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Jigsaw Type Cooperative Learning Assisted by Genially Media to Improve the Students Activity and Learning Outcomes of IPAS

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Abstract: This study aims to analyze the effectiveness of the implementation of the Jigsaw type cooperative learning model assisted by Genially media in improving the activity and learning outcomes of fifth grade students of Triharjo Elementary School in the subject of science. This study uses the Classroom Action Research (CAR) method with the Kemmis and McTaggart model which is carried out in two cycles at Triharjo Elementary School, Sleman, to improve the activity and learning outcomes of fifth grade students in the subject of science. Data were collected through observations of student learning activities using observation sheets and multiple-choice tests of 20 questions that have been validated by material experts. The success of this study was determined based on an increase in student activity that reached a minimum of 75% and student learning outcomes that met the achievement criteria of 80% with a minimum score of 75. This study shows that the implementation of the Jigsaw type cooperative learning model assisted by Genially media is effective in improving the activity and learning outcomes of fifth grade students of Triharjo Elementary School in the subject of science. Before the action, student participation and learning outcomes were still low, but after the implementation of this model, there was a significant increase, especially in Cycle II with an average learning outcome reaching 77.71%. This learning model has been proven to increase student motivation, engagement, and understanding, making it a more effective alternative learning method.

Keywords: Elementary education; Genially Media; IPAS; Jigsaw type cooperative learning; Learning activity; Learning Outcomes

Introduction

Education is a conscious effort to educate the nation's life, both in the form of formal and informal education (Ketut Sudarsana et al., 2019; Mbilu, 2019; Rotaru, 2021). This potential includes spiritual strength and self-control (Nurhidayatu'rohman et al., 2024). Teachers play a very important role in improving the quality of education management and learning quality, in accordance with the demands of the Law (Darling-Hammond, 2021; Li et al., 2024). Teachers are not only tasked with teaching, but also developing students' skills, character, and talents (Ibragimovich et al., 2021). In addition, teachers are expected to be able to shape students' perspectives in the learning process, especially in the subject of Natural Sciences (IPA).

But in practice Chiu et al., 2016; Ruhama et al., 2021 Learning does not provide opportunities for students to improve the ability to think and argue (Resmi, 2022). Lack of attractive learning models, can make students less interested in following the learning process, making students less active during the learning process. When the teaching and learning activity process takes place, learning is still centered on the teacher, the teacher also only uses conventional learning models continuously, causing students to be less interested in paying attention to the teacher's explanation. thus making students' activeness during the learning process is still low and

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can cause less than optimal learning outcomes (Anadia et al., 2023). The educational process that is established is still not optimal. The method used in learning tends to be monotonous and still centered on the teacher. Educators still often apply conventional learning methods in the form of lectures, which will reduce student learning interest and can affect their learning outcomes (Syahri et al., 2023).

According to Wandini et al. (2019), the learning model is a system that includes a conceptual framework that illustrates systematic procedures for carrying out learning activities that have been designed (Ahmad et al., 2024). This model functions as a guide for learning designers and teachers in achieving the desired goals. One model that can be applied to improve student learning outcomes is the cooperative learning model type of snake -ladder match assisted by intelligent media games. This model aims to create more effective learning and can improve student learning outcomes (Ibrahim et al., 2023; Safitri et al., 2023).

Jigsaw type cooperative learning model, developed by Aronson et al., Is one of the techniques in cooperative learning. According to Lie (2008), this model focuses on schemata or background of students' experiences, with the aim of activating previous knowledge so that learning materials become more meaningful (Susilowati, 2022). Jigsaw learning involves the exchange of information between groups, but with the characteristics in which each student is responsible for teaching certain material to the group members (Odja, 2023; Sari et al., 2023). Thus, in this model, each student acts as an expert in a particular topic and share his knowledge with his friends in the group (Dewanto et al., 2023; Juniawan et al., 2023; Suzanti et al., 2023).

The stages in the Jigsaw type cooperative learning model can be explained through five main steps (Maielfi & Wahyuni, 2020; Nashiroh et al., 2020; Salhuteru et al., 2025). First, the origin group was formed, and each student was given a different serial number. Second, each student in the group originally receives different material according to the number given (Faiqoh & Asih, 2025; Prawiyogi et al., 2024). Third, students with the same number join to form an expert group, each of whom studied the same material topics (Susilowati & Ismanto, 2023; Widiawati et al., 2023). Fourth, after studying the material, students return to the original group and convey the knowledge they have learned. Finally, an evaluation is carried out to assess student understanding. Through this stage, it is hoped that every student can feel responsible for their learning process and be more active in sharing knowledge with their friends. This learning model also encourages students to be more comfortable in expressing ideas and ask questions related to material that is not yet understood, so that their understanding of pedagogical topics can be better.

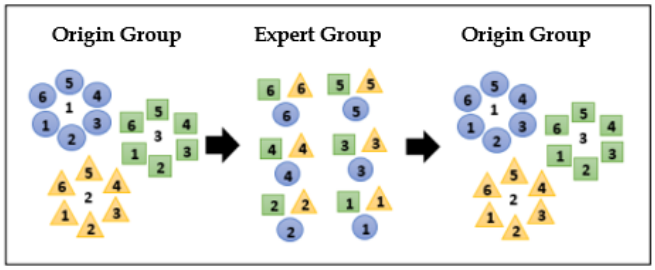

Figure 1. Description of the stages of the Jigsaw type cooperative learning model

Some of the predecessor works, namely the application of the Jigsaw type of cooperative model assisted by Realia media significantly influenced the improvement of sociological learning outcomes at SMAN 1 Gunungsari (Dewi et al., 2024). Significant differences in biological learning outcomes between students who use jigsaw type cooperative models and group investigations (KI) in assisted by audio visual media at SMAN 1 Praya Central Academic Year 2022/2023 (Eliana et al., 2023). The application of the Jigsaw type cooperative learning model can increase student activity and learning outcomes in ecosystem change material, with the percentage of increased activity from 60% in cycle I to 89% in cycle II, and student learning outcomes increased from 60% to 90% (Apriana, 2024).

This research was conducted at SD Triharjo in class V students who have a level of participation and learning outcomes that are still low in IPAS subjects. Based on initial observations, student learning activities are less than optimal, with many students who are still passive in discussion and less involved in the learning process. Learning outcomes also show achievements that have not met the minimum completeness standards, with most students get a score below completeness. The main factor that affects this condition is the learning method that is still conventional and the lack of utilization of interactive media in the learning process.

Most previous research on the Jigsaw type cooperative learning model only emphasizes the increase in learning outcomes without optimizing the use of digital technology as a supporting medium. In addition, research that uses digital -based media such as genially in learning IPAS at the elementary school level is still limited. Therefore, this research fills the gap by integrating the jigsaw model assisted by genially media to increase student learning activities and outcomes more effectively. The novelty in this study lies in the application of the Jigsaw type cooperative learning model combined with interactive media genially to increase students' involvement and understanding of

Learning IPAS. In contrast to previous studies that use more conventional or digital media separately, this research combines both aspects to create learning experiences that are more dynamic, interesting, and effective for elementary school students.

This research is relevant to the 21st century learning needs which demands the use of technology in increasing the effectiveness of learning. The results of this study are expected to contribute to teachers in developing more attractive and interactive innovative learning strategies. Practically, this research is useful for students in increasing their motivation, activities, and learning outcomes. In terms of academic, this research enriches literature related to cooperative learning assisted by technology in the context of basic education. This study aims to analyze the effectiveness of the application of the Jigsaw type of cooperative learning model assisted by the media genially in improving the activities and learning outcomes of students in class V SD Triharjo in IPAS subjects.

Method

This research is PTK in Triharjo State Elementary School, Sleman, with the research subjects of all class V students totaling 25 students. This study was conducted in two cycles, where each cycle consists of four main stages, namely planning, implementation of actions, observations, and reflection/analysis. The PTK model used is the Kemmis and MCTAGGART (2014) model, which focuses on continuous improvement through two research cycles.

The data in this study were collected through observation and tests. The instruments used include observation sheets to measure student activities and test questions consisting of 20 multiple choice questions regarding science material about renewable energy and environmentally friendly. Observation sheets focus on seven indicators of student activity, including listening to the teacher's explanation, asking questions, discussing in groups, recording a summary of material, expressing opinions, and presenting group work results. The maximum score for each indicator is 4. Indicators of the success of this study are divided into two main categories. Student activity is measured through an observation sheet that records various student activities during learning. Success is considered to be achieved if the percentage of student learning activities reaches 75% or more, which means student activity is categorized in the "high" category. Student learning outcomes are measured using a test consisting of 20 multiple choice questions. Success in learning outcomes is considered to be achieved if 80% of students get a minimum score of 75 in the test.

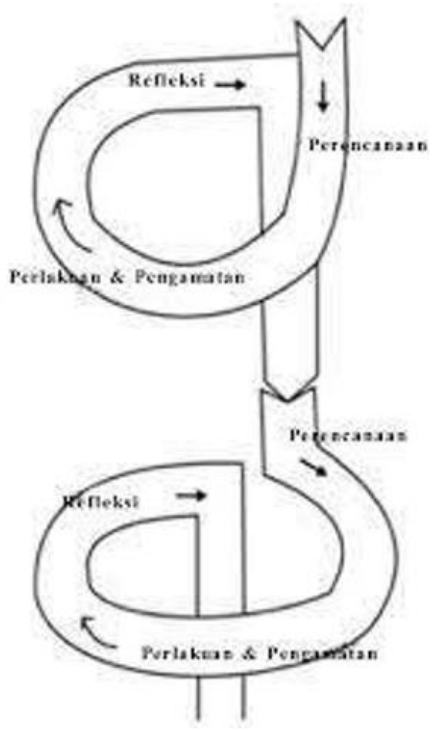

Figure 2. Classroom Action Research Model by Kemmis Taggart

This study was conducted in two cycles, with each cycle through four stages: planning, implementing action, observation, and reflection/analysis. At the planning stage, the teacher designs a learning plan that involves the use of Jigsaw type cooperative learning models and genially media. This plan includes the preparation of test questions that are relevant to the material, as well as observation sheets to monitor student activities. Indicators of success specified are student learning activities reaching 75% and student learning outcomes with criteria for the achievement of learning objectives (KKTP) ≥ 75%. At the stage of implementing action, learning is carried out in accordance with the plans that have been prepared. Students are divided into small groups to discuss about renewable energy material using genially media. During the learning process, the teacher monitors student activities through an observation sheet and provides opportunities for students to ask questions, discuss, and present group work.

Observation, the teacher observes student activities during the implementation of learning, recording student involvement in discussions, the ability to answer questions, and the courage of students to express opinions. This observation aims to assess the extent to which students are involved in learning and whether the learning objectives are achieved. Reflection/analysis, after the first cycle is complete, the teacher and researchers reflect on the results obtained, both in terms

of learning activities and test results. The results of this reflection are used to plan improvements in the second cycle. This improvement can include learning strategies, increasing student interaction, or other changes that are deemed necessary to achieve better goals in the next cycle.

This study uses two main instruments: Student activity observation sheets and test questions. Observation Sheet Student Activity, Observation Sheet is used to record student activities during learning. Student activity is assessed based on seven established indicators, with a maximum score of 4 for each indicator. This instrument is validated by education experts and is tested for reliability through inter-risk reliability tests to ensure the consistency of observations between observers. The test questions consist of 20 multiple choice questions that aim to measure students' understanding of science material on renewable energy and environmentally friendly. These questions are validated by material experts to ensure suitability to the topic taught, and are tested to ensure their reliability.

Calculation of success with student learning activities and student learning outcomes. Student activity is calculated based on the score obtained on the observation sheet and compared to the maximum score that can be obtained. The percentage of student learning activities is calculated by the following Formula 1.

$$\% \text{ learning activities} = \left(\frac{\Sigma \text{Score obtained}}{\Sigma \text{Maximum score}}\right) \text{x}100\% \quad (1)$$

Student learning activities are categorized as "height" if the percentage reaches 75%-100%. Student learning outcomes, calculated based on the number of correct answers and expressed in the form of percentage.

$$\% \text{ learning outcomes} = \left(\frac{\text{Correct answers}}{20}\right) \text{x } 100\% \quad (2)$$

Success in learning outcomes is considered to be achieved if 80% of students get a minimum score of 75.

Result and Discussion

Pre-driving

In the pre-action stage, a series of steps are carried out to find out the initial conditions before the implementation of the Jigsaw type of cooperative learning model assisted by the media genially in increasing the activities and learning outcomes of students in class V SD Triharjo in Natural Sciences subjects. At the planning stage, the researcher first identifies the problems faced by students in learning. After that, a research instrument was prepared in the form of an observation sheet of student activities and learning outcomes tests. The science learning material that will be used in research is determined carefully, accompanied by the preparation of learning tools, including teaching materials and genially media which will later be used as a tool in learning. In addition, researchers also set indicators of research success based on increasing student learning activities and outcomes.

At the treatment stage or action, learning is still carried out conventionally without the application of jigsaw models assisted by genially media. The teacher delivered the material classically with the lecture and question and answer method. Students tend to receive material passively with minimal involvement in learning. To find out the initial conditions of students, an initial evaluation is carried out through a test to measure learning outcomes before being given treatment. In addition, observations are also made to see the extent of student activities in following learning. The results of observations during conventional learning show that student participation in discussions is still low. Most students only listen to the teacher's explanation without active interaction. Student learning activities are relatively low with an average score of 45.57%, with the lowest score of 8 and the highest score of 21.

Based on the results of these observations, reflection and analysis of the initial learning conditions. Concluded that conventional learning methods are less effective in increasing student learning activities and outcomes. The lack of interaction and involvement of students in the learning process inhibits their understanding of the material being taught. Therefore, a more active and innovative learning strategy is needed to increase student participation. The Jigsaw type of cooperative learning model assisted by genially media is designed as an alternative to increasing student learning activities and outcomes in the next cycle.

Cycle I

At the planning stage, researchers designed learning by applying the Jigsaw type cooperative learning model that was assisted by genially media. This plan is aimed at increasing the activities and learning outcomes of students in IPAS subjects in class V SD Triharjo. The first step in planning is to prepare a Learning Implementation Plan (RPP) based on the Jigsaw model. Furthermore, IPAS learning material is prepared in an interesting format through genially media so that students more easily understand the concepts taught. In addition, the formation of a learning group is carried out by considering the heterogeneity of students in academic aspects and learning characteristics. In order for the research to run optimally, observation instruments to monitor student activities and learning outcomes evaluation sheets are prepared carefully. Coordination with class teachers is also carried

out to ensure the implementation of learning in accordance with the design that has been prepared.

The action stage is the implementation of the plan that has been prepared. The learning process begins with apperception by the teacher who aims to build the initial understanding of students of the material to be learned. The teacher also explains the learning objectives so that students understand what is expected from the learning session. Furthermore, students are divided into jigsaw groups, where each group member is responsible for understanding certain parts of the material. After understanding the part of each of the material, students who have the same material gather in the expert group to discuss deeper with the help of genially media. After gaining adequate understanding, they returned to their original group and explained the material to other group members. In this way, each student has an active role in the teaching and learning process. The teacher plays a role in guiding and providing clarification if there is an inappropriate understanding. At the end of the learning session, an evaluation is carried out through individual tests to measure the extent of students' understanding of the material that has been learned.

During the learning process, observations were made on student involvement in learning activities. Based on the results of observations, it was found that most students had been active in group discussions. However, there are still some students who tend to be passive and lack of participation in discussions. The use of genially media is proven to help students understand the concepts being taught. However, there are still some students who have difficulty accessing and utilizing the media optimally. Overall, student activities in learning are categorized in moderate levels. The learning evaluation results show that the lowest score obtained by students is 12, while the highest score reaches 24. The average student learning outcomes in the first cycle are 69.28%, which shows that there is still space for improvement in the learning process.

Based on the results of observations and evaluations, reflection is carried out to determine the improvement steps in the next cycle. Some important findings in cycle I show that student involvement in group discussions still needs to be improved. Therefore, additional strategies need to be applied so that passive students can be more active in learning activities. In addition, the use of genially media needs to be maximized by providing clearer guidelines to students so that they are more accustomed to using it in learning. The teacher is also expected to provide more intensive assistance, especially for students who have difficulty in understanding the material. By making improvements in group instructions and management, it is expected that student learning activities and outcomes can increase in the next cycle. These improvement steps will be applied systematically to ensure better learning effectiveness.

Cycle II

In the second cycle planning stage, researchers develop a more mature strategy to increase the effectiveness of jigsaw. The steps taken in this plan include various aspects to ensure that the learning process can run better than the previous cycle. One of the first steps taken is the preparation of a more structured learning plan. Researchers adjust the material and learning methods to be more suitable for the characteristics of class V students of SD Triharjo. In addition, researchers also optimize interaction between students in small groups by preparing a more systematic discussion guide so that they can better understand the material in depth. Furthermore, researchers prepare more interactive teaching materials based on genially. This media is used to help students understand science concepts more easily through visual appearance, animation, and interactive quiz. In addition, researchers also compile more systematic observation instruments.

At the action stage, learning is carried out in accordance with the plans that have been prepared. The Jigsaw in cycle II is carried out more directed and structured. The learning process begins with the division of students into small groups. Each group member is given the responsibility to study certain parts of the specified material. After that, students who have the same material gather in the expert group to discuss more deeply. This discussion allows students to understand the concept more thoroughly before they return to their original groups to explain the material to other group members. In this learning process, the media genially is used to help students understand science concepts more easily. This media presents animation, simulation, and interactive quiz that makes learning more interesting and easy to understand. The teacher also plays an active role in facilitating discussions by giving direction, motivation, and guidance so that students are more confident in delivering material to their groups of friends.

The observation phase is carried out to observe the extent of learning with the jigsaw type cooperative model assisted by the media genially successfully increasing student learning activities and outcomes. During the learning process, observations of student participation and involvement in their discussion and understanding of the material presented. The results of observations show an increase in the active involvement of students in group discussions. They are more enthusiastic in participating and showing better understanding than the previous cycle. In addition, students become more independent in understanding and delivering material to their group of friends. Media

Genially is proven to help in visualizing science concepts that are difficult to understand verbally. With a more attractive and interactive appearance, students more easily understand the material and motivated to learn. Based on observations, student learning activities have increased with the category of "high activity." In terms of learning outcomes, the lowest score obtained by students is 18, while the highest score reaches 28, with an average class of 77.71%.

At the reflection stage, an analysis of the success of the second cycle and aspects that still need to be improved. The results of the reflection show that the application of jigsaw type jigsaw is able to significantly increase student activities and learning outcomes. They are more confident in delivering material to their group friends and more independent in understanding the concepts given. In addition, genially media has proven effective in helping students understand the concept of science more easily, especially for abstract material.

Student learning outcomes also experienced an increase, as seen from the average class value which reached 77.71%. In addition, students show a more enthusiastic attitude in following learning because the methods applied are more interesting and interactive. Based on the results of this reflection, it can be concluded that the application of the jigsaw type of cooperative learning model assisted by the media has succeeded in increasing the activities and learning outcomes of students in class V SD Triharjo in Natural Sciences. Given the better achievement compared to the previous cycle, no additional cycles are needed. Thus, this learning model can be used as an effective alternative to improve the quality of science learning at the elementary school level.

Table 1. Data on Student Learning Activity Scores in Pre-action, Cycle I, and Cycle II

Description Reviewed From	Pre-action	Cycle I	Cycle II
Lowest Score	8	12	18
Highest Score	21	24	28
Average	45.57%	69.28%	77.71%
Category	Low Activity	Medium Activity	High Activity

Table 2. Data on Students' Science Learning Outcomes in Pre-Action, Cycle I, and Cycle II

Description Reviewed From	Pre-action	Cycle I	Cycle II
Number of students in grade V	25	25	25
The highest score	85	92.5	100
Lowest value	42.5	65	67.5
Average value	54.4	79.8	85.9
Number of students who completed	10	14	22
Number of students who did not complete	15	11	3
Percentage of Learning Outcome Completion	40%	56%	88%
Percentage of Incomplete Learning Outcomes	60%	44%	12%

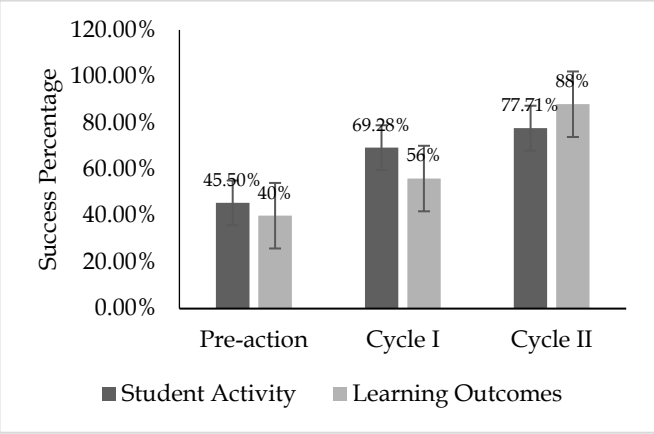

Figure 3. Increasing Student Activity and Learning Outcomes

Discussion

Jigsaw has proven to be an effective strategy in increasing the activities and learning outcomes of students in class V SD Triharjo in IPAS subjects. It seems that this learning model is able to overcome various obstacles in conventional learning that tends to make students passive. At the pre-action stage, observations show that student participation in learning is still low. Students tend to be recipients of passive information with minimal involvement in discussions. This is reflected in the score of learning activities which only reached an average of 45.57%, as well as low learning outcomes with the lowest score of 8 and the highest 21. This condition shows the need for changes in learning strategies so that students are more active and their learning outcomes increase.

Implementation of Jigsaw in Cycle I began to show positive changes in student involvement. In this method, students are divided into small groups, each of which is responsible for understanding certain parts of the material before sharing it with other group members. This approach encourages students to be more active in the learning process, both in expert groups and in their origin groups. Although the learning outcomes in the first cycle have increased compared to pre-action, there

are still several obstacles. Some students still tend to be passive in discussion, and there are obstacles in the use of genially media. Overall, on average to 69.28%, with the lowest score of 12 and the highest score of 24. However, this value still shows the existence of space for improvement.

In cycle II, a learning strategy improves by increasing the effectiveness of group discussions and optimizing the use of genially media. Researchers provide more systematic discussion guidelines, provide more intensive assistance to students who have difficulty, and ensure that the media can be used optimally. This improvement gives more significant results than cycle I. Based on the results of observations in cycle II, student activity in learning increases significantly. Students are more enthusiastic in discussing, more confident in delivering material to their group friends, and more independent in understanding the concepts taught. Genially media has been proven to be an effective tool in visualizing science concepts. In terms of learning outcomes, the lowest score of students increased to 18, while the highest score reached 28, with an average class of 77.71%.

This is also supported by several predecessors who state that this learning increases the activities and learning outcomes of science that positive influence on increasing collaboration and learning outcomes from science v elementary school (Raditya et al., 2023). Successful in improving the social studies of IVA students at SD Negeri 4 Kampung Baru 2017/2018 Academic Year (Suryanita & Kusmariyatni, 2019). Has a positive effect on the speaking skills of grade IV SD students (Febiyanti et al., 2020).

Analysis of the theory compatibility with field data in this study shows a strong compatibility between various learning theories with the results obtained from the application of the jigsaw type of cooperative learning model assisted by genially media. First, Vygotsky's social constructivism theory is very relevant to the findings of this research, where students learn through social interaction in expert groups and origin groups. The Zone of Proximal Development (ZPD) concept is also realized where students who better understand the material help their friends (Abakah, 2023). This is reflected in increasing student activity during the group discussion process, especially in cycle II, which shows that learning based on social interaction and collaboration helps students better understand the material.

In addition, Piaget's cognitive constructivism theory and Bruner's theory support the idea that learning occurs through the active interaction of students with their material and environment (Saleem et al., 2021; TomljenoviÄ & TataloviÄ, 2020). In this study, students actively build their understanding through exploration in expert groups, discussing, and sharing information, in accordance with the principles of these two theories. The use of interactive media that interactive enrich learning experiences, helps students understand more complex concepts, which shows that technology can increase student involvement and understanding (Alismaiel et al., 2022; Huang et al., 2019; Lubis, 2021). Theory of reinforces the findings that technology -based collaborative learning can increase student understanding. Learning using genially media in the jigsaw model is proven to increase student interaction and learning outcomes, which are in line with this theory (Alismaiel et al., 2022; Arafah et al., 2023; Huang et al., 2019).

That students build their understanding through active collaboration with others are reflected in field data that shows an increase in student learning activities and outcomes (Suwannaphisit et al., 2021). Collaboration that occurs in expert groups and groups of origin supports this principle. Vygotsky's theory is also relevant to the findings that effective learning occurs when students work together in social cooperation, where students can solve problems that are more difficult than their abilities.

Method very suitable for the findings of this research, which shows that the Jigsaw model encourages students to work in small groups and teach each other. This is reflected in increasing student activity, especially in cycle II, where students with a better understanding of helping their friends who have difficulty (Fijriah et al., 2024; Harefa, 2020). Megawati et al. (2021) which states that the jigsaw model supports the development of higher mental functions, such as logical reasoning and decision making, also in line with field data. The use of genially media in the jigsaw model helps students in developing logical reasoning skills and decision making related to more complex science concepts are also relevant because the Jigsaw model encourages students to take responsibility in learning and teach friends of their groups, who are reflected in increasing significant material understanding in cycle II (Anitra, 2021; Lubis, 2021).

Motivation is a change in energy in a person who encourages individuals to act to achieve goals. In the context of this study, student motivation to be actively involved in group discussions increases along with the application of the jigsaw model and the use of genially media (Rahman, 2022). In cycle II, students showed an increase in enthusiasm and confidence in discussions, which reflect an increase in internal motivation. This shows that interactive and interesting learning methods have succeeded in increasing student motivation to actively participate in learning.

Learning motivation as a strength in students who encourage learning activities and ensure their

sustainability. Field data shows that after applying the jigsaw and media models, students showed a significant increase in learning and learning outcomes (Rahmadania & Aly, 2023). This confirms that this learning strategy has succeeded in encouraging students to be more active and enthusiastic in their learning process. The importance of self -regulation in motivation, which involves the ability of students to manage their time and effort in learning. The use of genially media that offers visual and interactive appearance helps students in managing their efforts to better understand the material (Luo et al., 2021). This is proven in cycle II, where students become more independent in understanding and explaining the material to their group friends.

Mayer's cognitive load theory is also very relevant in the context of this research. Mayer explained that double channels, namely visual and auditory, can help students process information more efficiently. The genially media used in this learning presents material with interactive animations, simulations, and quizzes that allow students to access information through both channels (Suwarno, 2020). The observations show that the use of this media helps students understand more abstract science material more easily, reduce cognitive burden, and increase their understanding. The collaborative learning through technology is also relevant to the findings in this study. The technology can enrich collaborative learning, and the use of genially media in the jigsaw model is proven to support this. Students who work in expert groups to understand the material and then teach back to the group as long as they show active collaboration. Media Genially facilitates this interaction, which is seen in increasing student involvement during group discussions and interactions (Muthalib et al., 2024).

However, as explained by Sari et al. (2023), the challenges in the use of technology for character education were also identified in this study (Sumianto et al., 2024). Although the use of genially media increases student involvement and learning outcomes, some students have difficulty in accessing and utilizing the media optimally. This is an important note for improvement in the second cycle, shows that although technology can improve learning, supervision and assistance from teachers is needed so that technology can be utilized optimally by all students.

The results in the pre-action stage, student participation in learning is still low with an average learning activity score of only 45.57%, and low learning outcomes with the lowest score of 8 and the highest 21. After applying the jigsaw model assisted by the genially media in cycle I, student activity increases, but there are still several obstacles, such as passive students and difficulty in utilizing the media genially. The evaluation results in the first cycle show the average student learning outcomes of 69.28%, with the lowest score of 12 and the highest 24.

In cycle II, improvements are carried out by increasing interaction between students and providing more systematic discussion guidelines. The use of genially media is also optimized by providing more intensive assistance to students. As a result, student activity increased significantly, with an average learning outcomes reaching 77.71%, and the lowest score of 18 and the highest score of 28. Overall, the application of this method is successful in increasing motivation, involvement, and understanding of science material, making it more effective alternative learning (Suryana et al., 2022).

Conclusion

The conclusion is that the effective application in class V SD Triharjo in IPAS subjects. Before the action, students learn and learn learning are still low. After the application of this model in the first cycle, there is an increase, although there are still obstacles in the use of generation media. In cycle II, by improving learning strategies. This model is proven to increase motivation and involvement. The teacher can adopt this model as a more interactive and collaborative learning strategy to increase student involvement. It is recommended for educators to provide more intensive guidance in the use of genially media to be more effective. Further research can explore the integration of jigsaw models with other technologies for more optimal results. This research is only conducted in one class, so the results cannot be generalized to a broader context.

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Author Contributions

Chairul Kusuma Anjani has a role in conceptualizing research, designing a study framework, collecting data, and contributing to the writing of manuscripts. Ana Fitrotun Nisa is responsible for conducting a literature review, analyzing data, and assisting in the preparation and editing of the manuscript. Akbar Al Mosque provides a methodological insight, helps in organizing learning interventions in class, and contributing to data validation. Meanwhile, Banun Havifah Cahyo Khosiyono contributed to implementing the Jigsaw model, integrating Genially media, and reviewing the manuscript. All authors approved the final version.

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Conflicts of Interest
The authors declare no conflict of interest.

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