



Improving Learning Outcomes Using Jigsaw Learning in High Class Elementary Schools

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ABSTRACT

Purpose of the study: This research addresses the challenge of low student learning outcomes and limited group learning engagement. Specifically, it seeks to enhance students' thematic learning outcomes by implementing the Jigsaw learning model.

Methodology: The study employs a classroom action research design conducted over three cycles. The subjects of this research were 34 students from class VI.B at Elementary School 25 Palembang. Data collection techniques included observation, tests, and documentation to gather comprehensive student performance and engagement insights.

Main Findings: The research findings indicate a significant improvement in student learning outcomes due to applying the Jigsaw learning model. The thematic learning outcomes for theme 1, subtheme 2, showed a marked increase across the three cycles: from 53% in cycle I to 65% in cycle II and 88% in cycle III. This progression highlights the model's effectiveness in fostering better academic performance and active participation among students.

Novelty/Originality of this study: The novelty of this research lies in its application of the Jigsaw learning model within the context of thematic learning, which is relatively underexplored in primary education. The study enhances cognitive outcomes and promotes social skills and collaborative learning by integrating cooperative learning strategies that emphasize student interdependence and accountability. This innovative approach demonstrates the potential of the Jigsaw model to transform traditional classroom dynamics, making learning more interactive, inclusive, and effective. Thus, the study provides valuable insights and practical implications for educators seeking to improve student engagement and achievement through collaborative learning models.

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1. INTRODUCTION

Learning is a process of interaction that occurs between educators and students to achieve certain goals [1]-[3]. According to Al-Tabany [4] Learning is a conscious effort by a teacher to teach students (directing student interaction with other learning resources) in order to achieve the expected goals. One of them is learning mathematics. The objectives of mathematics learning are stated in the Republic of Indonesia Minister of National Education Regulation No. 19 of 2005 is that students have the ability to understand mathematical

concepts and solve problems which includes the ability to understand problems, design mathematical models, solve and interpret the solutions obtained.

Education in Law number 21 of 2003 is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have the strength of spiritual religion, self-control, intelligent personality, noble morals, as well as the skills and abilities required. the need for himself, society, nation and state. National education functions to develop abilities and shape the character and civilization of the nation which threatens to educate the nation's life, aims to develop the potential of students to become human beings who have faith and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable of being creative, independent and become democratic and responsible citizens [1].

Education is also an activity that has a specific aim or objective which is directed at developing the potential that humans have both as humans and as a society to the fullest [2]. Education at school has the aim of changing students so that they can have knowledge, skills and attitudes as a form of learning behavior. Changes to this are usually carried out by teachers using several methods and practical activities to support teaching and learning process activities [3].

In the learning process, students can be said to be learning if they experience a change in themselves from not knowing to knowing or there is an improvement to become better both cognitively, affectively and psychomotorically. This is related to the implementation of the 2013 Curriculum which is expected to produce productive, creative, innovative and affective human resources, through strengthening attitudes, knowledge and skills competencies [4]. In the 2013 Curriculum, learning activities use an integrated thematic approach that links several themes. The thematic approach is a form of learning strategy that uses themes by creating active, interesting and meaningful learning [5].

Integrated thematic learning is learning that deliberately links several aspects both within subjects and between subjects, with this integration students will gain complete knowledge and skills so that learning becomes meaningful for students [6]. Integrated thematic learning is integrated learning that uses themes to link several subjects, so that it can provide useful experiences to students. It is said to be useful because integrated thematic learning will enable students to understand the material or concepts they are studying through direct experience and relate it to the material they understand [7]. The integrated learning process makes the learning process more effective, by creating opportunities for students to build interrelated concepts [8]. Thus, integrated thematic learning provides opportunities for participants to develop three domains of educational objectives simultaneously in the areas of attitudes, knowledge and skills. Enables students to integrate information and topics in various learning experiences [9].

The teacher plays the main role in helping students in the learning process so that they can realize learning that is able to bring change to individual students. An interesting learning process that provides direct impressions and experiences that adapt to students' needs will influence maximum learning outcomes. Learning outcomes are an important part of learning activities, learning outcomes are statements about what students are expected to know, understand and be able to demonstrate after completion of the learning process [10]. Learning outcomes are changes that occur within a person due to the learning process they undertake [11].

Learning outcomes are a final assessment of a process and introduction that has been carried out repeatedly. And it will be stored for a long period of time or even will not be lost forever because the learning results participate in forming an individual who always wants to achieve better results so that it will change the way of thinking and produce better work behavior [12]. Learning outcomes are consistent assessments carried out by educators at the end of the teaching process [13]. Students' understanding and learning outcomes really depend on a teacher because teachers have a significant influence on the teaching and learning process in the classroom. So that in learning, choosing the right learning model will help students become more involved and develop character and social skills [14]. In order to achieve learning outcomes that provide changes in students both in terms of knowledge, attitudes and skills, learning is required that involves students directly using learning models. One learning model that is considered effective in its implementation is the Jigsaw learning model.

This jigsaw learning model can be used in integrated thematic learning, because integrated thematic learning has the characteristics of meaningful learning, and places children as the main actors in the learning process [15]. Learning by applying the jigsaw model can increase students' learning independence so that learning becomes more varied and not monotonous [16]. The Jigsaw learning model is a type of learning carried out in groups, where the group consists of several students who are responsible for mastering part of the teaching material and then have to teach the material that has been mastered to their group friends [17].

The jigsaw learning model is a teaching and learning process that can foster student responsibility so that they are directly and actively involved in understanding a problem and solving it as a group [18]. The Jigsaw learning model is a learning model that emphasizes heterogeneous group learning activities and each member involved in the group will involve themselves as members of the home group and members of the expert group [19]. The home group in this case is the initial group of students whose members include an expert group which was formed by paying attention to the differences and backgrounds of students in the group [20]. Meanwhile,

what is meant by an expert group is a group of students whose members include other groups who are given the task of studying certain topics and materials which must then be explained to the members of their original group. These groups from different origins meet to discuss the same topic or material in expert groups to exchange ideas and study the material given to each group member and work together, helping each other to discuss the problems they face [21].

The Jigsaw type cooperative learning model is essentially a student-centered learning model. Students have a big role and responsibility in learning, teachers only act as facilitators and motivators. The aim of the Jigsaw type cooperative learning model is to develop teamwork, cooperative learning skills and mastery of in-depth knowledge that students cannot obtain if students study the material individually [22]. Cooperative learning is a learning model that involves more active interaction between students and students, students and teachers and students and their learning environment. Students study together and ensure that each group member has truly mastered the material being studied. The advantage that can be obtained from implementing cooperative learning is that students can achieve good learning results because cooperative learning can increase students' learning motivation which is one of the factors that influence learning outcomes [23].

Based on the results of observations carried out in class VI.B of Elementary School 25 Palembang, researchers found several problems, namely that students were less active in completing the assignments given by the teacher, only some groups were dominant in completing them, so it was seen that some members were irresponsible in the group. Students still do not have the courage and confidence to appear in front of the class and the learning outcomes of class VI.B students are still low in thematic subjects. Thus, the aim of this research is to improve thematic learning outcomes for theme 1 subtheme 2 through the Jigsaw learning model in class VI.B of Elementary School 25 Palembang for the 2023/2024 academic year.

2. RESEARCH METHOD

The research method used in this research is classroom action research. Classroom action research is an action carried out by the teacher/performer, starting from planning to assessing real actions in the classroom in the form of teaching and learning activities to improve the learning conditions carried out [24]. This classroom action research was carried out at Elementary School 25 Palembang which was carried out in class VI.B in thematic subject Theme 1 "Save Living Creatures" Subtheme 2 "My Friend Animals". The subjects in this classroom action research were students in class VI.B of Elementary School 25 Palembang, totaling 34 students, consisting of 19 male students and 15 female students. Learning in class is still stated to be less than optimal, where the learning outcomes obtained from the pre-cycle have not yet fully reached the specified minimum completeness criteria (KKM). This research method uses classroom action research which is carried out in three cycles with 1 meeting in each cycle and collaborating with tutor teachers. This classroom action research was carried out in a cyclical process consisting of four stages, planning, action, observation/evaluation, and reflection [25].

Data collection techniques are techniques used in research to collect data. Data collection techniques used in this research were observation, tests and documentation. Observation is defined as systematically observing and recording the symptoms seen in the object under study. Written tests are systematic procedures created in the form of written assignments given to students to complete. This test includes an evaluation question sheet. Documentation is a data collection technique that is not shown directly to the research subject, but rather through documents. Data was obtained through documents in the form of photos of learning activities [26].

The data analysis techniques used in this research are qualitative and quantitative data [27]. Qualitative data is data obtained from student observations during data collection obtained from the researcher's actions. Quantitative data is data obtained from test results given to students in the form of evaluation questions [28]. Classroom action research is successful if the completeness of student learning outcomes is categorized as 85% of the total number of students achieving the KKM score determined by the school, namely ≥ 75 in thematic subjects, through improving thematic learning outcomes for theme 1 subtheme 2 using the Jigsaw learning model for students class VI.B Elementary School 25 Palembang. For quantitative analysis of data obtained from test results using classical calculations and completeness for each student as follows [29]:

Student (individual) Completeness Value:

$$\text{Student Values} = \frac{\text{Total Score}}{\text{Maximum Score}} \times 100\% \dots (1)$$

Classical Completeness Value:

$$\text{Total Score} = \frac{\text{Number of Completed Students}}{\text{Number of All Students}} \times 100\% \dots (2)$$

3. RESULTS AND DISCUSSION

This classroom action research was conducted at State Primary School No 13/1 Muara Bulian. The researcher asked permission from the principal of State Primary School No 13/1 Muara Bulian to conduct research at the school. He also gave permission and asked to meet the homeroom teacher in the class he wanted to research to discuss the research schedule. During the meeting, the researcher conveyed the aim of the research to be carried out, namely improving mathematical problem solving abilities in spatial construction material.

Based on the results of classroom action research which was carried out in 3 cycles in class VI.B of SD Elementary School 25 Palembang with a total of 34 students. This research uses the Jigsaw learning model to improve student learning outcomes for theme 1 subtheme 2. This research was conducted referring to the research model developed by Kemmis and Mc. Tanggart by starting several stages, namely planning, implementing actions, observing and reflecting [30]. Before conducting classroom action research, the researcher first carried out pre-cycle activities to determine student learning outcomes before implementing the Jigsaw learning model. The pre-cycle results are as follows.

Table 1. Pre-Cycle Results

Pre Cycle Results		Mark
Complete	16	47%
Not Completed	18	53%
Amount	34	100%

From the data in table 1, it is found that the learning outcomes are still low, where of the 34 students studied, 16 students (47%) obtained a score above the KKM or completed, while 18 students (53%) obtained a score below the KKM or incomplete. So the researcher intends to improve the learning outcomes of class VI.B by using the Jigsaw learning method.

At the planning stage of cycle I, the researcher prepares: 1) research implementation schedule; 2) consult with tutors and friends; 3) develop an assessment format; 4) prepare a learning implementation plan using the Jigsaw learning model. Next, the implementation of cycle I starts from the researcher entering the class and carrying out opening, core and closing activities. Observations were carried out during the learning process and analysis of student learning outcomes in cycle I was carried out. In the first cycle stage, a test was carried out with the following results.

Table 2. Cycle I Learning Results

Cycle I Results		Mark
Complete	18	53%
Not Completed	16	47%
Amount	34	100%

Based on data from table 2, student learning results in cycle I state that of the 34 students studied, 18 students (53%) obtained a score above the KKM or completed. Meanwhile, 16 students (47%) obtained grades below the KKM or incomplete. Based on the results of observations and evaluations in the implementation of cycle I, the indicators that have been set have not been achieved and are not in accordance with what is expected in learning, in this case there are still deficiencies that occur during the implementation of actions such as the use of less than optimal learning media, students who have difficulty solving problems on the LKPD, the number cards are not yet attractive, and some students still don't have the courage to ask questions and have opinions, so that if there is a problem in their group the students have difficulty solving it. In the classroom action research that was carried out, the researchers had not yet reached the requirements for success, so it was continued in cycle II.

In the implementation of cycle III, the researcher made the same preparations as in the implementation of cycle I, including planning, action, observation and reflection. In cycle II, the researcher corrected the deficiencies that occurred in the previous action. Researchers, in collaboration with tutor teachers, redesigned the learning implementation tools that will be used in the second cycle of action, preparing assessment sheets and evaluation tests. The implementation of cycle II still uses the Jigsaw learning model which consists of opening, core and closing activities. Observations were carried out during the learning process and analysis of student learning was carried out in cycle II. Based on the learning outcomes test in cycle II that was carried out, the following results were obtained.

Table 3. Cycle II Learning Results

Cycle II Results		Mark
Complete	22	65%
Not Completed	12	35%
Amount	34	100%

Based on data from table 3, student learning results in cycle II state that of the 34 students studied, 22 students (65%) obtained scores above the KKM or completed. Meanwhile, 12 students (35%) obtained grades below the KKM or incomplete. Based on the evaluation results in cycle II, there was an increase in learning outcomes when compared to cycle I. Reflection activities carried out in cycle II showed that the learning process and student learning outcomes were better, but there were things that still needed to be improved, namely students who were not yet conducive when distributing group. So the researcher took further action in cycle III.

In the implementation of cycle III, researchers prepared more optimally to implement learning to improve the learning previously carried out in cycle II. In cycle III, the researcher carried out the same preparation stages as the previous cycle, namely there were stages of planning, action, observation and reflection. The implementation of cycle III uses the Jigsaw learning model which consists of opening activities, core activities and closing activities. Observations were made during the learning process and analysis of student learning outcomes in cycle III was carried out. Based on the learning outcomes test in cycle III that was carried out, the following results were obtained.

Table 4. Cycle III Learning Results

Results of Cycle III		Mark
Complete	30	88%
Not Completed	4	12%
Amount	34	100%

Based on data from table 4, student learning results in cycle II state that the research results stated that of the 34 students studied, 30 students (88%) obtained scores above the KKM or completed. Meanwhile, 4 students (12%) obtained grades below the KKM or did not complete. Reflection activities carried out in cycle III showed excellent learning results by applying the Jigsaw learning model in the learning process, so that students obtained maximum learning results by achieving a success indicator percentage of 88%. In general, the Jigsaw learning model can improve the learning outcomes of class VI.B students in theme 1 subtheme 2 at Elementary School 25 Palembang.

Based on the table of learning outcomes from action implementation activities in the pre-cycle, cycle I, cycle II, and cycle III, it states that student learning outcomes increase in each cycle. The following is a recapitulation of student learning outcomes in each cycle.

Table 5. Recapitulation of Student Learning Results

Description	Pre-Cycle		Cycle I		Cycle II		Cycle III	
	Completed	Not Completed	Completed	Not Completed	Completed	Not Completed	Completed	Not Completed
Number of Students	16	18	18	16	22	12	30	4
Percentage (%)	47%	53%	53%	47%	65%	35%	88%	12%

The following is a presentation of the data in a diagram.

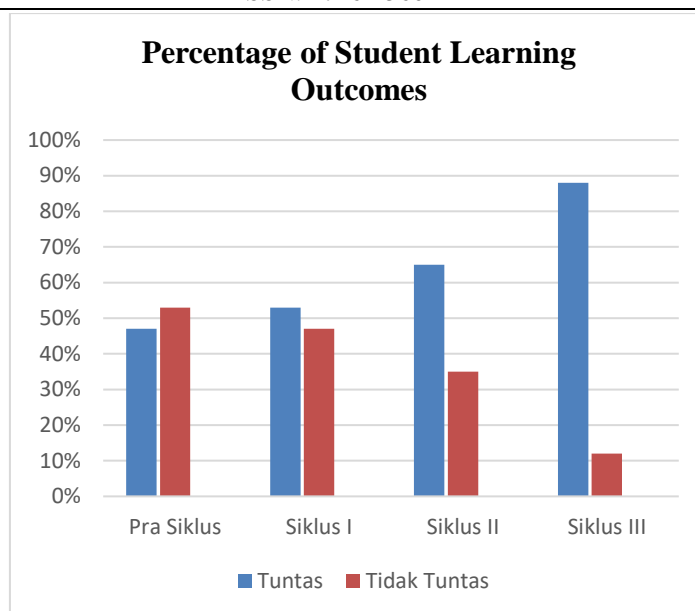


Figure 1. Percentage of Student Learning Outcomes

By paying attention to table 5, it can be seen that the increase in student learning outcomes from pre-cycle activities was 47%, in cycle I it was 53%, in cycle II it was 65%, and cycle III it was 88%, which exceeds the success indicator value of 85%. With the increase in learning outcomes through the Jigsaw learning model, this research was stopped in cycle III. Based on data on student learning outcomes in thematic learning theme 1 subtheme 2 using the Jigsaw learning model, students in class VI.B at Elementary School 25 Palembang experienced an increase.

Learning activities by applying the Jigsaw learning model based on the results of research that has been carried out have a positive and good impact on the learning process and learning outcomes of class VI.B students. The Jigsaw learning model helps students improve learning outcomes during thematic learning in theme 1 sub-theme 2. In addition, learning by applying the Jigsaw learning model helps students think critically in finding solutions to problems given, providing opportunities for students to collaborate with others, friends, actively involved in group activities, responsible for their duties and training students' courage to display their work in front of the class with confidence.

The jigsaw learning model is a solution in dealing with the problem of students who do not have a good cooperative attitude with their friends when in groups. In this model, students will collaborate with their friends because in implementing this jigsaw learning model, students are faced with two different groups, namely the home group and the expert group. Thus, like it or not, students have to work together, ask for opinions, propose opinions, and of course respect each other's opinions among their friends in the home group and in the expert group [31].

4. CONCLUSION

Based on the analysis of research results and discussions that have been carried out, it can be concluded that the application of the Jigsaw learning model can improve student learning outcomes in thematic learning theme 1 subtheme 2 class VI.B Elementary School 25 Palembang for the 2023/2024 academic year. This is proven by the percentage of students' learning outcomes increasing in each cycle, namely in the pre-cycle it was 47%, in cycle I it was 53%, in cycle II it was 65%, and in cycle III it was 88%.

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REFERENCES

- [1] Depdiknas. (2003). Undang-undang RI No.20 tahun 2003 tentang Sistem Pendidikan Nasional [Republic of Indonesia Law No.20 of 2003 concerning the National Education System].
- [2] N. Nurkholis, "Pendidikan dalam upaya memajukan teknologi [Education in an effort to advance technology]". *Jurnal Kependidikan*, vol. 1, no. 1, pp. 26, 2012.
- [3] S. N. Amalia, Amrah, & Hotimah, "Penerapan model pembelajaran kooperatif tipe jigsaw untuk meningkatkan hasil belajar pkn peserta didik kelas v sd [Application of the jigsaw type cooperative

- learning model to improve the civics learning outcomes of fifth grade elementary school students],” *Nubin Smart Journal*, vol. 3, no.1, pp. 12-21, 2023.
- [4] H. Setiadi, “Pelaksanaan penilaian pada kurikulum 2013 [Implementation of assessment in the 2013 curriculum],” *Jurnal Penilaian Dan Evaluasi Pendidikan* vol. 20, no. 2, pp. 166-178, 2016.
- [5] L. Dewi & E. Fauziati, “Pembelajaran tematik di sekoah dasar dalam pandangan teori konstruktivisme Vygotsky [Thematic learning in elementary schools in the view of Vygotsky's constructivism theory],” *Jurnal Papeda*, vol. 3, no. 2, 2021
- [6] I. S. Wati & Arwin, “Peningkatan proses pembelajaran tematik terpadu menggunakan model discovery learning di kelas iv sd [Improving the integrated thematic learning process using the discovery learning model in class iv elementary school],” *Jurnal inovasi pembelajaran SD*, vol.8, no.4, 2020.
- [7] S. Rahmawati and W. P. Lestari, “penerapan model pembelajaran jigsaw dalam meningkatkan hasil belajar tematik pada peserta didik kelas v sd nurul islam Surabaya [Application of the jigsaw learning model in improving thematic learning outcomes for class V students at Nurul Islam Elementary School, Surabaya],” *Conference of Elementary Studies*, 2020.
- [8] A. Asnawi, R. Fransyaigu, and B. Mulyahati, “Konsep pembelajaran terpadu dalam kurikulum 2013 di sekolah dasar [Integrated learning concept in the 2013 curriculum in elementary schools],” *Jurnal Seuneubok Lada*, vol. 3, no. 2 , 2016.
- [9] K. E, N. Nahak, N.S.Degeng, U.Widiati, “Pembelajaran tematik di sekolah dasar [Thematic learning in elementary schools],” *Jurnal Pendidikan*, vol. 4, no. 6, pp. 785-794, 2019.
- [10] K. I. Soetikno, M. E. Rindengan, and D. Tombokan. “Penerapan model pembelajaran jigsaw untuk meningkatkan hasil belajar tema berbagai pekerjaan di kelas iv sd inpres Kakaskasen III [application of the jigsaw learning model to improve learning outcomes on the themes of various jobs in class 4 elementary school inpres kakaskasen iii]”. *Jurnal pendidikan dasar*, vol. 4, no. 2, 2023.
- [11] F. Fitriani, “Pengaruh motivasi belajar dan disiplin terhadap hasil belajar ips siswa di smp karya indah kecamatan tapung [The influence of learning motivation and discipline on students' social studies learning outcomes at Karya Indah Middle School, Tapung District],” *Jurnal PeKA*, vol. 4 no, 2, 2016.
- [12] S. Sulastri, “Meningkatkan hasil belajar peserta didik melalui strategi pembelajaran berbasis masalah pada pembelajaran ips di kelas v sdn 2 limbo makmur kecamatan bumi raya [Improving student learning outcomes through problem-based learning strategies in social studies learning in class V SDN 2 Limbo Makmur Bumi Raya District],” *Jurnal Kreatif Tadulako Online*, vol. 3 no. 1, pp. 92, 2015.
- [13] R. Syaputri & R. Eliyasni, “Pengaruh model kooperatif tipe *jigsaw* terhadap hasil belajar tematik terpadu kelas iv sekolah dasar [The influence of the jigsaw type cooperative model on integrated thematic learning outcomes in grade IV elementary school],” *Jurnal Pendidikan Tambusai*, vol. 4, no. 3, 2020.
- [14] B. Syahri, M. Giatman, M. Muskhir, H. Effendi, and A. Hilman, “Model pembelajaran tipe jigsaw berbasis problem based learning untuk meningkatkan aktivitas dan hasil belajar [The jigsaw type learning model is based on problem based learning to improve activities and learning outcomes],” *Journal of Education Action Research*, vol. 7, no. 1, pp. 58-67, 2023.
- [15] A. K. Jeppu, K. A. Kumar, and A. Sethi, “‘We work together as a group’: implications of jigsaw cooperative learning,” *BMC Medical Education*, vol. 23, no. 1, pp. 734, 2023.
- [16] I. Irwan and H. Hasnawi, “Analisis Model Pembelajaran *Contekstual and Teaching and Learning* Dalam Meningkatkan Hasil Belajar PPKN di Sekolah Dasar”, *Jurnal Ilmiah Pendidikan*, vol. 3, no. 1, pp. 235-245, 2021.
- [17] I. P. T.Darmita, “Implementasi model pembelajaran kooperatif tipe jigsaw untuk meningkatkan prestasi belajar bahasa indonesia peserta didik kelas v semester i sd negeri 3 sawan [Implementation of the jigsaw type cooperative learning model to improve the Indonesian language learning achievement of class V semester I students at SD Negeri 3 Sawan]”. *Indonesian Journal of Educational Development*, vol. 3, no. 1, pp. 95-103, 2022.
- [18] R. M. Abobaker, M. S. Alamri, B. Alshaery, and A. Hamdan-Mansour, “Impact of Jigsaw Cooperative Learning Strat-egy on academic achievement and opinion among Nursing Students,” *J Holist Nurs Midwifery*, vol. 33, no. 1, pp. 43-51, 2023.
- [19] N. M. Hanapi, and M. M. M. Kamal, “Jigsaw classroom: A process of cooperative learning and discussion,” *Semarak International Journal of Innovation in Learning and Education*, vol. 1, no. 1, pp. 24-31, 2024.
- [20] O. C. Drouet, V. Lentillon-Kaestner, and N. Margas, “Effects of the Jigsaw method on student educational outcomes: systematic review and meta-analyses,” *Frontiers in Psychology*, vol. 14, pp. 1216437, 2023.
- [21] A. T. Kurniawan, S. Sudirin, and S. Firnanda, “The application of the jigsaw type cooperative learning model to improve social science learning outcomes,” *Bulletin of Pedagogical Research*, vol. 4, no. 1, pp. 34-44, 2024.

- [22] F. Zaenal, D. Darsan, and E. Intyas, "The effect of the implementation of the jigsaw model on students' motivation and learning outcomes in the subject of entrepreneurship at hidayatul muhtadiin vocational school," *Journal of Education Technology and Inovation*, vol. 6, no. 1, pp. 1-9, 2023.
- [23] Rusman, *Pembelajaran tematik terpadu*. Jakarta: PT Raja Grafindo Persada, 2012.
- [24] L. Farida, and S. Suyanto, "Improving student learning outcomes using the jigsaw type cooperative learning model in science lessons on the respiratory system material humanity in class v sdr. Mutiara kasih students," *Review Of Multidisciplinary Education, Culture And Pedagogy*, vol. 3, no. 1, pp. 55-66, 2023.
- [25] D. S. Susik "Upaya meningkatkan hasil belajar pada pembelajaran tematik tema "Makanan Sehat" Melalui penggunaan model pembelajaran kooperatif tipe jigsaw pada peserta didik kelas IV SD Citra Bakti [Efforts to improve learning outcomes in thematic learning with the theme "Healthy Food" through the use of a jigsaw type cooperative learning model for fourth grade students at Citra Bakti Elementary School]," *Jurnal Citra pendidikan*, vol. 8, no. 2, pp. 985, 2023.
- [26] S. Suhartika "Meningkatkan kemampuan membaca intensif dengan penerapan belajar berkelompok pada peserta didik kelas II SDN Bedus tahun pelajaran 2017/2018 [Improving intensive reading skills by implementing group learning for class II students at SDN Bedus in the 2017/2018 school year]," *Jurnal Ilmiah Mandala Education*, vol. 4 no. 2, 2018.
- [27] U. Habibah, "Meningkatkan aktivitas dan hasil belajar matematika peserta didik madrasah ibtidaiyah melalui model PAIKEM [Increasing the activities and mathematics learning outcomes of madrasah ibtidaiyah students through the PAIKEM model]". *Journal Of Elementary Education*, vol. 2, no. 2, 2013.
- [28] H. Pontoh, "Penerapan model pembelajaran jigsaw untuk meningkatkan hasil belajar ilmu pengetahuan sosial (ips) peserta didik kelas v sd inpres salabenda kecamatan Bunta [Application of the jigsaw learning model to improve social science (IPS) learning outcomes for class V elementary school students in Presidential Instruction, Salabenda, Bunta sub-district]," *Jurnal kreatif tadulako online* vol. 4, no. 11, pp. 204, 2018.
- [29] Suismanto, "Peningkatan hasil belajar peserta didik melalui model pembelajaran kooperatif jigsaw pada pembelajaran matriks [Increasing student learning outcomes through the jigsaw cooperative learning model in matrix learning]," *Jurnal Karya Ilmiah Guru*, vol. 8, no. 1, pp. 36, 2023.
- [30] K.I Soetikno, "Penerapan model pembelajaran jigsaw untuk meningkatkan hasil belajar tema berbagai pekerjaan di kelas iv sd inpres kakaskaen iii [Application of the jigsaw learning model to improve learning outcomes on the themes of various jobs in class IV to Inpres Kakaskaen III]," *Jurnal Pendidikan Dasar*, vol. 4, no. 2, 2023.
- [31] A.S. Alfazr, D. Gusrayani, & D.T Sunarya, "Penerapan model pembelajaran jigsaw untuk meningkatkan hasil belajar siswa dalam menemukan kalimat utama pada tiap paragraph [Application of the jigsaw learning model to improve student learning outcomes in finding the main sentence in each paragraph]," *Jurnal Pena Ilmiah*, vol. 1, no. 1, 2016.