

Implementation Of The Jigsaw Cooperative Learning Model In Increasing Elementary School Students' Learning Participation

Nurul Wahidiyatul Ma'rifah¹, Khurin In Ratnasari²

^{1,2} Universitas Al Falah Assunniyyah, Jember, Indonesia

*Email: marifahdiyah75@gmail.com

Abstract : *This study aims to describe the procedure for implementing the Jigsaw cooperative learning model to increase fourth-grade students' participation in learning. Learning participation is very important in the teaching/learning process at the elementary school level, because it shows students' active participation in the mental, emotional, and social aspects of the learning process. This study used a qualitative descriptive method to investigate the existing situation. The subjects of the study were teachers and fourth-grade elementary school students, data were collected through direct observation and in-depth interviews, as well as documentation. The data analysis process was carried out using the interactive analysis model, this model includes the stages of data collection, data condensation, data presentation, and drawing conclusions. The data were considered valid because of three different validation techniques and three different validation sources. The research findings indicate that the implementation of the Jigsaw model can increase student participation in learning, as evidenced by an increase in the number of questions asked and answers given, an increase in the number of opinions expressed, an increase in the number of groups formed, and the ability to collaborate. In addition, this model reduces the amount of power held by certain students while encouraging greater participation from all group members. The results show that the Jigsaw cooperative learning model is considered very important and useful for increasing the participation of elementary school students in learning.*

Keywords : *Cooperative learning; Jigsaw; Learning participation; Elementary school.*

INTRODUCTION

Primary education occupies a strategic position in developing the cognitive, affective, and skills foundation of students. Teaching and learning in elementary schools is not only about delivering material; it is also about engaging children more actively in their learning process (Pramesti, 2022). The level of students' mental, emotional, and social involvement during learning is shown by their participation or engagement, which is considered a key indicator of learning success (Sardiman, 2018). When students actively participate in class, it shows that they are not only receiving information; they are also contributing to the development of that information (Rusman, 2011; Uno, 2023).

Nevertheless, the reality of learning at the elementary school level often remains entrenched in the old paradigm, where the teacher is the main center of control in the

teaching and learning process (teacher-centered learning), especially through the lecture method. This model of instruction tends to make students passive, less interactive, and lacking sufficient opportunities to develop social skills or critical thinking abilities (Arends, 2012; Trianto, 2009). The lack of student involvement in classroom discussions, interest in engaging in healthy debates, and willingness to collaborate in problem-solving are all consequences of this situation.

Learning models that encourage interactive, collaborative, and student-centered classrooms are essential to address these issues. One widely recommended model is cooperative learning (Rahman, 2022). Cooperative learning is a strategy that emphasizes teamwork in small, heterogeneous groups to achieve common goals (Slavin, 2020). Johnson & Johnson (2014) assert that cooperative learning is effective in enhancing interactions, which include social interaction, strengthening personal responsibility, and active participation of students in the dynamics of learning.

The Jigsaw cooperative learning model significantly outperforms other models in terms of involving more students in the learning process (Darsan, 2023). Every student in a Jigsaw class is responsible for mastering part of the content and then conveying it back to their group. According to (Arends, 2012; Slavin, 2020) this structure encourages positive interdependence and personal responsibility by assigning each student an important role that cannot be replaced by another. According to Anita (2004) this model may encourage students to take initiative, work together, and enhance course material through collaborative effort.

Several empirical studies have shown that student engagement and performance in learning are positively influenced by the Jigsaw cooperative learning model (Wang et al., 2023). According to Huda (2014) the engagement and learning capacity of elementary school students can be significantly improved by using the Jigsaw model. Research by Widarta (2020) found that the use of the Jigsaw model in group settings resulted in higher levels of student participation in class discussions and improved teamwork. Furthermore, compared to traditional teaching methods, cooperative learning fosters a more engaging and participatory atmosphere Rusman (2011) and Trianto (2009).

Based on initial observations in fourth-grade elementary classrooms, student engagement remains low. As a result, students show little interest in class discussions, are afraid to express their opinions, and rarely collaborate to solve problems. Some students tend to be passive and only rely on more active peers. This condition indicates an imbalance in participation that needs to be addressed immediately through the implementation of more participatory learning models.

Although the Jigsaw cooperative learning model has been proven effective in a number of studies, most of these studies use quantitative approaches and focus on improving cognitive abilities (Wibowo, 2021). There is a lack of detailed descriptions of research focusing specifically on fourth-grade students and how they use the Jigsaw

model to incorporate student participation into their learning through observations and interviews. As a result, elementary schools need to conduct extensive research on the Jigsaw cooperative learning model and the various ways students are involved in their education.

The purpose of this research is to determine how well the Jigsaw cooperative learning model encourages student engagement during class. In addition, this study aims to characterize the various ways students actively participate in their own learning through the use of observation and interview data.

This research discusses the implementation of the Jigsaw cooperative learning model in fourth-grade elementary classrooms, particularly focusing on observed participation. This study also examines the various ways students learn as a result of this model and, ultimately, uses interview and observation data to evaluate the effectiveness of the model.

This research is expected to contribute to both theoretical and practical domains. It aims to expand the understanding of how to integrate the Jigsaw cooperative learning model into elementary schools. The research will primarily rely on observations and interviews to achieve these objectives. The practical implications of this study include helping educators select and implement advanced learning models that engage students more deeply and providing data to schools to inform efforts to improve the quality of education provided.

METHOD

This research employs a descriptive design and qualitative methodology. The selection of this method is based on its application to the study of active engagement of fourth-grade students in the learning process and its relevance to a deeper understanding of the implementation of the Jigsaw cooperative learning model. Qualitative research emphasizes the meaning of social phenomena from the perspective of the research subjects, focusing on processes, interactions, and learning contexts rather than hypothesis testing or statistical generalization (Creswell & Poth, 2018; Moleong, 2019).

According to Sugiyono (2019), the descriptive approach is used to provide an integrated and unbiased picture of the phenomena or events being investigated, the application of the Jigsaw cooperative learning model, and student engagement in the learning process. The elementary school employing this method served as the research location. The selection of the research site was carried out purposively, as the school was deemed relevant to the research focus and still exhibited issues related to the learning participation of fourth-grade students. The study was conducted during the even semester of the current academic year so that the learning process could be observed under normal conditions.

This research involved fourth-grade teachers and students as subjects. Teachers served as the main sources of information regarding the planning, implementation, and assessment processes, while students were the primary focus in observing the level of learning participation. The research focused on the process of implementing the Jigsaw model and the forms of student participation, such as actively asking and answering questions, the courage to express opinions, involvement in group discussions, and the ability to cooperate among students. These indicators refer to the concept of learning participation as the active involvement of students mentally, emotionally, and socially in the learning process (Sardiman, 2018; Uno, 2023).

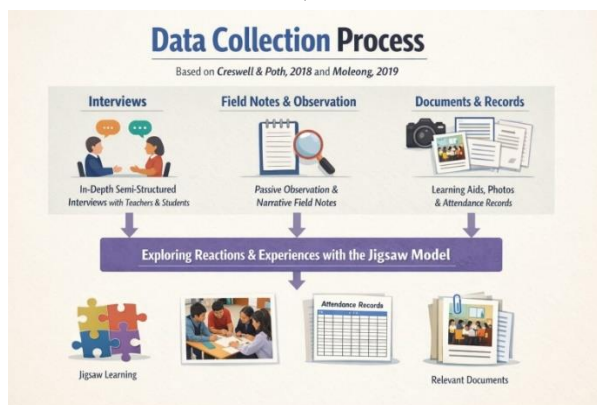


Figure 1. Data Collection Process

Interviews, written documentation, and observation were used as data collection methods. According to (Creswell & Poth, 2018) the dynamics of learning are described narratively through field notes and observation guides, which are used for passive observation. Teachers and students were interviewed using in-depth semi-structured interviews to collect data regarding their reactions and experiences with the Jigsaw model. (Moleong, 2019). Learning aids, student attendance records, pictures of the learning process, and other relevant documents were used to enrich the data. (Creswell & Poth, 2018).

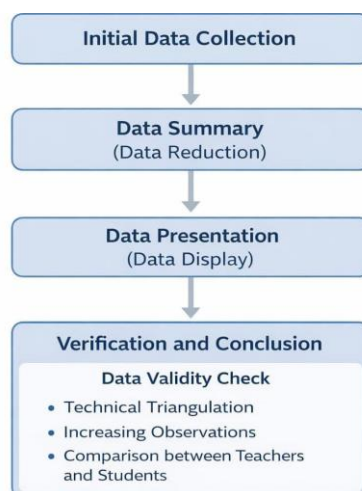


Figure 2. Data Analysis

Data analysis was carried out according to the interactive analysis model proposed by (Miles et al., 2018). This model includes initial data collection, followed by condensation, presentation, and verification. Technical triangulation, increasing the number of observations, comparisons between teachers and students, and cross-checking data with other sources all contributed to maintaining data validity (Moleong, 2019; Sugiyono, 2019).

RESULT AND DISCUSSION

Planning the Implementation of the Jigsaw Cooperative Learning Model

Planning is an essential stage that forms the foundation for the successful implementation of the Jigsaw cooperative learning model. This stage is developed through a review of the initial learning conditions in fourth grade and a needs analysis as a strategic effort to increase student participation. The planning process is carried out systematically through several steps: identifying learning problems, determining the appropriate learning model, preparing learning tools, designing group formation, outlining the steps for lesson implementation, and designing the evaluation system.

According to interviews with fourth-grade educators, the Jigsaw model replaced more traditional teaching methods such as lectures and small group work, resulting in varied student engagement in the classroom. Some students were shy and lacked the confidence to speak during class discussions, while others were more articulate and had a stronger academic background.

Identification of initial conditions revealed several problems in the learning process. These included uneven student participation, dominance of a few students in discussions, low individual responsibility in group work, lack of student courage in expressing opinions, and learning interactions that did not yet reflect optimal collaboration. These findings formed the basis for selecting a learning model capable of fostering positive interdependence among students, increasing individual responsibility, and promoting equitable participation.

The Jigsaw cooperative learning model was chosen by teachers as the most suitable approach in light of current issues. The characteristics of this model were considered most appropriate for students' educational needs. Each student is responsible for a specific part of the material, there is a clear division of roles within the group, and the model encourages interaction and cooperation among students. Additionally, the Jigsaw model minimizes individual dominance within groups and requires the active involvement of all members. The structure of Jigsaw learning enables students to learn actively through discussions in both expert and home groups.

Learning objectives were developed by teachers during lesson planning with an emphasis on content mastery and student engagement. The objectives were designed so that students would understand the material according to their respective responsibilities, be able to explain the material to home group members, demonstrate good cooperation,

actively participate in discussions, and take responsibility for individual and group tasks. The formulation of these objectives aligns with the research focus on increasing participation through cooperation, activeness, and student responsibility.

The indicators that show the jigsaw learning model can increase student participation are as follows:

In this study, to measure the increase in students' learning participation, the researcher used the jigsaw theory from (Aronson et al., 1978). Each student is responsible for different material, which encourages students to actively participate in discussions, convey information to their group, and ask questions to their peers. This can be observed through student participation observation instruments, such as involvement in discussions, the ability to explain material, and cooperation within the group.

Implementation of the Jigsaw Cooperative Learning Model

Jigsaw, a cooperative learning model, was planned for use with fourth-grade students in elementary school. The learning stages were organized according to the Jigsaw model syntax. While the teacher provided guidance, students took the lead in completing learning tasks. This educational implementation aimed to enhance student participation by promoting cooperation, active participation, and individual responsibility within the group.



Figure 3. Preliminary Stage

During the preliminary stage, the teacher began the lesson with opening activities such as greetings, prayers, and an introduction to connect the lesson with students' prior knowledge. The teacher then outlined the steps involved in implementing the Jigsaw model in class, including how students would be grouped according to strengths and areas of expertise, how material would be distributed, and what roles each group member would play. This explanation was intended to clarify students' understanding of the learning process and ensure their successful participation.



Figure 4. Group Division

After the introductory material, the class was divided into small groups of four or five students. When forming groups, the teacher considered students' diverse interests, abilities, and personalities. At this stage, each group member was assigned a different part of the material, requiring individual responsibility. Observations showed that students accepted group assignments well and began to adjust to their group members.

Students focusing on the same curriculum area then worked together to form expert groups. At this stage, students learned the subject matter in depth by reading, discussing, asking questions, and planning how to present it to their target audience. The teacher assisted students facing difficulties and motivated those less involved to participate in group activities and discussions. Because they would be explaining the content to their classmates, most students, according to observations, were genuinely motivated to learn it.

Once expert groups completed their tasks, students returned to their home groups to share what they had learned. At this stage in the Jigsaw model, each student acted as a resource for their classmates. This process encouraged two-way interaction, fostered mutual respect for opinions, and strengthened individual responsibility and positive interdependence among group members. Based on observations, most groups were able to conduct discussions well. Students were actively asking questions, responding, and helping peers who faced difficulties. However, some groups still had members who did not participate optimally, so the teacher provided additional guidance to ensure more balanced discussions.



Figure 5. Group Discussion

Each group was given the opportunity to present their results after all discussion sessions were completed. This activity aimed to reinforce students' understanding and prevent misconceptions. The teacher then provided clarification, emphasized the key material, and summarized the lesson. Observation findings indicated increased student activity and interaction during lessons, in contrast to the previous lecture-oriented approach.

As students progressed in the learning process, the teacher's role evolved from an authoritative source to a facilitator and mentor. The teacher's responsibilities included leading discussions, providing positive reinforcement, assisting students experiencing difficulties, managing classroom time, and maintaining a cheerful atmosphere. Even the quietest students gained confidence to express their opinions.

Observations of five groups showed that most groups were rated good to very good in terms of cooperation, member activeness, and the quality of discussion results. Some groups demonstrated very solid teamwork with active involvement from all members, while others still had students who did not participate to the fullest.

Overall, students were more engaged in class discussions, had less dominance, were encouraged to take responsibility, learned in a more interactive environment, and worked together more effectively since the introduction of the Jigsaw cooperative learning model. According to implementation results, fourth-grade students benefited from the Jigsaw model. Everything went according to plan in terms of learning, but more work remains to ensure that every student can participate and manage their time well.

Evaluation of the Implementation of the Jigsaw Cooperative Learning Model

To determine how well fourth-grade students were able to cooperate during the learning process, researchers observed the practice of the Jigsaw cooperative learning model in the classroom. Observation of the learning process and interviews with fourth-grade teachers were the two main sources of data used in this evaluation. The evaluation focused on three main areas: student engagement, group work, and the quality of discussions.

Most of the five study groups showed very good to excellent performance in group discussions, member participation, and cooperation, according to observations. The results

indicated that, compared to other teaching methods, the Jigsaw model encouraged greater engagement and participation in class. In terms of cooperation, most groups were much more effective. Everyone in the group contributed to understanding and sharing knowledge with one another. Because each student was responsible for a different part of the material, a sense of positive interdependence among group members began to develop. However, some groups still showed differences in participation levels, with some students being more active than others, so equal involvement still needs improvement.

In terms of student engagement, observations revealed that both expert and home groups had much higher participation levels during group discussions. When asked to share ideas and explain material to classmates, some students appeared more confident. Nevertheless, not all students felt completely comfortable engaging in active participation.

In terms of discussion results, generally students were able to demonstrate adequate understanding of the material. Groups with high levels of cooperation and activeness tended to produce more systematic and in-depth discussions. Conversely, groups with less balanced participation were still able to complete discussions, but the quality of their discussions still needs improvement. This shows that the quality of discussion results is strongly influenced by the level of participation and collaboration among group members.

Interview results with fourth-grade teachers supported the observational findings. Teachers stated that before implementing the Jigsaw model, classroom activity tended to be dominated by students with higher academic abilities, while others were less engaged. After the model was implemented, teachers found that students became more responsible for the material they learned, their courage in expressing opinions increased, interactions among students became more dynamic, and the classroom environment became more active and participatory. Teachers also noted that the Jigsaw model was able to reduce the dominance of certain students because each student had a role that could not be replaced by other group member.

Despite its positive impact, teachers reported that time management in learning still needs improvement to ensure that all stages of the Jigsaw model can be carried out optimally. In addition, teachers need to provide more intensive guidance to less active students to achieve more even participation.

Based on observations and interviews, the learning objectives formulated during the planning phase were generally achieved. Increased student participation was evident from greater cooperation among students, increased activeness in group discussions, increased individual responsibility for tasks, and increased student confidence in expressing opinions. Although not all students showed the same level of participation, there was an overall significant improvement compared to before the Jigsaw model was implemented.

Overall, the Jigsaw cooperative learning model proved effective in building cooperation and strengthening interactions among students, reducing the dominance of

certain students in discussions, fostering individual responsibility in learning, and creating a more active and collaborative learning environment. Nevertheless, its implementation still has some limitations, such as less than optimal equal activeness among students, time management that needs improvement, and the need for more intensive teacher supervision and guidance during the learning process.

DISCUSSION

A. Planning for the Implementation of the Jigsaw Cooperative Learning Model

The planning stage for the implementation of the Jigsaw cooperative learning model serves as the main foundation for the success of the learning process (Rahayu, 2021). Based on research findings, the planning process is conducted through the identification of initial learning conditions, analysis of student needs, and the determination of relevant learning strategies to improve participation. The results show that before implementing the Jigsaw model, learning was still dominated by lecture methods and simple discussions, resulting in uneven student participation (Mundo et al., 2024). This condition indicates the need for a learning model that fosters individual responsibility and collaborative interaction among students (Harefa et al., 2022).

These findings are in line with the cooperative learning theory put forward by Slavin (2020), who stated that the achievement of cooperative learning is closely related to a systematically and purposefully structured learning environment. Careful planning through the establishment of learning objectives, the preparation of learning tools, and the creation of heterogeneous groups has proven to foster more optimal readiness for learning (Arifin, 2024).

In addition, the research findings expand upon the cooperative learning concept Anita (2004) who stated that the achievement of cooperative learning is closely related to a systematically and purposefully structured learning environment. Careful planning through the establishment of learning objectives, the preparation of learning tools, and the creation of heterogeneous groups has proven to foster more optimal readiness for learning (Ismail et al., 2025).

Theoretically, this study contributes to strengthening the understanding that cooperative learning planning should be based on student needs analysis and learning conditions (Kafiar et al., 2023). Practically, this research demonstrates that teachers need to conduct structured lesson planning so the Jigsaw model can be implemented effectively (Atika & Aulia, 2025).

The novelty of this research lies in its planning strategy that combines student needs analysis based on empirical field data, such as initial participation survey results, with the formation of heterogeneous groups that consider students' psychological factors, including confidence levels and learning preferences (C. Hidayat & Mulyanti, 2020). Unlike previous research that was more theory-oriented, this study offers practical contributions to improving

learning readiness in middle schools with a high diversity of student characteristics. Furthermore, the innovation of this research is also evident in the use of a simple predictive model to estimate the effectiveness of group formation based on initial data, which is still rarely explored in the cooperative learning literature (Jayanti et al., 2025).

B. Implementation of the Jigsaw Cooperative Learning Model

According to the implementation of the Jigsaw cooperative learning model in this research, students were more likely to participate actively in the learning process when they were regarded as the main participants. Simbolon (2024), notes that students became more engaged in group discussions, worked together more effectively, and took greater responsibility for their own learning.

These results are consistent with Vygotsky's social constructivism theory, which emphasizes that learning begins with social interaction (Puspita et al., 2024). Student knowledge can be shared through the formation of expert groups and home groups. This method enhances communication and teamwork skills while making content easier to understand. (SALSABILA, 2024).

These findings align with previous research indicating that the Jigsaw model successfully increases student engagement in learning (Djabba, 2020). When lessons are structured in groups, students are more actively engaged in what they learn. However, some students still need support to improve their understanding of participation, as also indicated by this research.

Theoretically, this study reinforces the concept that cooperative learning can create meaningful learning through social interaction. Practically, the findings suggest that teachers must act as facilitators who can guide discussions and provide support to less active students (Tara & Firdaus, 2025).

The novelty of this research lies in the implementation of the Jigsaw model combined with basic gamification elements, such as awarding points for active participation in both expert and home groups. This approach was proven to increase the involvement of students who are psychologically more passive (Adolph, 2016). Moreover, this research introduces the measurement of student participation through real-time social interaction analysis using video recordings, thus providing a more comprehensive picture of collaborative dynamics compared to conventional observation methods (Sumiati, 2009).

C. Evaluation of the Implementation of the Jigsaw Cooperative Learning Model

The results of using the Jigsaw teaching model show that it increases standards of student engagement, group work, and discussion quality. According to interviews and observations, students took a more active role in their own education and felt more comfortable voicing their opinions and preferences (Hertiavi et al., 2010).

These findings reinforce Slavin (2020), that student motivation can be increased through cooperative learning by promoting positive interdependence and individual

accountability. The results also support previous studies showing that the Jigsaw method successfully engages all students.

However, this research found that it is difficult to achieve proportional student participation. Thus, the effectiveness of the Jigsaw method depends on students' psychological elements and the teacher's ability to motivate and guide them (Tara & Firdaus, 2025).

This research supports the idea that cooperative learning can increase student participation, at least in theory. More practically, it means that educators must make the best use of class time and provide extra support to students who do not actively participate (WH et al., 2023).

This study offers novelty through holistic learning evaluation by integrating quantitative data in the form of student participation scores with qualitative analysis of psychological factors such as intrinsic motivation and emotional barriers (T. Hidayat, 2023). The evaluation was carried out through data triangulation involving observation, interviews, and post-learning surveys. Additionally, this research developed a participation evaluation rubric tailored to the local cultural context, enabling a fairer and more contextual distribution of student participation (Wulandari, 2024).

CONCLUSION

Based on research findings reviewed from the aspects of planning, implementation, and evaluation, it can be stated that the implementation of the Jigsaw cooperative learning model for fourth-grade elementary students was systematically organized and had a positive impact on increasing learning participation. Teachers considered students' background knowledge and learning needs when developing lesson plans. The steps involved in this process included identifying needs, forming groups, developing resources (such as worksheets and materials), and planning the learning stages based on Jigsaw syntax.

Each part of the Jigsaw process was carried out according to plan during the execution phase. The process began with the formation of initial groups, followed by expert group discussions, and concluded with presenting results to the original groups. Students took the lead, and the learning process became more interactive. Student involvement increased as they became more comfortable collaborating, contributing to class discussions, taking ownership of their learning, and expressing themselves confidently.

Additionally, interviews and observations conducted during the evaluation process showed that the Jigsaw model effectively increased participation, especially in areas such as individual responsibility, active participation, and cooperation. Although there are still areas for improvement in time management and equal participation, the model succeeded in reducing the dominance of certain students and fostering a more cooperative learning atmosphere overall. It can be concluded that the Jigsaw cooperative learning model has gained considerable recognition as a powerful tool for engaging

elementary school students in the learning process.

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BIBLIOGRAPHY

- Adolph, R. (2016). *Pemikiran Gillies*.
- Anita, L. (2004). *Cooperative learning: Mempraktikkan cooperative learning di ruang-ruang kelas*. Jakarta: PT. Gransindo.
- Arends, R. I. (2012). *Learning to Teach*. McGraw-Hill.
- Arifin, B., Salim, A. N., Muzakki, A., Suwarsito, S., & Arifudin, O. (2024). Integrasi penguatan pendidikan karakter dalam pembelajaran berbasis literasi digital pada peserta didik sekolah dasar. *Innovative: Journal Of Social Science Research*, 4(3), 13547-13555.
- Aronson, E., Blaney, N., Stephan, C., Sikes, J., & Snapp, M. (1978). *The Jigsaw Classroom*. Sage Publications.
- Atika, M., & Aulia, N. (2025). Penerapan model pembelajaran kooperatif tipe jigsaw untuk meningkatkan motivasi belajar siswa pada kelas iv sekolah dasar negeri 1 supat kecamatan babat supat. *Edu Society: Jurnal Pendidikan, Ilmu Sosial dan Pengabdian Kepada Masyarakat*, 5(1), 839-853.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches (4th ed.)*. Sage publications. https://books.google.co.id/books?hl=id&lr=&id=DLbBDQAAQBAJ&oi=fnd&pg=PP1&ots=-is837LTOy&sig=R41UvMb-7PcKtQXzNFilaBPejK4&redir_esc=y#v=onepage&q=open%20ended&f=false
- Darsan. (2023). Improving student interest and learning outcomes with the jigsaw cooperative learning model. *Journal of Education Technology and Innovation*.
- Harefa, D., Sarumaha, M., Fau, A., Telaumbanua, T., Hulu, F., Telambanua, K., ... & Ndraha, L. D. M. (2022). Penggunaan model pembelajaran kooperatif tipe jigsaw terhadap kemampuan pemahaman konsep belajar siswa. *Aksara: Jurnal Ilmu Pendidikan Nonformal*, 8(1), 325-332. <https://doi.org/10.37905/aksara.8.1.325-332.2022>
- Hertiavi, M. A., Langlang, H., & Khanafiyah, S. (2010). Penerapan model pembelajaran kooperatif tipe jigsaw untuk peningkatan kemampuan pemecahan masalah siswa Smp. *Jurnal Pendidikan Fisika Indonesia*, 6(1), 53-57. <https://doi.org/10.15294/jpfi.v6i1.1104>
- Hidayat, C. (2023). *Inovasi Pendidikan Agama Islam*. Bandung: CV Kimfa Mandiri.

- Hidayat, T. (2023). Model pembelajaran jigsaw dalam meningkatkan hasil belajar tematik siswa SD. *Jurnal Pendidikan Dasar Indonesia*.
- Huda, M. (2014). Model-model pembelajaran: isu-isu metodis dan paradigmatik. *Yogyakarta: Alfabeta*.
- Ismail, H., Bouty, A. A., Ashari, S. A., Hadjaratie, L., Suhada, S., & Muthia, M. (2025). Model cooperative learning menggunakan teknik jigsaw untuk meningkatkan pemahaman siswa. *Inverted: Journal of Information Technology Education*, 5(2), 184-193.
- Jayanti, A. D., Safitri, M. C., . Y., & . K. (2025). Analisis kritis pemikiran thorndike, skinner, dan ausubel sebagai landasan teoritis pembelajaran matematik. *Jurnal Ilmiah Matematika (JIMAT)*, 6(2), 681-699. <https://doi.org/10.63976/jimat.v6i2.1078>
- Johnson, D. W., & Johnson, R. T. (2014). Cooperative Learning in 21st Century. [Aprendizaje cooperativo en el siglo XXI]. *Anales de Psicología*, 30(3). <https://doi.org/10.6018/analesps.30.3.201241>
- Kafiar, D. Y. B., Sormin, S. A., & Betaubun, S. L. (2023). Penerapan Model Pembelajaran Jigsaw untuk Meningkatkan Kemampuan Berpikir Kritis Siswa Kelas II Sekolah Dasar. *Journal of Education Action Research*, 7(3), 336-343
- Miles, M. B., Huberman, A. M., & Saldana, J. (2018). *Qualitative Data Analysis: A Methods Sourcebook*. SAGE Publications. <https://books.google.co.id/books?id=fjh2DwAAQBAJ>
- Moleong, L. J. (2019). *Metodologi penelitian kualitatif edisi revisi*. Remaja Rosdakarya.
- Marni, M., Teko, A., & Novalia, L. (2024). Peran pembelajaran kooperatif dalam meningkatkan hasil belajar dan partisipasi aktif siswa di dalam kelas. *Coram Mundo: Jurnal Teologi Dan Pendidikan Agama Kristen*, 6(2), 270-281.
- Pramesti, N. (2022). Model group investigation untuk meningkatkan kemampuan berpikir kritis siswa sekolah dasar. *Jurnal Basicedu*.
- Puspita, A. T., Herdiana, D., & Nurfurqon, F. F. (2024). The use of jigsaw type cooperative learning model to improve cooperation skills in primary school students. *Journal of Educational Experts*.
- Rahayu, S. (2021). Cooperative Learning Tipe Jigsaw pada Pembelajaran Matematika SD. *Jurnal Pendidikan Matematika*.
- Rizkasari, E., Rahman, I. H., Aji, P. T., Slamet, U., Surakarta, R., & Purwokerto, U. M. (2022). Penerapan model pembelajaran project based learning untuk meningkatkan hasil belajar dan kreativitas peserta didik. *Jurnal Pendidikan Tambusai*, 6(2), 14514-14520.
- Rusman. (2011). *Model-model pembelajaran: Mengembangkan profesionalisme guru*. Rajawali Pers/PT Raja Grafindo Persada.
- Sardiman, A. M. (2018). *Interaksi dan Motivasi Belajar-Mengajar*. RajawaliPers.
- Slavin, R. E. (2020). *Cooperative Learning, Teori Riset dan Praktik*. Nusamedia.
- Sugiyono. (2019). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. CV. Alfabeta.
- Tara, L., & Firdaus, F. M. (2024). The impact of the jigsaw cooperative learning model on creative thinking and collaboration in fifth-grade natural and social sciences. *Jurnal Penelitian Ilmu Pendidikan*, 17(2), 107-114.
- Tara, L., & Firdaus, F. M. (2024). The impact of the jigsaw cooperative learning model on creative thinking and collaboration in fifth-grade natural and social sciences. *Jurnal Penelitian Ilmu Pendidikan*, 17(2), 107-114.
- Trianto, T. (2009). *Mendesain model pembelajaran inovatif-progresif*. Jakarta: Kencana.
- Uno, H. B. (2023). *Teori motivasi dan pengukurannya: Analisis di bidang pendidikan*. Bumi Aksara.
- Wang, M., Alavi, M., & Izadpanah, S. (2023). The impact of jigsaw cooperative learning on academic motivation, academic hardiness, and self-efficacy of English Foreign Language learners. *Learning and Motivation*, 84, 101940. <https://doi.org/10.1016/j.lmot.2023.101940>

- WH, E. H., Safitri, D. O., Saputro, B. P., Munawaroh, L. F., Umamah, I., & Putri, R. A. (2023). Manajemen Kelas Pembelajaran Cooperative Berbasis E-learning. *Webinar Biofair Pendidikan Biologi Universitas PGRI Semarang*, 252–266.
- Widarta, G. M. A. (2020). Penerapan model pembelajaran kooperatif tipe jigsaw untuk meningkatkan motivasi dan hasil belajar. *Indonesian Journal of Educational Development (IJED)*, 1(2), 131–141.