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The Effect of the Jigsaw Cooperative Learning Model on Improving Communication Skills of Fourth-Grade Students at Sd Inpres 2 Tondo

Nurliyan*, Abdul Rahman, Nuraini, Nashrullah, Eva Setya Rini
Elementary School Teacher Education, Tadulako University, Palu City, 94148, Indonesia

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** Corresponding author:*

E-mail: liyannur378@Gmail.Com

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A B S T R A C T

Communication skills are essential competencies that support students' academic success and social interaction in the learning process. However, field observations indicated that fourth-grade students at SD Inpres 2 Tondo showed low communication skills, particularly in expressing opinions and participating actively in classroom discussions. This study aimed to examine the effect of the Jigsaw cooperative learning model on improving students' communication skills. The research employed a quantitative approach using a quasi-experimental design with a nonequivalent control group pretest–posttest design. The participants consisted of 38 fourth-grade students divided into an experimental class and a control class. The experimental class was taught using the Jigsaw cooperative learning model, while the control class received conventional instruction. Data were collected through communication skills tests and observation sheets and analyzed using descriptive analysis, normalized gain, and independent sample t-test. The results showed that students taught using the Jigsaw model achieved higher posttest scores and better communication skill performance compared to those taught using conventional methods. These findings indicate that the Jigsaw cooperative learning model is effective in enhancing elementary school students' communication skills and can be applied as an alternative instructional strategy in language learning.

1. Introduction

Communication is a fundamental human activity that enables individuals as social beings to interact and socialize in supporting their lives. Through communication, humans can give and receive messages, information, opinions, ideas, and entertainment, thereby enabling self-development (Rahmawan et al., 2023). The forms of communication frequently used are verbal and nonverbal communication. Verbal communication is the most dominant form used by humans in interaction.

According to (Risti et al., 2025), verbal communication is communication that uses words to convey information and exchange feelings. The most common form of verbal communication is oral communication, which relies on voice as a medium, such as storytelling, discussion, conversation, and other interactive activities. Effective communication plays a significant role in determining the quality and success of the learning process. When communication runs well, the transfer of knowledge and values can proceed smoothly, whereas ineffective communication can hinder the learning process. Teachers need to equip their students with adequate communication skills. (Hidayat and Eliasa., 2024) explain that effective communication ensures that material can be understood by students, triggers positive responses, and supports the achievement of knowledge transfer. Positive communication also increases students' self-confidence while creating a conducive learning environment that fosters both academic and social development.

Communication is considered effective when it meets certain indicators, such as the use of clear and easily understood language, systematic delivery methods, and the ability to express opinions or responses orally. (Sagala and Naibaho., 2023) emphasize the importance of using clear, concise language and appropriate delivery methods to increase student engagement in learning. According to (Dewi et al.,2024), elementary school students are in the age range of 8 to 12 years. During this period, children are able to understand verbal communication because cognitively they are already thinking more logically. The learning process in schools becomes a platform for communication interaction between teachers and students. This interaction functions to develop students' communication abilities and thinking patterns in seeking information and conveying knowledge. The ability to communicate effectively in the era of globalization and information technology advancement has become a very important skill, both in personal and professional contexts. (Suleman, 2024) emphasizes that communication skills enable a person to establish good interactions with others and build strong social relationships. For students, communication skills are provisions for becoming productive members of society. However, field observations indicate that many students still face difficulties in developing communication skills, which significantly impacts their academic performance and social integration.

Based on observations conducted in the fourth-grade classroom at SD Inpres 2 Tondo, it was found that most students had not yet demonstrated courage in expressing opinions when the teacher asked questions. Students tended to remain silent, look down, or avoid the teacher's gaze when asked to provide answers. This condition became even more apparent when the teacher directly pointed to certain students, with several of them still reluctant to speak. Furthermore, when the teacher asked students to come to the front of the class to present their answers, most refused on the grounds of fear of making mistakes. This situation indicates that students' communication skills in the learning process are still low and require immediate intervention. Interview results with the fourth-grade teacher at SD Inpres 2 Tondo reinforced the observational findings. The teacher conveyed that most students lacked confidence in speaking, both when answering questions and when having to perform in front of the class. Fear of making mistakes became a factor

that caused students to choose silence over active participation. The teacher added that some students felt worried about being laughed at by their peers if they gave wrong answers. This situation has resulted in students rarely practicing speaking in front of the class, consequently preventing optimal development of their communication skills. The findings from observations and interviews demonstrate that the main problem faced by fourth-grade students at SD Inpres 2 Tondo is the fear of speaking in front of teachers and classmates. The lack of self-confidence and worry about making mistakes have prevented students from developing communication skills properly. These problems have resulted in low active participation of students in learning activities, creating a cycle of anxiety and underperformance that must be addressed through appropriate pedagogical interventions.

Previous research indicates that the implementation of cooperative learning models, particularly the Jigsaw type, can help overcome students' communication barriers and foster more active engagement in classroom activities. This model emphasizes small group collaboration, where each student is responsible for understanding certain material and then conveying it back to the original group. This process provides opportunities for students to speak, listen, and interact actively. The Jigsaw model encourages students' courage to speak, fosters self-confidence, and develops communication skills through structured peer interaction. (Adriani, 2024) found that low student speaking skills were influenced by nervousness, lack of self-confidence, and the dominance of regional languages. Similar findings were presented by (Suhartono et al., 2025), who stated that students' low speaking skills were caused by minimal practice opportunities, monotonous learning methods, and lack of motivation to express opinions.

Research by (Cahyadi et al., 2024) also confirmed that public speaking activities can train students to be more confident in speaking, thus making them braver in expressing opinions in front of teachers and peers. Appropriate learning strategies need to be employed to address the low communication skills of fourth-grade students at SD Inpres 2 Tondo. One relevant model is the Jigsaw cooperative learning approach. (Purwaningsih and Harjono 2023) explain that this model allows students to work in heterogeneous small groups, where each member is responsible for a particular portion of material; thus, students are positively interdependent to master the material comprehensively. Research by (Wirandini et al., 2024) also shows that the application of the Jigsaw model in social studies subjects increased collaboration among students by encouraging cooperation, task division, and effective communication. The Jigsaw model is capable of making students more active in learning, whether through discussion, cooperation, or interaction with group members. (Hadid, 2023) emphasizes that this model encourages students to master material through peer teaching and collaborative learning. The advantages of Jigsaw include creating an interactive classroom atmosphere, increasing creativity, communication, and critical thinking, as well as reducing learning fatigue and passive engagement. Research by (Rizki, 2019) proved that the Jigsaw cooperative learning model was effective in improving students' communication skills, with an average increase of 78.5% from the initial condition. (Handayani et

al., 2022) also demonstrated that the implementation of the Jigsaw model successfully improved understanding of science concepts, with the percentage of students who understood the material increasing to 82% compared to only 46% previously. Based on the description above, the low communication skills of fourth-grade students at SD Inpres 2 Tondo need to be addressed with appropriate learning strategies that can systematically develop students' confidence and provide authentic opportunities for communication practice. The Jigsaw cooperative learning model is considered relevant because it is capable of fostering self-confidence, encouraging courage to speak, and providing space for communication practice in a supportive and structured learning environment. Therefore, this study aims to investigate the use of the Jigsaw cooperative learning model to improve the communication skills of fourth-grade students at SD Inpres 2 Tondo.

2. Methodology

Research Design

This study employed a quantitative approach with an experimental method aimed at evaluating a treatment or intervention in educational settings on student behavior and testing hypotheses regarding the presence or absence of the treatment's effect compared to other treatments (Bau et al., 2023). The type of experiment chosen was a quasi-experiment, which is used due to limitations in controlling all variables that influence the research while still allowing researchers to provide treatment to specific groups and compare them with other groups. This approach is commonly used in educational research to test the effectiveness of a learning model, including the Jigsaw cooperative learning model, as it enables comparison of results between treatment and control groups through pretest and posttest (Kebede et al., 2025). The research design used was a nonequivalent control group design (pretest-posttest). In this design, there are two groups: the experimental group and the control group. Both groups were first given an initial test (pretest) to determine the initial condition of students' communication skills. The experimental group was then given treatment using the Jigsaw cooperative learning model, while the control group used conventional methods (lecture). After the learning process was completed, both groups were given a final test (posttest) to determine differences in learning outcomes (Priadi et al., 2022). According to (Sugiyono, 2019), this design has advantages because it is able to show the extent of the influence of the treatment given through comparison of the difference between pretest and posttest results in both groups. The research design can be seen in table 1.

Table 1. Research Design

Class	Pretest	Treatment	Posttest
Experimental Class	O_1	X_1	O_2
Control Class	O_3	X_2	O_4

Notes: X_1 (Treatment using Jigsaw cooperative learning model); X_2 (Learning using conventional method/lecture); O_1 (Initial test/pretest in experimental class); O_2 (Final test/posttest in experimental class); O_3 (Initial test/pretest in control class);

O_4 (Final test/posttest in control class). With this design, researchers can compare communication skills between students taught using the Jigsaw cooperative learning model and students taught using conventional methods at SD Inpres 2 Tondo.

Research Location and Time

This research was conducted at SD Inpres 2 Tondo, located at Jl. Dupa Indah No. 17 Palu Besusu Tengah, Palu Timur District, Palu City, Central Sulawesi, Indonesia. The research was conducted in the odd semester of the 2025/2026 academic year, specifically in September 2025.

Population, Sample, and Sampling Technique

Population refers to the entire research subjects that have characteristics relevant to the study focus and serve as the main source for generalizing research results (Suriani et al., 2023).The population in this study consisted of all fourth-grade students at SD Inpres 2 Tondo in the 2025/2026 academic year, divided into two parallel classes: Class IV A (experimental) with 19 students and Class IV B (control) with 19 students. The total population in this study was 38 students, as presented in Table 2. A sample is a representative part of the population taken for analysis purposes. This study used saturated sampling (census sampling) technique, where all members of the population were used as research samples because the number was relatively small and allowed full representation (Waruwu et al., 2025). The research sample consisted of all fourth-grade students at SD Inpres 2 Tondo divided into two parallel classes: Class IV A (experimental) with 19 students and Class IV B (control) with 19 students. Thus, the total sample of this study was 38 students. The Number of Students in Control and Experimental Classes can be illustrated in Table 2. seen in table 2

Table 2. Number of Students in Control and Experimental Classes

Class	Number of Students
Control Class	19
Ecperimental Class	19
Total	38

According to (Sugiyono, 2016), the sampling technique is a systematic method for determining research samples from a population. This study used saturated sampling or total sampling technique. This technique is a method of determining samples by involving all members of the population as research samples. This technique is chosen when the population is relatively small, less than 30 people or below 100 people, allowing all members to be used as samples (Sugiyono, 2017). states that saturated sampling is a sample determination technique when all members of the population are used as samples, conducted when the population is relatively small or researchers want to make generalizations with very small errors. adds that if the number of research subjects is less than 100, it is better to take them all so that the research is a population study. The population in this study totaled 38

fourth-grade students at SD Inpres 2 Tondo, divided into two parallel classes as follows: Class IV A (experimental) with 19 students and Class IV B (control) with 19 students. The relatively small population allowed all members of the population to be used as research samples using saturated sampling technique. The total sample in this study was 38 students.

Operational Definition of Variables and Measurement Scale

This study has two variables: independent variable (X) and dependent variable (Y). The independent variable is the Jigsaw cooperative learning model, which is a learning model that divides students into home groups and expert groups, where each member is responsible for studying a particular section of material that has been learned (Slavin, 2015). Indicators of Jigsaw model treatment according to (Sari and Utami, 2021) include: heterogeneous group division, formation of expert groups, discussion and information exchange, presentation back to home groups, and joint evaluation. The dependent variable is student communication skills, defined as students' abilities to convey and receive information effectively through oral interaction in the classroom. Indicators of communication skills according to (Dewi and Kustiarini, 2022) and (Harahap and Siregar, 2020) include: using clear and easily understood language, explaining ideas systematically, clarity of voice when speaking, showing eye contact with the audience, responding to statements from peers or teachers, and being brave in asking questions and expressing opinions. In this study, the data obtained were measured using an ordinal scale. An ordinal scale is used to perform ranking or ordering. This scale only shows that one value is greater or smaller compared to other values (Tarigan & Silaban, 2023).

Types and Sources of Data

In this study, the type of data used was quantitative data, which is data in the form of numbers obtained from communication skills test results. These data were used to determine differences in students' communication skills between experimental and control classes after being given different treatments. This aligns with research by (Waruwu et al., 2025), who explain that quantitative data is data in numerical form. The data sources used in this study were primary data and secondary data. According to primary data is data obtained directly from the original source without intermediaries. In this study, the primary data used were the results of pretest and posttest of fourth-grade students in Class IV A (experimental class) and Class IV B (control class) at SD Inpres 2 Tondo. Secondary data is data obtained indirectly. In this study, the secondary data used were data obtained from school documents, such as the number of students, attendance lists, and references from books and journals relevant to the research.

Data Collection Techniques

Data collection techniques are procedures used by researchers to obtain relevant information in answering research questions. This study used several data collection techniques including tests, observation, and documentation. Researchers used test

techniques to measure students' communication skills in Indonesian language subjects in experimental and control classes. The pretest was given before treatment to determine students' initial abilities, while the posttest was given after treatment to determine improvement in student learning outcomes. The test format consisted of essay questions. The observation technique was used by researchers to obtain complete and detailed data through observation, recording learning situations in experimental and control classes, including student involvement in classroom learning. Researchers used documentation techniques in the research to collect data obtained from the school, such as documentation with students, documentation during teaching, names and number of students, and other documents that support the research. The application of these three techniques is consistent with modern quasi-experimental research practices. (Suparwati, 2024), in research on the application of the Jigsaw model in physics learning, also used a combination of tests, observations, and documentation to obtain comprehensive data.

Research Instruments

Research instruments are tools used by researchers to collect data so that research objectives can be achieved and hypotheses can be tested. In this study, the instruments used were adjusted to the type of research data, namely quantitative data. The research instruments include communication skills test and observation sheet. The communication skills test was used as a research instrument to obtain data regarding students' abilities to convey and explain information clearly, systematically, and easily understood in Indonesian language learning. This instrument consisted of an essay test consisting of 6 questions, designed based on the material of main ideas and supporting ideas. Each question was designed to assess students' abilities to identify, explain, and re-express the main ideas and supporting ideas from a paragraph. This test was given during pretest and posttest to see the development of students' communication abilities before and after the learning process took place.

Through essay answers, students were expected to demonstrate their abilities to construct written explanations clearly and structuredly related to main ideas and supporting ideas. Scoring was done using a scoring rubric that included aspects of clarity of explanation, accuracy of content, completeness of information, and students' ability to present answers systematically. Scores obtained were then converted to a scale of 0-100 as a basis for analyzing improvement in communication abilities. The observation sheet in the form of a checklist was used to collect data on the learning process in experimental and control classes. Researchers could observe the use of learning media in the classroom. The measurement scale used was an ordinal scale with categories: 5 (very good), 4 (good), 3 (sufficient), 2 (poor), 1 (very poor). Before being used in the study, the research instruments were tested for validity and reliability to ensure that the instruments could measure what they were supposed to measure accurately and consistently. The validity test was conducted to determine whether the test items were valid and could be used to measure students' communication skills. The reliability test was conducted to determine the consistency of the instrument in

measuring the same variable. These tests were conducted on students outside the research sample but with similar characteristics to ensure that the instruments were suitable for use in data collection.

Data Analysis Techniques

Data analysis techniques in this study were conducted to answer the research problem formulation. This data analysis technique was conducted to determine differences in students' communication skills between the experimental class given treatment through the application of the Jigsaw learning model and the control class not given treatment. The data analysis techniques used in this study went through several stages including descriptive analysis, N-Gain test, prerequisite analysis tests, and parametric hypothesis testing. Descriptive analysis was used to describe the results of students' communication skills in both experimental and control classes. Data obtained from communication skills tests were analyzed by calculating measures of central tendency (mean, median, mode), measures of dispersion (standard deviation), percentage of student learning completeness, and N-Gain value (learning effectiveness). The N-Gain test was used to measure the effectiveness of learning in experimental and control classes and to see how much improvement in students' abilities based on pretest and posttest results (Gustati et al., 2025). The N-Gain criteria and formula for finding the N-Gain value are presented in Table 3. Formula: N-Gain = (Posttest Score - Pretest Score) / (Maximum Score (100) - Pretest Score)

Table 3. N-Gain Value Categories

Value	Category
$0.70 < g < 1.00$	High
$0.30 < g < 0.70$	Medium
$0.00 < g < 0.30$	Low
$G = 0.00$	No Improvement
$-1.00 < g < 0.00$	Decrease Occurred

Prerequisite analysis tests include normality test and homogeneity test. The normality test was conducted to ensure that the distribution of residual data or differences (pretest vs posttest) was normally distributed. If this assumption is met ($p > 0.05$), then parametric analysis such as t-test can be used. The homogeneity test was conducted to examine the equality of variance between groups (experimental vs control), usually through Levene's Test. If $p > 0.05$, the homogeneity assumption is met and an independent t-test can be used (Safkolam et al., 2023). Parametric hypothesis testing used independent sample t-test to examine differences in the average communication skills of students between experimental and control classes. The t-test can be used to determine whether there is a significant difference between two groups. If the sig. value < 0.05, then there is a significant effect of using the Jigsaw model on students' communication skills.

3. Results And Discussion

Classroom Conditions and Research Context

This study was conducted in two fourth-grade classes at SD Inpres 2 Tondo, Palu City, during the 2025/2026 academic year. The total number of participants involved in this research was 38 students, consisting of 19 students in the experimental class (Class IV A) and 19 students in the control class (Class IV B). The students were heterogeneous in terms of academic ability and gender composition, with both male and female students participating actively in classroom activities. Prior to the implementation of the treatment, classroom learning was generally dominated by teacher-centered instruction. Teachers mainly employed conventional learning methods, such as lecturing, question-and-answer sessions with limited student responses, and individual assignments. Under these conditions, students had minimal opportunities to express opinions, ask questions, or engage in structured discussions with peers.

Based on preliminary observations and interviews with fourth-grade teachers, students' communication skills were relatively low. Most students tended to be passive during lessons, avoided eye contact, and were reluctant to speak when asked questions. Only a small number of students consistently participated in classroom discussions, while the majority remained silent or responded briefly. These conditions were reflected in the pretest results, where most students in both the experimental and control classes did not reach the minimum mastery criterion (KKM) of 70. This situation indicated the need for an instructional model that could actively involve students and provide meaningful opportunities to practice communication skills through interaction, collaboration, and peer discussion.

Implementation of the Jigsaw Cooperative Learning Model

The implementation of the Jigsaw cooperative learning model in the experimental class began with an orientation stage. At this stage, the teacher explained the learning objectives, learning activities, and the importance of cooperation and communication during the lesson. Students were informed that each member had an important role in group success and that active participation was required. This initial explanation aimed to build students' readiness and motivation to engage in cooperative learning activities. The teacher also introduced the rules of discussion, turn-taking in speaking, and respectful listening to peers' opinions.

In the next stage, students were divided into heterogeneous home groups consisting of four to five members. Group formation was carried out by considering students' academic abilities to ensure balanced group composition. Each student in the home group received a different subtopic related to the Indonesian language learning material. This grouping strategy encouraged positive interdependence, as students realized that they needed to master their assigned material to support the learning of their group members. At this stage, students began to interact more actively with their peers, showing increased willingness to communicate within small groups.

After forming home groups, students who received the same subtopic gathered in expert groups. In these expert groups, students discussed their assigned material in depth with guidance from the teacher. Students exchanged ideas, asked questions, clarified concepts, and prepared explanations to be delivered later in their home groups. This stage played a crucial role in developing students' communication skills, as they were required to understand the material thoroughly and practice explaining ideas clearly and systematically. The expert group discussions also provided a supportive environment that reduced students' anxiety in speaking.

Once the expert group discussions were completed, students returned to their respective home groups. Each student took turns presenting and explaining the material learned in the expert group to other group members. During this stage, students actively communicated their ideas, responded to questions, and provided feedback to peers. The interaction within home groups significantly increased students' speaking opportunities compared to conventional learning. This process trained students to express ideas confidently, listen actively, and engage in meaningful dialogue during learning activities.

At the final stage of the learning process, the teacher facilitated class discussions and reflection activities. Students were encouraged to share their learning experiences, difficulties encountered, and insights gained from group discussions. The teacher provided reinforcement, clarification, and feedback on students' performance. This reflection stage strengthened students' confidence in communicating their thoughts and reinforced the importance of cooperation and communication in learning. The overall implementation of the Jigsaw cooperative learning model created an interactive and student-centered learning environment that supported the development of communication skills.

Descriptive Analysis of Pretest and Posttest Results

The descriptive analysis of pretest results showed that students' initial communication-related learning outcomes in both classes were relatively low. The experimental class obtained a mean pretest score of 56.47, while the control class obtained a mean score of 52.42. Although the experimental class showed a slightly higher initial mean score, the difference between the two classes was small, indicating comparable initial abilities. Most students in both classes did not reach the minimum mastery criterion, reflecting limited communication skills prior to the implementation of the learning model. These findings confirm that both groups started from a relatively similar baseline condition.

After the implementation of the learning treatments, the posttest results revealed a notable improvement in both classes. The experimental class achieved a mean posttest score of 72.26, while the control class achieved a mean score of 63.79. The increase in the experimental class was greater than that in the control class, indicating that students who learned through the Jigsaw cooperative learning model experienced better improvement in communication-related learning outcomes. Furthermore, the experimental class demonstrated a more consistent distribution of

scores, suggesting that the learning model contributed to more even improvement among students.

Learning Mastery and Normalized Gain Analysis

Learning mastery analysis further supported the effectiveness of the Jigsaw cooperative learning model. In the experimental class, the percentage of students achieving mastery increased from 10.5% in the pretest to 68.4% in the posttest. In contrast, the control class showed an increase from 0% to 36.8%. Although both classes experienced improvement, the experimental class demonstrated a substantially higher increase in learning mastery. This result indicates that the Jigsaw model was more effective in helping a greater number of students reach the minimum mastery criterion.

The effectiveness of the learning model was also examined using the normalized gain (N-Gain) analysis. The experimental class achieved an average N-Gain score of 0.362, which falls into the moderate category, while the control class obtained an average N-Gain score of 0.239, categorized as low. The higher N-Gain score in the experimental class indicates that the Jigsaw cooperative learning model produced greater learning improvement compared to conventional instruction. This finding suggests that structured cooperative activities provided more meaningful learning experiences that enhanced students' communication skills.

Observation Results of Students' Communication Skills

The observation results further reinforced the findings obtained from test scores. The experimental class achieved an average communication skills percentage of 81.35%, categorized as good, while the control class achieved 73.96%, categorized as fairly good. Students in the experimental class showed higher levels of participation in discussions, greater confidence in expressing opinions, and better responsiveness to peers' ideas. These behaviors were observed consistently throughout the learning process, indicating that the Jigsaw model successfully fostered active communication among students.

In contrast, students in the control class tended to rely more on teacher explanations and showed limited interaction with peers. Although some improvement was observed, communication activities were not evenly distributed among students. These results indicate that cooperative learning environments, such as those created through the Jigsaw model, provide more opportunities for students to practice communication skills in authentic learning contexts.

Hypothesis Testing and Discussion of Findings

The hypothesis testing using the Independent Sample t-test revealed a significant difference between the experimental and control classes. The test results indicated that the difference in students' communication skills was statistically significant, confirming that the Jigsaw cooperative learning model had a stronger effect than

conventional learning. This finding demonstrates that the observed improvement in the experimental class was not due to chance but resulted from the learning model applied during the study.

The findings of this study are consistent with cooperative learning theory, which emphasizes the role of social interaction in learning. Through expert group and home group discussions, students were required to actively communicate, explain concepts, and respond to peers' questions. This process aligns with constructivist and socio-cultural learning theories, which highlight the importance of interaction and collaboration in developing communication skills. Overall, the results indicate that the Jigsaw cooperative learning model provides significant benefits in improving elementary school students' communication skills and can be effectively implemented in Indonesian language learning.

4. Conclusion

This study concludes that the Jigsaw cooperative learning model is effective in improving the communication skills of fourth-grade elementary school students. The implementation of this learning model provides students with structured opportunities to actively participate in discussions, collaborate with peers, and explain learning materials within small groups. Through these activities, students are encouraged to express ideas, listen to others' opinions, and engage in meaningful interactions during the learning process. As a result, students demonstrate better communication behavior compared to those who experience conventional learning approaches.

The success of the Jigsaw cooperative learning model is closely related to its emphasis on student-centered learning and positive interdependence among group members. Each student is responsible not only for understanding the assigned material but also for communicating it clearly to peers, which fosters confidence and active participation. This learning environment supports the development of communication skills as an essential competency at the elementary school level.
Based on these findings, the Jigsaw cooperative learning model can be considered an effective alternative instructional strategy, particularly in language learning contexts. Schools and teachers are encouraged to support its implementation by providing appropriate learning conditions and guidance. Future research may focus on longer implementation periods, different educational levels, or the integration of instructional media to further strengthen and expand the application of this learning model.

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