The Effectiveness Of The Jigsaw Strategy In Grammar Instruction On The Achievement And Retention Of Non-Arabic Speakers

Received 2026-06-06
Accepted 2026-09-10
Published 2026-10-17

Maher Dakhil Allah Alsaedi
Arabic Language Institute for Non-Arabic Speakers, Islamic University of Madinah, Saudi Arabia
Maher987@hotmail.com

Abstract
Arabic grammar is a key element in the study of Arabic for non-native speakers, and teacher-centered methods have been found to restrict learners' involvement and retention of grammatical concepts. The study aimed at investigating the effectiveness of the Jigsaw cooperative learning strategy in enhancing achievement and learning retention of non-native speakers. A quasi-experimental design was used involving 72 male fourth-level students at the Institute of Teaching Arabic to Non-Native Speakers, Islamic University of Madinah. Participants were divided into two groups: the experimental group (n = 36) received Jigsaw-based instruction, and the control group (n = 36) received conventional instruction. A 63-item grammar achievement test was used to collect data and was administered as a pre-test, post-test, and delayed test 21 days after instruction. The instrument showed good reliability (split-half = 0.865, Cronbach's α = 0.839). Pre-test results confirmed group equivalence ($t = 1.271$, $p = 0.208$). Post-test results showed statistically significant differences, with the experimental group scoring higher ($t = -4.156$, $p = 0.001$). The experimental group showed better retention on the delayed test, although no significant difference was found between post-test and delayed-test performance. The results support the Jigsaw strategy as an effective approach for teaching Arabic grammar.
Keywords: Jigsaw; Strategy; Cooperative Learning; Arabic Grammar; Student Achievement

INTRODUCTION

Arabic grammar is considered the backbone of the Arabic language for non-native speakers, as this helps to produce language, understand language, and communicate in language. When grammatical structures are mastered, the learner is able to form meaningful sentences and coherent speech and writing (Salim, 2024; Jamaan, 2026). Grammar instruction is especially crucial in order to comprehend literary, academic, and religious texts, in which the accuracy and precision of language are essential (Ali, 2019; Ali, 2020; Abdallah & Mohd Noor, 2024).

The Arabic grammatical structures are one of the difficulties of Arabic language learning, but grammar has an important role in teaching and learning the Arabic language. Both lexical and grammatical aspects of Arabic are complex, with learners having to process multiple linguistic features at the same time in their linguistic production and comprehension (Abdallah & Mohd Noor, 2024). Despite its importance, Arabic grammar is very difficult for the students who do not learn their mother tongue in the Arabic language. Even at the upper level, problems in applying the grammatical knowledge accurately and fluently remain (Salim 2024; Abdallah & Mohd Noor 2024). Similar

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challenges have been observed among learners at the Islamic University of Madinah (Al-Saedi, 2021; Al-Najran & Othman, 2014). The need for the integration of both approaches to overcome the recurrent grammatical errors in writing and speaking observed in the students' language at the Islamic University of Madinah, Islamic University (IUM), within the context of teaching Arabic to non-native learners (NNL), has been documented in previous studies and classroom observation (Al-Saedi, 2021; Al-Najran & Othman, 2014).

The Arabic grammar teaching has been conducted mainly in a teacher-centered way by repeating formulaic sentences and memorizing grammatical rules and through the process of structured recitation. Such methods usually create a passive scenario for the learner in which he/she receives information, hardly has the chance of interacting with others or engaging in communicative discussion, and has little opportunity to apply the grammatical structures he/she has learned in communicative contexts (Abo El Seoud, 2024; Almelhes, 2024). Traditional teacher-centered approaches often emphasize memorization and rule learning while providing limited opportunities for interaction and communicative use of language (Abo El Seoud, 2024; Almelhes, 2024). Contemporary second-language research emphasizes that grammatical development is strengthened through meaningful interaction, feedback, and active learner engagement (Al-Enezi, 2020; Campo, 2026). Given these constraints, it is becoming more and more important to investigate different teaching strategies to ensure active involvement of learners, rich knowledge building, and improved grammatical knowledge in Arabic language lessons.
Sociocultural Theory (Vygotsky, 1978) and the Interaction Hypothesis (Long, 1996) emphasize the importance of interaction, collaboration, and feedback in language learning. These principles underpin cooperative learning approaches such as the Jigsaw strategy, in which learners work in home and expert groups to acquire and teach different parts of instructional content (Aronson, 1978; Slavin, 2011). Through peer teaching and shared responsibility, the strategy promotes active participation and deeper engagement with learning tasks (Kshash, 2015; Bhardwaj, 2025).

Previous research has typically found positive outcomes for the Jigsaw strategy in terms of academic outcomes and retention of learning in a variety of educational settings. The results of the studies conducted in Arabic-medium educational environments consistently showed that students who learned through the Jigsaw strategy achieved better results than those who learned through the conventional teaching method in various subjects, such as Arabic grammar, Islamic education, Qur'anic sciences, rhetoric, jurisprudence (Al-Saadoun, 2018; Al-Saadi & Al-Obaidi, 2019; Al-Humaidawi & Al-Shammari, 2020; Al-Sawaidah et al., 2021; Al-Sebai, 2024; Abu Sarhan, 2024). The studies also revealed positive impacts on learning retention and learner interaction in quasi-experimental classroom settings (Al-Juaid, 2018). Bhardwaj (2025) also conducted a meta-analytical review, which showed that the Jigsaw strategy also leads to better achievement outcomes and improved learning retention compared to traditional instruction in various educational levels and contexts. Studies on the use of the Jigsaw strategy in foreign language learning contexts have also reported its efficacy in the teaching of English grammar (Saker 2015), reading comprehension (Rashed 2022), speaking, listening, vocabulary development (Jusmaya 2023; Bećirović et al. 2022; Elbaioui & Hafdi Idrissi 2026), and so on (Kabaha 2026). For Arabic language teaching specifically, Bahroyni and Wardani (2025) showed that the application of the Jigsaw model was able to make students more active in learning, participating in learning, and

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having self-confidence, but there was some problem related to the distribution of roles and discussion time. All these research studies indicate that the collaborative nature of the Jigsaw strategy, which involves discussions among experts, interactions between peers, and mutual responsibility for learning tasks, can facilitate deeper learning and more lasting learning gains than did traditional, teacher-led learning strategies.

Although there is a growing body of studies showing the effectiveness of the Jigsaw strategy, few researchers have focused on using the Jigsaw strategy in the teaching of Arabic grammar specifically for foreign learners of Arabic in intensive language programs. Most of the work conducted so far has been around general educational issues or on foreign language situations, other than Arabic. Furthermore, there has been little research to look into the blended effects of the strategy on immediate academic performance and long-term learning retention in Arabic as a second language context. This difference indicates that the Jigsaw method needs to be investigated in the empirical context of intensive Arabic grammar teaching. Thus, the purpose of the present study is to investigate the effectiveness of the Jigsaw cooperative learning strategy for enhancing students' academic achievement and learning retention for fourth-level students in the course of Linguistic Exercises (Grammar) at the Institute of Teaching Arabic to Non-Native Speakers at the Islamic University of Madinah. How much does the Jigsaw strategy influence students' academic achievement in the Linguistic Exercises (Grammar) course at IATAS? (2) How much influence does the application of the Jigsaw strategy have on the learning retention of the linguistic exercises course (Grammar) among students at the same institute? The results are supposed to provide evidence-based input for the pedagogy of learning Arabic as a second language and recommendations for instructors and curriculum developers on how to implement effective collaborative strategies in intensive Arabic language instruction.

Cooperative learning theory is a general theory of pedagogy that includes a variety of structured cooperative learning teaching methods aimed at establishing cooperative goals, positive interdependence, and individual accountability among learners. In this context, learning is seen not as a competitive and individual learning process but as a collaborative process where learning is towards a shared learning target, and the learner is individually responsible for his/her contribution to the achievement of the learning target of the group. The use of cooperative learning has been linked to better academic results, motivation of the learners, and greater involvement in learning tasks in various educational settings (Kshash, 2015; Kaur & Singh, 2023). One of the most crucial aspects of cooperative learning is positive interdependence. It is the structural arrangement that the success of every learner is correlated to the success of the group as a whole so that the learner feels that his/her contribution is important and helpful (Kshash, 2015). Cooperative learning is characterized by positive interdependence, individual accountability, and group interaction, all of which encourage learners to participate actively and support one another's learning (Kaur & Singh, 2023).

The Jigsaw strategy is a concrete example of the cooperative learning principles of positive interdependence, in which the instructional task is divided into specific tasks that require specific experts, with each group member assigned a specific task. The Jigsaw strategy was first developed by Aronson (1978) and further developed by Slavin (2011) as a way to decrease the competition within the classroom while encouraging cooperative interaction among various learners (Abu Al-Haj & Al-Masalha, 2016). The Jigsaw strategy promotes active learning through peer teaching, discussion, and repeated

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engagement with instructional content, which may strengthen understanding and retention of knowledge.

Studies conducted across Arabic-medium educational settings consistently reported that students taught through the Jigsaw strategy achieved higher academic performance than those taught through conventional methods (Al-Shuwaili, 2017; Al-Saadoun, 2018; Al-Saadi & Al-Obaidi, 2019; Al-Humaidawi & Al-Shammari, 2020; Al-Sawaidah et al., 2021). Previous research also reported positive effects of the Jigsaw strategy on learning retention and learner interaction, with evidence suggesting benefits that extend beyond immediate classroom performance (Al-Juaid, 2018; Abu Sarhan, 2024; Bhardwaj, 2025; Al-Ahmari, 2025).

The effectiveness of the Jigsaw strategy in foreign language learning contexts has been well documented, and it has been applied in various language skills, such as instruction of grammar, reading comprehension, speaking, listening, and vocabulary development. In the field of grammar learning, Rashed (2022) and Jusmaya (2023) found that the Jigsaw strategy facilitated the students' grammatical learning significantly better than the conventional strategy, and they attributed this achievement to the opportunities for collaboration in the explanation process, as well as for receiving feedback from peers. In the same way, Bećirović et al. (2022) reported positive outcomes of cooperative learning on grammatical accuracy and communicative competence in English as a foreign language (EFL) classes, highlighting the importance of students' interaction with each other in fostering their understanding of linguistic form.

As for reading comprehension and language skills, Saker (2015) and Pariati (2018) found that the integration of the Jigsaw technique enhanced the reading skills and language skills of non-native language learners. Mutiara and Swondo (2020) and Alfaruqy (2021) found that the cooperative structure of the strategy was also effective in promoting productive language competencies related to vocabulary development and speaking skills, respectively. More recently, Kabaha (2026) and Elbaioui and Hafdi Idrissi (2026) reported more evidence of the effectiveness of the strategy in different EFL and foreign language learning contexts, respectively, and showed that the positive effects of the strategy on language achievement were not limited to any particular language proficiency area or context.

Among the key recent studies in this field was Robillos' (2025) investigation of the impact of combining the Jigsaw reading technique with pedagogical translanguaging in an EFL setting, which demonstrated that the integrated method positively enhanced students' reading comprehension and metalinguistic awareness. The results of this study show that the Jigsaw strategy is not only effective for improving learners' language skills, but it can also help learners to reflect on the structure of the language, which is important for the teaching of grammar. Various studies conducted in these foreign language settings have additionally demonstrated that the peer interaction that is promoted through the use of Jigsaw instruction is conducive to forming a supportive learning and communicative environment, which decreases learners' anxiety while providing ample opportunities for meaningful language practice (Robillos, 2025; Elbaioui & Hafdi Idrissi, 2026). The robustness of these findings based on language, language proficiency, and language instruction context further supports the evidence that the Jigsaw strategy is a powerful and effective method for language instruction.

The Jigsaw strategy has been extensively used in classroom settings involving general education and foreign language learning, but the literature pertaining to the use

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of Jigsaw in teaching Arabic to foreign learners is still relatively scarce. The studies that have been found showed that Bahroyni and Wardani (2025) used the Jigsaw cooperative learning model in Arabic language classrooms, resulting in an increase in learner participation, collaborative interaction, and self-confidence of non-native Arabic language learners. The study, however, revealed some problems that must be addressed for the successful implementation of the strategy in Arabic language settings, such as distributing the roles among the group members and insufficient time for discussion within the expert group, indicating the need for careful planning of the instructional procedures and classroom management.

Adib and Hakimi (2025) also investigated the importance of cooperative learning in the context of Arabic as a second language (A2L), noting that, in an L2 context, interaction with the L2 teacher may be learner-centered and thus may be a meaningful way of increasing the opportunities for communicative language use and promoting greater learner autonomy, which are identified as important outcomes in intensive Arabic language courses. The study also reinforced the parallel between cooperative structures and the communicative demands of acquiring the Arabic language, where this type of cooperative learning could be better adapted to the Arabic language instruction needs of non-native speakers who need continuous opportunities for meaningful language interaction. Al-Juaid (2018) also found a positive impact of the Jigsaw strategy on learning retention and collaborative interaction in an Arabic learning environment, and Al-Ahmari (2025) has also confirmed that cooperative learning strategies are still playing a significant role in the teaching of the Arabic language with their ability to create active interaction and deep learning for non-native speakers.

Notwithstanding these contributions, the findings of the current studies on the Jigsaw strategy in Arabic language teaching and learning have mainly centered on the participation of learners and teachers in the classroom without paying attention to the impact of the strategy on grammatical achievement and retention in intensive Arabic language programs. Previous studies have also covered a wide range of grammatical topics, while few studies have studied advanced Arabic grammar with a specific emphasis on the complex morphosyntactic structures that characterize its instruction for non-native learners. The evidence that is available is positive but not yet sufficiently detailed to provide a clear understanding of the role cooperative learning strategies can play in learning and retaining specific grammatical structures of Arabic in intensive instructional settings.

Although there are numerous reports of the effectiveness of the Jigsaw strategy in different educational and language learning settings, there has been little research investigating the implications of the Jigsaw strategy for Arabic grammar teaching for non-native speakers, especially intensive Arabic language programs. Furthermore, there are limited studies that examine both achievement and retention in this context. This study fills this gap by assessing the effectiveness of the Jigsaw strategy when using it with fourth-level students at the Institute of Teaching Arabic to Non-Native Speakers at Islamic University of Madinah.

METHOD

This study employed a quasi-experimental design involving an experimental group taught through the Jigsaw strategy and a control group taught through conventional instruction. Data were collected through pre-test, post-test, and delayed-test measures.

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This design was considered appropriate because the study was conducted in an authentic educational setting where full random assignment was not feasible (Cohen et al., 2018). Table 1 presents the experimental design of the study.

Table 1. Experimental Design of the Study

Group	n	Pre-test	Treatment	Post-test	Delayed Test
Control	36	✓	Conventional instruction	✓	After 21 days
Experimental	36	✓	Jigsaw strategy	✓	After 21 days

Note. ✓= assessment administered to both groups.

This study took place at Islamic University of Madinah at the Institute of Teaching Arabic to Non-Native Speakers (IATAS) during the second semester of the academic year (2023–2024). A purposive sample of 72 fourth-level male students was selected from two intact classes at the Institute of Teaching Arabic to Non-Native Speakers. The classes were assigned to experimental and control groups, each consisting of 36 students. The grammatical topics covered were four topics, which are found in the fourth-level course textbook of Linguistic Exercises (Grammar): absolute object (*المفعول المطلق*), circumstantial accusative (*الحال*), specification (*التمييز*), and exception (*الاستثناء*). The same grammatical content was covered during the same length of instruction for both groups, and the same teacher provided instruction, thus reducing the possibility of the effects of instructional time, content covered, and the teacher's influence. It is important to highlight that the sample consisted of boys only, meaning that the generalizability of the data to mixed-gender or female learning environments might be restricted.

Data Collection Techniques

A researcher-made grammar achievement test was used to collect data that would assess students' understandings and uses of the four grammatical topics selected. The final version of the instrument included 63 multiple-choice items with four response alternatives for each, of which only one is correct, and for which no mark is awarded for an incorrect response. The items were designed to cover the learning objectives from each of the four grammatical units, and at the appropriate level, the language of the items and the answers was used. The items were written to address the learning goals of all four grammatical units using level-appropriate language, and answer options were randomly distributed.

An initial version of the test with 40 items was presented to a group of six expert judges in the field of teaching Arabic to non-native speakers for face validity. Each item was judged on clarity, cognitive suitability, and conformance with the learning objectives. The recommendations were used to revise items and to additionally develop items so that each grammatical topic would have comprehensive coverage of all the items with respect to the learning outcomes, resulting in a final instrument of 63 items. The content validity was also established by assigning each of the test items directly to the learning goals of the instructional units that were part of the study. This instrument was then tested on 18 students not included in the study sample. The two reliability estimates were computed: split-half reliability coefficient (0.865) and Cronbach's alpha coefficient (0.839), which both showed a high level of internal consistency and were adequate for research applications (Cohen, 1988). The pre-test, post-test, and delayed achievement test were completed at all three data collection points using the same 63-item test.

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Data collection was carried out in three stages. The first phase included all students being given the grammar achievement test as a pre-test before the instructional intervention to confirm the initial group equivalence. The second phase involved each group taking the post-achievement test as soon as after the end of instruction to assess academic achievement. The third phase involved a delayed achievement test 21 days after the posttest, so as to determine the extent of the retention of grammatical knowledge over time.

The experimental group was taught using the Jigsaw cooperative learning strategy during the instructional time. Thirty six students were divided into six home groups, each consisting of six students from the different groups. Thirty-six students were divided into six home groups, each group consisting of students from different groups. The 4 target lessons were broken up into 5 instructional tasks, with each task having a learning outcome, and each student was assigned to one lesson and one task, and one student was assigned to be an expert in each of the 5 tasks. Students were then grouped into experts' groups (where students with the same task from the different home groups were put together) to discuss, clarify, and consolidate their understanding of the content assigned. After the expert-group sessions, every student went back to their home group, where they presented their component to the other members of their group. This instructional cycle was used in each of the four grammatical lessons that form the study. The entire instructional procedure of the Jigsaw strategy as implemented is shown in Figure 1. The control group was taught using the traditional teacher-centered method, in which the teacher was responsible for transmitting the grammatical content by presenting it first directly, then by working examples and questions and answers in a structured manner in the whole class without using cooperative learning procedures.

Data Analysis

The statistical package for the social sciences (SPSS) was used for quantitative data analysis. Means and standard deviations were calculated to provide descriptive statistics of both groups' performances in the three phases of assessment. An Independent Samples t-test was used to compare the experimental and control groups on the pre-achievement and post-achievement tests. Learning retention was determined by comparing the post-test and delayed test scores for each group independently using a paired-samples t-test. The significance level used to make all the statistical comparisons was a ≤ 0.05. The analytical procedures chosen were selected to provide a high-quality and valid analysis of the impact of the Jigsaw strategy on achievement and retention in non-native Arabic speakers' learning.

RESULTS AND DISCUSSION

Effect of the Jigsaw Strategy on Academic Achievement

The first research question investigated the effectiveness of applying the Jigsaw cooperative learning strategy in the Linguistic Exercises (Grammar) course on the students' academic achievement. To this end, two Independent Samples t-tests were employed: One test to ensure the equivalence of the two groups before entering into the instructional experience and a second test to compare the performance of the experimental group with the control group after the instructional experience. All participants in both groups took the grammar achievement test as a pre-test prior to the intervention. Table 2 shows the findings of the pre-test comparison.

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Table 2. Independent Samples t-Test: Pre-Achievement Test

Group	n	Mean	SD	df	t	p
Control	36	37.083	16.352	70	1.271	0.208
Experimental	36	32.750	12.292			

Note: p > .05 indicates no statistically significant difference between groups.

No statistically significant difference was observed with the pre-achievement test (t = 1.271, p = 0.208), as indicated in Table 2. The probability value was not statistically significant (p > 0.05); the experimental group had a slightly lower mean score (M = 32.750, SD = 12.292) than the control group (M = 37.083, SD = 16.352). The larger the standard deviation of the control group is, the more the grammatical knowledge is varied among the control group participants at the baseline level. However, the lack of a statistically significant difference before the study started suggests that the two groups statistically did not differ prior to the study. In quasi-experimental studies, this initial equivalence is an important consideration because any differences found in post-test and delayed test scores can be confidently attributed to the instructional intervention conducted rather than any differences found before the intervention was conducted (Cohen et al., 2018).

Both groups took the post-achievement test after the instructional intervention. The findings of the comparison of the post-test are shown in Table 3.

Table 3. Independent Samples t-Test: Post-Achievement Test

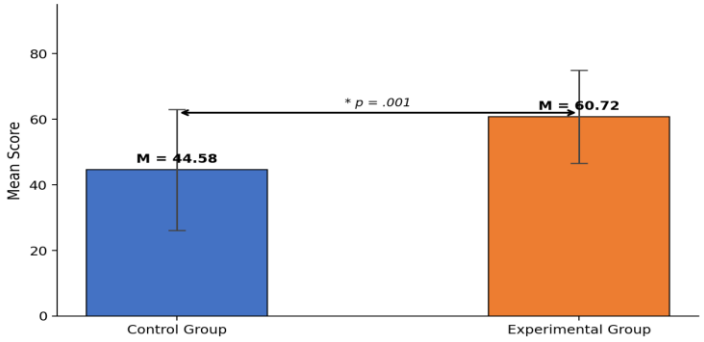
Group	n	Mean	SD	df	t	p
Control	36	44.583	18.470	70	−4.156	0.001
Experimental	36	60.722	14.199			

*Note. *p < .05 indicates a statistically significant difference in favor of the experimental group.*

Table 3 shows that there was a significant difference between the two groups in favor of the experimental group on the post-achievement test (t = −4.156, p = 0.001). The results showed that students in the experimental group (M = 60.722, SD = 14.199) had a significantly higher mean score than the students in the control group (M = 44.583, SD = 18.470), suggesting that the Jigsaw strategy had a positive and significant impact on students' grammatical achievement. In particular, the mean gain that was observed for each group from pre-test to post-test is worth noting: For the experimental group, the mean gain was 27.972 points (pre-test M = 32.750; post-test M = 60.722), while the mean gain for the control group was 7.500 points (pre-test M = 37.083; post-test M = 44.583). This tremendous difference in learning gain—nearly four times as great—shows the significantly higher instructional effectiveness of the Jigsaw strategy compared to traditional teaching. Furthermore, the standard deviation of the experimental group (SD = 14.199) was significantly lower than that of the control group (SD = 18.470), indicating that the mean achievement attained by the experimental group was more consistent and homogeneous across the group than the mean achievement obtained by the control group.

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Figure 2
Comparison of Post-Test Mean Scores between Groups



The results showed that the Jigsaw cooperative learning strategy was significantly superior to the traditional teacher-centered approach in improving the second language, Arabic, grammatical achievement of students. A number of interrelated pedagogical, cognitive, and sociocultural factors might explain this result. First, the instructional material was broken down into specific topics and tasks that were specialized for experts, and the students were asked to work on each topic in-depth and deliberately and then explain it to their peers. This level of deep task engagement could have helped learners to establish more precise and systematic mental schemas of grammatical relationships, such as the intricate morphosyntactic patterns found in Arabic grammar—inflection and case and agreement patterns and sentence-level syntactic relations. that have always been reported as recurring difficulties for non-native speakers of Arabic (Salim, 2024; Abdallah & Mohd Noor, 2024). Unlike traditional teaching, the teacher in the jigsaw approach did not present content as a whole but rather divided it into parts so that each learner could focus on a specific piece of the content; this enabled more targeted knowledge processing and thus a more effective learning of the grammatical content (Kaur & Singh, 2023).

Second, the expert-group phase provided opportunities for structured learning and negotiating understanding. These sessions provided an opportunity for learners from the same home group to meet and review, discuss, and clarify the grammar content to which they have been assigned. The interaction and supporting experience is a collaborative experience that is in keeping with Vygotsky's (1978) sociocultural theory of knowledge construction, which suggests that knowledge is constructed socially and through scaffolding by peers in the zone of proximal development (ZPD). Working with peers with different levels of knowledge of different grammatical structures allowed learners to receive differentiated support, which helped them better process grammatical knowledge than they would have on their own. Means of clarifying grammatical ambiguities and of co-constructing grammatical understanding that were observed in the co-construction process within the expert groups could have meaningfully contributed to the gains in achievement that were observed in the experimental group.

Third, the peer-teaching part in which each specialist went back to his/her own group to share his/her part is one of the most cognitively demanding and pedagogically most important parts of the Jigsaw strategy. When a student is asked to teach another student the grammatical rules, they will need to recall information, structure it in a logical manner, break daunting relationships down, and answer questions and misconceptions as they are asked. This process is consistent with the Interaction Hypothesis of Long (1996), which has focused on meaningful interaction. such as negotiation of meaning, noticing of

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gaps in the learner's language, and immediate corrective feedback to support language development. In the peer teaching sessions, learners were asked to explain the rules of grammar, give examples for them, and solve language problems of their peers, which would not happen when they passively receive the teacher's explanation.

Moreover, the small group learning collaboration resulting from the use of the Jigsaw strategy could have lowered the anxiety level and boosted confidence of the learners so that they could practice the grammatical structures more freely in their small groups than in the whole class, teacher-fronted learning environment of traditional learning (Bhardwaj, 2025; Adib & Hakimi, 2025). The affective dimension of cooperative learning could be important in an Arabic as a second language context, where the morphosyntactic complexity of the Arabic language systems might bring high anxiety for second language learners (Bahroyni & Wardani, 2025).

The results are in line with a large number of previous studies that found positive outcomes of the Jigsaw strategy in various educational settings. The same findings were reported by Al-Shuwali (2017), Al-Saadoun (2018), Al-Saadi and Al-Obaidi (2019), and Abu Sarhan (2024) in Arabic-medium schools, in which the application of the Jigsaw approach in teaching significantly enhances student learning achievement compared to traditional teaching. The results of the metaanalytical study carried out by Bhardwaj (2025) also support these findings on a variety of educational levels and subjects. The same results have been found in the field of foreign language learning, with Rashed (2022) and Jusmaya (2023) reporting higher grammatical proficiency and language achievement, respectively, for learners using cooperative learning structures, as well as Bećirović et al. (2022), Kabaha (2026), and Elbaioui and Hafdi Idrissi (2026). Moreover, in the field of Arabic language learning, Bahroyni and Wardani (2025) and Adib and Hakimi (2025) also attributed the jigsaw-based instructional approach as being collaborative and learner-centered, which made learners participate actively and achieve well.

The present study builds on this line of research by showing that the Jigsaw strategy is effective in this specific context, namely, in Arabic as an advanced language course for non-native speakers taught in an intensive Arabic language program where the grammatical structures taught are highly morphosyntactic and the population of learners is linguistically diverse and where the program is taught intensively. These contextual features differentiate the current research from most of the available literature and provide relevant information to the evidence base of cooperative learning in the teaching of Arabic as a second language.

Effect of the Jigsaw Strategy on Learning Retention

The second research question investigated how much students learned when they were taught with the Jigsaw strategy in the course of Linguistic Exercises (Grammar). In order to answer this question, paired-samples t-tests were used within each group for comparing scores on the post-test with scores on the delayed test, which were administered 21 days after the end of instruction. The results of the control group are given in Table 4, and the results of the experimental group are shown in Table 5.

The results presented in Tables 4 and 5 indicated that there were no statistically significant differences between post-test and delayed test scores for the control group ($t = -0.007$, $p = 0.901$) and the experimental group ($t = 0.294$, $p = 0.770$). This suggests that both groups' grammatical performance remained fairly consistent over the 21-day

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retention period. The pattern, however, is important and substantively meaningful: The mean score for the experimental group did not change significantly over time (M = 60.305, SD = 14.378) on the delayed test, while the mean score for the control group was significantly lower on the delayed test (M = 44.611, SD = 14.347). The experimental group test mean score (M = 60.305) was also significantly higher than the control group test mean score (M = 44.583) after 21 days when no instruction was given; thus, the students in the experimental group could have acquired grammatical knowledge that was higher than the immediate post-instructional performance of students in the control group. This pattern is meaningful from a qualitative and practically significant way of retaining a positive effect for the Jigsaw strategy.

Table 4. Paired-Samples t-Test: Control Group: Post-Test vs. Delayed Test

Test	n	Mean	SD	df	t	p
Post-test	36	44.583	18.470	35	−0.007	0.901
Delayed test	36	44.611	14.347			

Note: p > .05 indicates no statistically significant difference between post-test and delayed test scores.

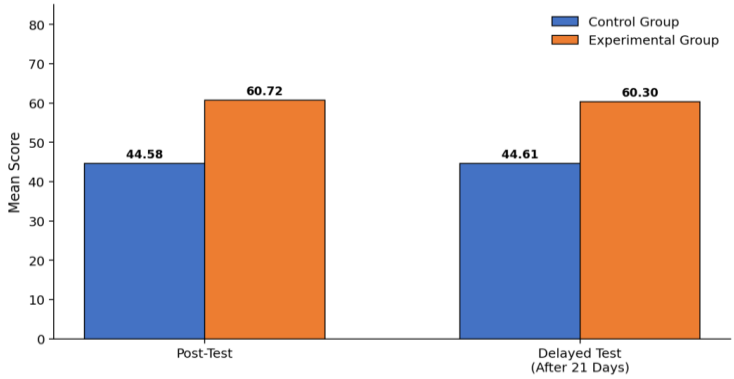
Table 5. Paired-Samples t-Test: Experimental Group: Post-Test vs. Delayed Test

Test	n	Mean	SD	df	t	p
Post-test	36	60.722	14.199	35	0.294	0.770
Delayed test	36	60.305	14.378			

Note: p > .05 indicates no statistically significant difference between post-test and delayed test scores.

Within-group comparisons further elucidate the retention processes of each condition. The mean scores of the control group showed a marginal increase from the post-test (M = 44.583) to the delayed test (M = 44.611) with a difference of only 0.028 points, which indicated that the grammatical knowledge gained in the conventional instruction was stable but not very high, and it was not increased or decreased significantly over the period of time between the post-test and the delayed test. The mean score of the experimental group was slightly lowered at the delayed test (M = 60.305), with only a 0.417-point difference, which is in the range of standard deviation (SD = 14.199–14.378) and is negligible enough to be practical. Notably, both groups converged in their delayed test standard deviations (Control: SD = 14.347; Experimental: SD = 14.378), indicating that the variability of performance did not differ between the two groups over the course of the retention interval, but rather the significant mean difference between groups remained.

Figure 3
Retention Performance: Post-Test vs. Delayed Test by Group



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Results of the retention indicated that the advantage of Jigsaw-based teaching was far greater than the teaching time itself and that the complex Arabic grammar could be remembered for a long time. There are several possible cognitive and pedagogical mechanisms that explain this continued advantage. One of the main reasons is the several steps of the Jigsaw strategy, which were provided during the teaching/learning process. The Jigsaw strategy, unlike traditional teaching in which the content of grammar is often presented in one way, teacher-explanation, exposed students to the grammatical content several times: first, independent preparation and study of the assigned content; second, discussion and clarifying grammatical content by the expert group; third, discussion and clarification of assigned content by peers in home groups; and finally, the completion of the post-test individually. Multiple and varied retrieval practice opportunities were created in each stage as learners retrieved, organized, and applied their grammatical knowledge in various communicative settings. Cognitively, learning with multiple retrievals from LTM, especially multiple different forms of the same information in different contexts, will be correlated with better memory consolidation and longer retention than learning by a single exposure (Cohen, 1988). The distributed and multi-stage nature of the Jigsaw teaching model might have, therefore, facilitated the encoding of grammatical knowledge and facilitated the access to grammatical knowledge over time.

The second is an important one that involves the depth of the cognitive processing that is stimulated by the peer teaching requirement. By providing explanations for grammatical rules to their peers, creating examples based on that explanation, answering questions from peers, and resolving misunderstandings, students are doing more than just processing at a superficial level that occurs when they hear the teacher's explanation and follow the instructions in an exercise. This level of processing involves learners integrating, evaluating and communicating grammatical knowledge, and can result in more robust representations of grammatical structures in the mind that will be harder to forget over time. This interpretation is in line with the sociocultural perspective, which focuses on the nature of collaborative interaction and knowledge construction together that helps in long-term learning (Vygotsky, 1978).

Third, due to the communicative aspect of the Jigsaw strategy, it is possible that the grammatical structures were made more functional in terms of meaningfulness for the learners. Learners may be better equipped to see how the knowledge of the grammatical concepts relates to communication and what the function is if the concepts are discussed and explained in meaningful interaction between peers rather than just memorized as rules. Learners may feel more confident about the communicative relevance and functional value of the knowledge of grammatical concepts when there is meaningful peer interaction that provides for their discussion, explanation, and application. This functional meaningfulness may enhance the salience of grammatical structures in learners' LTM and ease retrieval when applying the structures in real situations, particularly in the context of learning Arabic as a second language where learners may struggle to transfer explicit knowledge of the L1 system to the L2 system (Abdallah & Mohd Noor, 2024; Salim, 2024).

Fourth, the continuous and recurrent opportunities for corrective feedback and negotiated understanding in the course of the collaborative peer interaction in both the expert group and the home group stages could have created a continuous context for the process of stabilizing and consolidating grammar over time (Long, 1996). Learners might

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have built up more reliable representations of the target grammatical structures by explanation and clarification, making them less likely to forget and more reliable retrieval after the instructional period. This collaborative negotiation and feedback might have been especially useful for students who were initially perplexed by certain grammatical structures, allowing the ZPD to reinforce their comprehension of these elements that may have been weak or incomplete (Vygotsky, 1978).

The results of this study are consistent with the previous studies that showed positive effects of cooperative learning on long-term academic performance. In the field of Arabic education, Al-Juaid (2018) found that the Jigsaw strategy had a positive impact on learning retention in a quasi-experimental educational context, and Al-Ahmari (2025) highlighted its ongoing pedagogic role for teaching Arabic and its ability to enhance sustainable learning outcomes. Adib and Hakimi (2025) also pointed out the importance of an interaction that is learner-centered for ensuring the acquisition of durable knowledge by non-native Arabic speakers. However, the meta-analytic data presented by Bhardwaj (2025) also support that cooperative learning strategies have better retention than traditional instruction in various learning settings.

However, the present study builds upon these findings in a number of significant ways. First, it offers direct evidence from intensive Arabic grammar instruction, which has been relatively little studied in the previous body of research on retention. Second, it analyzes retention of complex morphosyntactic structures that are uniquely difficult to master for non-native speakers of Arabic, suggesting that cooperative learning could be helpful in the retention of not only general academic material but also dense material in terms of multiple interacting linguistic features. Third, the 21-day retention interval used in this study is a valid interval in the real world, which indicates that the retention benefits found are likely to be clinically significant when planning instruction in Arabic language programs.

The results of the present study indicate that, generally speaking, the Jigsaw cooperative learning strategy is more effective than the conventional teacher-centered teaching for teaching grammatical content and retention of grammatical content for non-native Arabic-speaking learners. The findings in the present study suggest that CL strategies can be implemented in Arabic grammar teaching, more specifically, in intensive language learning programs in which students are expected to learn complex morphosyntactic structures within limited time frames. The theoretical linkage of these findings with the sociocultural (Vygotsky, 1978), interactionist (Long, 1996), and cognitive (Cohen, 1988) perspectives on learning is strong and offers a good framework for explaining why the results are obtained and the potential uses of the structures of the Jigsaw strategy for optimum grammatical output and retention in Arabic as an L2 classroom.

CONCLUSION

The jigsaw cooperative learning strategy is the strategy that was used in the present study to improve the achievement and retention of fourth-level non-native Arabic-speaking students in the context of linguistic exercises (grammar) at the Islamic University of Madinah (IUM). A quasi-experimental design was used where 72 male students in two intact classes were randomly assigned to two conditions: the experimental group (n = 36) and the control group (n = 36), where the experimental group received Jigsaw-based instruction and the control group received conventional teacher-centered

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instruction. The 63-item grammar achievement test was administered as a pretest and posttest and delayed achievement test, with a validation of its reliability by six specialists (split-half = 0.865; Cronbach's α = 0.839) and as an immediate academic achievement test as well as a 21-day delayed test of learning retention.

The post-test results showed a statistically significant difference in favor of the experimental group, confirming that the Jigsaw strategy improved grammatical achievement more effectively than conventional instruction. The results are consistent with the theory underlying cooperative learning and second language acquisition; that is, the results showed that the students in the experimental group achieved superior results in the achievement and retention of language according to the theories of Vygotsky (1978) and Long (1996) because of the influence of peer interaction, collaborative learning, and active engagement. The study is also in line with the literature of cooperative learning in the field of Arabic language learning, as it establishes that the Jigsaw strategy can improve the immediate and the permanent learning of the Arabic language among the non-native speakers.

Based on the findings, the use of the Jigsaw cooperative learning technique in grammar instruction in Arabic language programs is recommended to be applied to enrich students' learning in language programs. Teacher preparation programs need to equip teachers with knowledge and skills about the effective implementation of cooperative learning strategies, and institutions need to set up the environment for the implementation of cooperative learning in the classrooms.

The study was conducted with male students of a single institution, and the selected grammar topics were at the one proficiency level. As a consequence, the results of this study may not be applicable to other learners and/or teaching situations.

The effectiveness of the Jigsaw strategy could be explored in future studies with respect to individual language proficiency levels, language skills, and learning contexts. It can be further enhanced by a longitudinal and a qualitative study to establish deeper knowledge concerning the impact of this upon Arabic language learning. Lastly, the results have validated the effectiveness of the jigsaw technique in the area of teaching and learning of grammar skills to non-native learners of Arabic. The findings endorse using cooperative learning methods in teaching the Arabic language and add evidence to the educational value of cooperative learning.

FUNDING STATEMENT

This research received no external funding.

CONFLICT OF INTEREST

The author(s) declare that there is no conflict of interest related to the research, authorship, or publication of this article.

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