts of collaborative teaching, after analyzing the findings from a vast number of treatment control studies. Recently, Du and Li (2025) also noted that a variety of co-teaching models are being implemented in educational contexts, including one-teach/one-assist, team-teaching, and other models. The results indicated that the extent of collaborative teaching effectiveness needs to be explored based on the collaborative teachers' organization and implementation of their teaching duties, not merely the number of teachers involved in teaching. The primary concept of team teaching is to work professionally toward a purpose. Teachers can use what they know, their experiences, pedagogical skills, and areas of expertise to plan and implement instruction. This partnership may afford students a variety of viewpoints on subject matter and allow teachers to share accountability for teaching and learning. But, effective team teaching goes beyond one teacher teaching as another is simply physically in the classroom. Recent studies have revealed that teachers need opportunities to grow their collaborative practices, negotiate the profession, coordinate teaching, and reflect on their collaborative work (Cochon-Drouet et al., 2023). Thus, the quality of communication, planning, understanding, and coordination among the collaborating teachers can be seen as crucial factors in the successful implementation of team teaching so it is essential to be able to have effective communication among teachers. Thus, the quality of communication, planning, understanding and coordination among collaborating teachers can be seen as crucial factors in the successful implementation of team teaching so effective communication among teachers is essential. In teacher education, team teaching is of special importance since teacher education programmes are not only expected to transmit academic knowledge, but are also expected to introduce prospective teachers to professional practices that they might face in their



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future career. However, if lecturers work together well in planning and presenting learning, students can be exposed to other professional attitudes and approaches in presenting academic content. Collaborative teaching can also serve as an example of how teachers interact with one another and practice with professionalism. However, these potential benefits must not be taken for granted. Existing systematic evidence suggests that the effectiveness of collaborative instructional arrangements is context and study dependent, thus highlighting the need for empirical evidence (De Weerd et al., 2025; Vembye et al., 2024).

Concept of Jigsaw Strategy

Jigsaw is a structured cooperative learning model where students are given responsibility for learning specific parts of the instructional content and then, responsible for teaching or sharing that content with other members of their group. The strategy was first introduced in the 1970s by Elliot Aronson et al to enhance the learning and intergroup relationships of students from different groups (Aronson et al., 1978). The strategy has evolved over time and is one of the most recognized and widely studied cooperative learning strategies. The key to the Jigsaw strategy is positive interdependence. Students do their work in such a manner that every student has information or knowledge that is essential for another student in the group. As a result, the learning task success is partly dependent on the contribution of individual students. This is unlike typical group work, where some group members might do all the work, while others work barely at all. Jigsaw learning requires all students to deliver one section of the teaching material and hence ensures some level of accountability on top of group collaboration. The Jigsaw strategy has been the subject of a number of recent systematic reviews that offer important evidence about its impact on learning. In the systematic review and meta-analysis by Cochon Drouet et al. (2023) comprising 69 studies, the authors investigated the impact of Jigsaw on learning, motivation, social relations and self-esteem. There was substantial variation across studies in the outcomes reported, and factors like sample characteristics, classroom diversity and type of instructional content were identified as possible moderators of the effectiveness of the strategy. In a similar manner, Vives et al. (2025) performed a thorough systematic review of Jigsaw research that included studies conducted over 40 years. They concluded that while generally Jigsaw has been linked to positive learning outcomes, it has varying impacts on learning outcomes by subject matter, psychosocial outcomes and the context it is used in. The results suggest that the effectiveness of Jigsaw should be viewed as a structured teaching method that is to be implemented correctly and needs to be studied empirically in each context.

Research Objectives

The following particular goals were accomplished by the study:

- 1) Determine the difference in the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and the conventional lecture method.
- 2) Determine the difference in the post-test performance scores of students taught micro-teaching skills using the Jigsaw strategy and the conventional lecture method.
- 3) Determine the difference in the post-test performance scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies.
- 4) Determine the difference in the retention scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies.

Research Questions

This paper addressed the following research questions

1. What is the difference in the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and those taught using the conventional lecture method?



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2. What is the difference in the post-test performance scores of students taught micro-teaching skills using the Jigsaw strategy and those taught using the conventional lecture method?
3. What is the difference in the post-test performance scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies?
4. What is the difference in the retention scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies?

Null Hypotheses

The study developed and tested the following null hypotheses at the 0.05 level of significance:

- H0₁ There is no significant difference between post-test performance scores of students taught micro-teaching skills using team-teaching technique and those taught using conventional lecture strategy.
- H0₂ Significant difference does not exist between post-test performance scores of Students taught micro-teaching skills using jigsaw strategy and those taught using conventional lecture strategy.
- H0₃ Post-test performance scores of students taught micro-teaching skills using team teaching technique does not significantly differ from post-test performance scores of students taught using jigsaw strategy.
- H0₄ There is no significant difference between retention ability scores of students taught micro-teaching skills using team teaching technique and those taught using jigsaw strategy.

Research Methodology

The study adopted a quasi-experimental design involving two experimental groups and one control group. The population comprised NCE II students offering selected Social Studies combinations in the School of Arts and Social Sciences, Federal University of Education, while three purposively selected intact classes consisting of 195 students constituted the sample. Experimental Group I was taught using the team-teaching strategy, Experimental Group II received instruction through the Jigsaw strategy, while the Control Group was taught using the conventional lecture method. The use of intact classes was appropriate because individual students could not be randomly assigned without disrupting the existing academic arrangements. Data were collected using a researcher-developed instrument titled *Teaching Skills Performance and Retention Ability Test (TSPRAT)*, consisting of 40 multiple-choice items with four response options. The instrument was subjected to face and content validation by relevant experts and pilot-tested on students with similar characteristics to the study participants, producing a reliability coefficient of 0.83. The treatment lasted six weeks, after which the instrument was administered immediately to determine students' performance and re-administered two weeks later to assess retention of the learned content. The research questions were answered using mean and standard deviation, while the four null hypotheses were tested using independent-samples t-test at the 0.05 level of significance. The independent-samples t-test was considered appropriate because each hypothesis involved a comparison between two independent groups.

Presentation of Results

The four null hypotheses formulated for the study were tested at the 0.05 level of significance. The inferential analyses were conducted to determine whether the observed differences in students' post-test performance and retention scores across the instructional groups were statistically significant. The results are presented in Tables 1–4.

- H0₁: There is no significant difference between the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and those taught using the conventional lecture method at the Federal University of Education, Zaria.

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Table 1: Independent-samples t-test of the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and the conventional lecture method

Variable	N	Mean	SD	df	t-cal.	Sig. (2-tailed)	Decision
Team-teaching	65	24.73	2.92	133	14.62	<.001	Sig.
Conventional	70	17.18	3.07				

Source: (Field Survey, 2026)

Table 1 presents the result of the independent-samples t-test comparing the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and those taught using the conventional lecture method. Students in the Team-teaching group obtained a higher mean score ($M = 24.73$, $SD = 2.92$) than those in the conventional lecture group ($M = 17.18$, $SD = 3.07$). The calculated t-value of 14.62 with 133 degrees of freedom was statistically significant at the 0.05 level ($p < .001$). Therefore, the null hypothesis was rejected. This indicates that there was a statistically significant difference in the post-test performance scores of the two groups in favour of the Team-teaching group.

H_{02} : There is no significant difference between the post-test performance scores of students taught micro-teaching skills using the Jigsaw strategy and those taught using the conventional lecture method at the Federal University of Education, Zaria.

Table 2: Independent-samples t-test of the post-test performance scores of students taught micro-teaching skills using the Jigsaw strategy and the conventional lecture method

Variable	N	Mean	SD	Df	t-cal.	Sig.	Decision
Jigsaw	60	24.83	2.30	128	18.53	<.001	Sig.
Post-test Conventional	70	16.03	3.00				

Source: (Field Survey, 2026)

Table 2 presents the result of the independent-samples t-test comparing the post-test performance scores of students taught micro-teaching skills using the Jigsaw strategy and those taught using the conventional lecture method. Students taught using the Jigsaw strategy obtained a higher mean score ($M = 24.83$, $SD = 2.30$) than those taught using the conventional lecture method ($M = 16.03$, $SD = 3.00$). The calculated t-value of 18.53 with 128 degrees of freedom was statistically significant at the 0.05 level ($p < .001$). Therefore, the null hypothesis was rejected. This indicates that there was a statistically significant difference in the post-test performance scores of the two groups in favour of the Jigsaw strategy.

H_{03} : There is no significant difference between the post-test performance scores of students taught micro-teaching skills using the Team-teaching strategy and those taught using the Jigsaw strategy at the Federal University of Education, Zaria.

Table 3: Independent-samples t-test of the post-test performance scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies

Variable	N	Mean	SD	Df	t-cal.	Sig. (2-tailed)	Decision
Team-teaching	65	24.73	2.91	123	-0.21	.832	Not. Sig.
Jigsaw	60	24.83	2.30				



60 24.83 2.30

Jigsaw

Source: (Field Survey, 2026)

Table 3 presents the result of the independent-samples t-test comparing the post-test performance scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies. Students taught using the Jigsaw strategy obtained a mean score of 24.83 (SD = 2.30), while those taught using the Team-teaching strategy obtained a mean score of 24.73 (SD = 2.91). The calculated t-value of -0.21 with 123 degrees of freedom was not statistically significant at the 0.05 level ($p = .832$). Therefore, the null hypothesis was not rejected. This indicates that the study found no statistically significant difference between the post-test performance scores of students taught using the Team-teaching and Jigsaw strategies.

H0₄: There is no significant difference between the retention test scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies at the Federal University of Education, Zaria.

Table 4: Independent-samples t-test of the retention test scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies

Variable	N	Mean	SD	df	t-cal.	Sig. (2-tailed)	Decision
Team-teaching	65	24.66	2.30	123	-0.29	.775	Not Sig.
Jigsaw	60	24.75	0.81				

Source: (Field Survey, 2026)

Table 4 presents the result of the independent-samples t-test comparing the retention test scores of students taught micro-teaching skills using the Team-teaching and Jigsaw strategies. Students taught using the Jigsaw strategy obtained a mean retention score of 24.75 (SD = 0.81), while those taught using the Team-teaching strategy obtained a mean score of 24.66 (SD = 2.30). The calculated t-value of -0.29 with 123 degrees of freedom was not statistically significant at the 0.05 level ($p = .775$). Therefore, the null hypothesis was not rejected. This indicates that the study found no statistically significant difference between the retention test scores of students taught using the Team-teaching and Jigsaw strategies after the specified retention interval.

Discussion of Findings

The results of the present study indicated that there was a statistically significant difference between the students' post-test performance scores of the students taught with micro-teaching skills based on the Team-teaching strategy and those taught using conventional lecture method in favour of the group of students taught with micro-teaching skills ($p < .001$). This discovery implies that a collaborative teaching of two or more lecturers may offer more opportunities for explanation, demonstration, clarification, questioning, and instructional support for students than traditional teaching by one lecturer. When instruction is divided into micro-teaching skills, in which students are expected to learn and use various skills of teaching, the presence of complementary teaching perspectives could have helped the students exposed to Team-teaching to perform better. This discovery comes on the heels of a growing volume of evidence that collaborative teaching partnerships yield positive learning outcomes when they are well designed and executed. In a systematic review and meta-analysis of the research on co-teaching and related collaborative teaching models, Vembye



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et al. (2024) analyzed a large number of treatment-control studies and found evidence of the positive effects of collaborative teaching arrangements on students' academic achievement; however, the size of the effect may vary depending on certain contextual and implementation factors. Likewise, recent experimental research in the field of Team-teaching has shown that students may have better learning outcomes in team-taught classrooms than in classrooms taught by individual teachers, but the magnitude of the difference may not always be large and may depend on classroom contexts. The results of the present finding, however, do not necessarily imply that the implementation of team-teaching always yields better learning results. The results of a recent meta-analysis conducted by Stefanidis et al. (2023) reviewed academic outcomes of co-taught and solo-taught classrooms were inconclusive and inconsistent in terms of the superiority of co-teaching across all settings. The findings may reflect the effects of variation in student characteristics, the purpose of co-teaching, the manner in which teachers collaborate, the quality of the instruction being delivered, and the way group comparability is accomplished. Therefore, the results of the present study showed that the Team-teaching method was superior to the traditional lecture method, but the result should be interpreted in the context of instructional and institutional conditions in which the study was implemented. The study also found that the post-test performance of the students who were taught micro-teaching skills with the help of Jigsaw strategy had statistical significance difference from the students who were taught using the conventional lecture method in favour of the Jigsaw strategy ($p < .001$). The mean performance score of students taught under the Jigsaw strategy was significantly higher than the mean performance score of the students who were taught by the conventional lecture method. This could relate to the active learning processes included in the Jigsaw strategy. Students will be expected to learn parts of the instruction, engage with experts in expert groups, know the instruction they are assigned, and then present the instruction to their home groups. These processes can foster active involvement, individual accountability, positive interdependence, discussion, elaboration, and peer teaching. The recent evidence about the educational outcomes of the Jigsaw method supports the present finding. In a systematic review and meta-analysis of 69 studies exploring the impact of the Jigsaw method on students' performance, Cochon Drouet et al. (2023) found that the strategy had a positive overall impact. They conducted a meta-analysis of 43 studies on achievement and discovered that overall, the impact was positive and significant, indicating that Jigsaw can be helpful in the academic learning process when implemented properly. The results of the present study are in line with evidence that structured cooperative learning offers more active learning opportunities for students to process, discuss and explain learning materials than the teacher-centred learning.

However, there is also recent evidence that the effectiveness of the Jigsaw strategy is not consistent in all educational settings. Cochon Drouet et al. (2023) discovered that there was great variation in the studies reviewed and that the impact of Jigsaw can differ depending on the characteristics of the learners, the content of the course, and the composition of classes, sample size, and how the strategy was used. Similarly, Vives et al. (2025), in their latest systematic review on the Jigsaw over the last 40 years, found that the Jigsaw strategy has positive effects overall but these are subject dependent and depend on the measure of psychosocial outcomes. Further, these mixed outcomes are significant in that they indicate that the positive outcome found in the present study cannot be exclusively attributed to the name "Jigsaw" but also to the quality of implementation and the appropriateness of the strategy for teaching micro-teaching skills. The third finding indicated that the students' performance scores in the post test were not significantly different ($p = .832$) between the students who learned micro-teaching skills in the team-teaching strategy and the students who learned micro-



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teaching skills in the jigsaw strategy. The mean score in the Jigsaw group was higher than the mean score in the Team-teaching group, but the difference was not significant. This result suggests that the performance of students' micro-teaching skills was about the same under both the instructional strategies in the present study. One possible reason for this similarity is that both strategies are designed to increase interaction and engagement with instructional material and are not the traditional lecture approach. Team-teaching encourages cooperation between teachers and could lead to students experiencing more than one explanation, demonstration, and approach to teaching. The Jigsaw approach, on the other hand, fosters student interaction through discussion with peers, individual accountability and shared building of understanding. The mechanisms are different, but both methods could have motivated students to be more involved in their learning, resulting in similar learning outcomes.

This is also in line with recent reviews that have found that the effectiveness of both collaborative teaching and cooperative learning strategies is context and implementation dependent. The authors of the systematic review and meta-analysis (Vembye et al., 2024) pointed to a number of factors which affect the outcomes of co-teaching practices. Likewise, Cochon Drouet et al. (2023) and Vives et al. (2025) showed that there are significant study-to-study and context-to-context differences in Jigsaw outcomes. Consequently, the results of the present study do not suggest that Team-teaching and Jigsaw are different in their effectiveness to promote students' learning of the selected micro-teaching content, but it does suggest that both strategies are equally effective.

The fourth finding indicated that the retention test scores of the students who used the micro-teaching skills with the Team-teaching and Jigsaw strategies were not significantly different ($p = .775$). The Jigsaw group did not achieve a significantly higher mean retention score than the Team-teaching group, but it did achieve a slightly better score. Thus, the finding suggests that both the instructional strategies were not significantly better than each other for students' retention of the learned micro-teaching content during the retention interval used in the study. This outcome could be due to the level of active learning opportunities provided by both strategies. Retention can be achieved through multiple models and explanations of a concept (team teaching) and multiple discussions, peer explanations, elaboration, and active processing of instructional content (Jigsaw). Both groups were presented with instructional techniques that could have asked for more active learning than passive listening, which could have led to similar retention results. However, the finding must be taken with a pinch of salt as recent studies by Jigsaw have revealed that contextual factors and the non-uniformity of findings in studies impact on the educational outcomes. Cochon Drouet et al. (2023) found that the impact of Jigsaw varied significantly as a function of the academic and the psychosocial variables studied, and Vives et al. (2025) reported that there was significant variation in impact according to academic and psychosocial variables studied. These observations indicate that the effectiveness of cooperative and collaborative instructional strategies for retention might vary with the type of content taught, treatment length, quality of implementation, and student participation in content and the time elapsing between instruction and the retention assessment. The present finding should, therefore, be interpreted as evidence that there are no significant differences between the two interventions in retention outcomes within the particular two-week retention period examined in the present study and not as a finding that the two strategies will necessarily produce the same retention outcomes in all educational contexts.

Conclusion



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Based on the results obtained from the findings of the study, it was concluded that the Team-teaching and the Jigsaw strategies were more effective than the traditional lecture strategy in enhancing the performance of the students in the micro-teaching skills in the Federal University of Education, Zaria. There was a significant difference between both Team-teaching and Jigsaw instructional strategies and the conventional lecture method in terms of the post-test performance scores of their students. But, the performance difference between students taught with the Team-teaching strategy and students taught with the Jigsaw strategy was not statistically significant, showing that the two instructional strategies yielded similar performance results under the conditions of the study. The study also found that, Team-teaching and Jigsaw strategies yielded similar retention results of the students after two weeks retention period. The mean scores for retention for the Jigsaw group were slightly higher, but this difference was not significant between the two groups. Thus, there was no statistically significant difference between Team-teaching and Jigsaw and in students' retention of the learned content of micro-teaching within the period investigated. In general, the study concluded that both teaching methods are presentable alternatives to the traditional lecture method for teaching micro-teaching skills and that their successful application should consider the content of the learning material, learning goals, staff, class characteristics, and proper implementation conditions.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Lecturers who teach micro-teaching and related education courses should be encouraged to use Team-teaching or Jigsaw teaching in the classroom, especially in the process of teaching and learning that needs students to be active, interactive, display, discuss and cooperate.
2. The Management of Federal University of Education, Zaria should arrange team training sessions, seminars and professional development sessions for lecturers from time-to-time on effective team teaching and jigsaw strategy.
3. The choice of either of the team-teaching or the jigsaw strategy to use must depend on the nature of the content and instructional context of the course to be taught, and not depend on the notion of either being superior or inferior to the other.
4. Education authorities and lecturers should promote instructional approaches that encourage active participation and collaboration while retaining the conventional lecture method as a complementary instructional approach where necessary.

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