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Implementation of the Jigsaw Type Cooperative Model Using Pop Up Book Media to Increase Elementary School Students' Mathematics Learning Activeness

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Abstract : The aim of this research is to find out how to apply the Jigsaw Type Cooperative learning model in increasing student activity in elementary school mathematics learning. The research method used is a classroom action research method that uses the development model by Kemmis and Mc. Taggart. The subjects of this research were 32 class VI students at SD Negeri 207/IV Jambi City. Data was collected using observation techniques, questionnaires and written tests. Data analysis uses quantitative descriptive analysis. The results of the research prove that the application of the jigsaw cooperative learning model can increase the learning activity of class VI students in the mathematics subject of plane figures. The average results of observing students' learning activity in cycle I was 87.52%, in cycle II it increased to 90.00%, the results of the student learning activity questionnaire obtained an average in cycle I of 60.55% and in cycle II it increased to 89.31%.

Keywords : Jigsaw cooperative learning, Active learning of students, Mathematics.

INTRODUCTION

Learning is a change in the skills, actions or behavior of students that is permanent as an experience or training that has been carried out by students. This change in skills only takes place quickly and will reappear to the original behavior which shows that the teaching and learning process has not been successful, even though the teaching process may have occurred (Mulyadi, 2022). Where success in the teaching and learning process requires active learning, namely the participation of teachers and students who work together to achieve planned learning goals (Kiska, Haryanto, & Indryani, 2024). Apart from that, according to Rahmi, Nurasiah & Kamza (2021) who said that in learning activities there is a need for methods that will help teachers in the learning process and will influence students' active

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learning. Based on this, it can be said that students' active learning can be said to be the efforts made by students which aim to grow their abilities during the teaching and learning process, from the learning carried out to achieve learning goals.

Students' active learning is a fundamental element that is very important for achieving success in the learning process. This is reinforced by the opinion of Syaparuddin, Meldianus & Elihami (2020) who stated that students' active learning is an effort that motivates them to have a great desire to participate in learning activities in order to achieve the expected learning goals. Active learning itself can make students better in all aspects of participating in learning activities (Sabil, et al. 2021). The benchmarks for students' learning activeness have several aspects, namely: 1) Students actively participate in implementing problems in learning, 2) Students' involvement in being able to solve problems, 3) Students' courage in being able to ask questions about unknown problems. with peers or teachers, 4) Trying to obtain a variety of information in order to solve the problems faced, 5) Carrying out discussions with a group of friends, 6) Being able to measure personal skills and the results obtained, 7) Educating students to be able to solve problems, 8) Getting the opportunity to use or apply the things obtained to overcome the tasks given (Rahayu, 2021). Based on this, it can be said that educators must be able to implement learning conditions that foster active learning in students so that they can be creative in the learning process.

Based on the results of initial research conducted on the problems at SD Negeri 207/VI Jambi City, namely that in group discussions the students were not fully active and the implementation of the learning model carried out was not in line with the students' character. In connection with this problem, in the learning process it is important to improve learning models that are suitable for increasing student activity. Choosing an appropriate strategy for each concept can achieve learning objectives well (Arifin, 2018). This is reinforced by the opinion of Pratama & Khaq (2022) who say that the learning model that can increase student activity is the jigsaw type cooperative learning model. Jigsaw is a cooperative learning model that is implemented by forming small, diverse discussion teams. Then, in the teaching and learning procedure, all students participate and receive responsibilities in the form of worksheets which are the key to discussions in their respective groups (Trisniawati et al., 2016). According to Asmara, (2020) jigsaw learning is cooperative learning which will divide students into teams of 4 to 6 people in a diverse group and collaborate with each other to have good involvement and be responsible for the success of solving tasks assigned to different teams. Based on this, it can be said that learning using the jigsaw cooperative learning model

has the aim of improving teamwork and understanding the learning material in more depth which is impossible to obtain if students study all the material personally.

This is reinforced by several studies which prove that there is an increase in the results of active learning using jigsaw cooperative learning. Among them by Zakiah, Prasetyo & Astutiningtyas (2019) where the results of research on learning activities during the first cycle of students were classified as quite active, but during cycles II and III there was an increase in the active category. Furthermore, research conducted by Febriany (2019), the results of cycle I showed that students achieved completeness with a percentage of 72.00% and during cycle II this increased to 88.00%. Based on the description above, the researcher is interested in conducting research to find out how to apply the jigsaw type cooperative learning model in increasing the learning activity of students in class VI at SD Negeri 207/VI Jambi City in mathematics learning about flat shapes.

RESEARCH METHODS

The research used is Classroom Action Research (PTK). This is reinforced by Gainau (2016) who said that PTK is research carried out through actions or treatments carried out in the classroom by educators or researchers. The main aim of PTK is to improve and grow the professionalism of educators in handling problems in the teaching and learning process (Nurdin, 2016). This research was carried out in a participatory manner, namely the researcher was assisted by colleagues (observers). This research was carried out in II cycles, and applied the spiral model from Kemmis & Mc Taggart which consists of planning, implementation, observation and reflection.

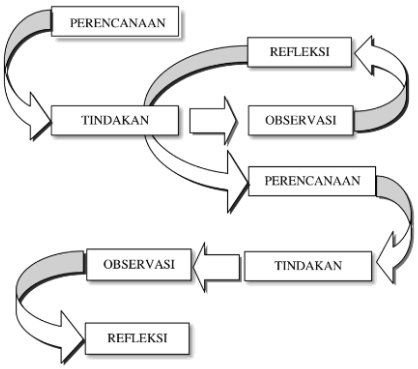

Figure 1. Research Spiral Model Chart According to Kemmis & Mc Taggart

This research was conducted at SD Negeri 207/VI Jambi City, class VI, in the mathematics subject of flat shapes. This research was carried out for 2 weeks by carrying out 2 cycles, each cycle having 2 meetings. The subjects in this research were class VI students,

SD Negeri 207/VI Jambi City. The number of students in the class is 32 students. The research was carried out in class VI because the average activity of the students was not optimal compared to other classes. The object of the research is the problem of weak student activity, so a jigsaw type cooperative learning model was implemented to increase student activity.

Data collection used several techniques, namely: Observations carried out by providing observation sheets on student activity and questionnaires, carried out by distributing questionnaire sheets based on three parameters of student learning activity. Data analysis during research uses quantitative descriptive techniques, which is quantitative research where the data is described using numbers or statistics. The following is a formula for analyzing student learning activity data.

Table 1. Calculation of observation results and student activity questionnaires:

Assessment	Criteria
81-100%	Very Active
61-80%	Active
46-60%	Inactive
≤45%	Very Inactive

Then the results of observing students' active learning are analyzed using the following formula:

$$Presentation = \frac{\text{Total student scores}}{\text{Maximum total scores}} x100\%$$

The implementation of the jigsaw type cooperative learning model is said to be successful if it succeeds in increasing student activity per cycle. Students' learning activeness can be said to have increased, which can be seen from the results of observations where students actively participate in the learning process and can also be seen from the achievement of analysis of observation results.

RESULTS AND DISCUSSION

Based on research that has been carried out starting from cycle I and cycle II, student activity has received a specific increase. The results of this classroom action research concluded that the implementation of the jigsaw type cooperative strategy was successful in increasing the level of students' active learning. It can be seen through the activity of students in the learning process carried out in cycles I and II. Cycle I was implemented in 2 meetings. The time for each meeting was 2 x 35 minutes. In each cycle, research was carried out using

observations of students' activeness when teaching with implementing a jigsaw type cooperative learning strategy in mathematics learning.

The implementation of each cycle is carried out according to the stages of the spiral model according to Kemmis & Mc Taggart, namely planning, implementation, observation and reflection. During the planning stage, several things are prepared, including compiling learning scenarios, compiling LKPD (Learner Worksheets), creating evaluation tools, namely observation sheets, questionnaires and multiple choice questions. The Implementation Stage takes place in several learning activities, namely preliminary activities, core activities and closing activities, and at this stage the observation stage of learning activities is also carried out. The results of observations and student activity questionnaires can be seen in Table 2.

Table 2. Observation Results of Learning Activeness of Cycle I and Cycle II Students

Cycle I			Cycle II		
Meeting	**Percentage (%)**	**Description**	**Meeting**	**Percentage (%)**	**Description**
Meeting 1	77,55	Active	Meeting 1	81,25	Very Active
Meeting 2	97,5	Very Active	Meeting 2	98,75	Very Active
Average	87,52	Very Active	Average	90,00	Very Active

In Table 2, it can be seen that observations of student activity during cycle I obtained an average of 87.52%, which based on the calculation scale falls into the category of very active students. And this has exceeded the success criteria set by researchers, namely 75%. Then, observations of students' learning activity in cycle II increased to 90.00% from 87.52%, which increased by 2.48% and fell into the very active category. Then, to see students' learning activeness against three indicators, namely: 1) being able to measure their own skills and the results obtained, 2) training themselves to be able to solve problems, 3) getting the opportunity to use or apply the things they have obtained to overcome the tasks given. The results of student questionnaires regarding three indicators of student learning activity are in Table 3 below.

Table 3. Results of the Student Learning Activeness Questionnaire for Cycle I and Cycle II

Cycle I			Cycle II		
Meeting	**Presentase (%)**	**Description**	**Meeting**	**Presentase (%)**	**Description**
Meeting 1	52,96	Inactive	Meeting 1	83,98	Very Active
Meeting 2	68,15	Active	Meeting 2	94,65	Very Active
Average	60,55	Inactive	Average	89,31	Very Active

In Table 3, it can be seen that the results of the student learning activity questionnaire for the three categories of student activity in cycle I obtained an average of 60.55%, which fell into the inactive category. And if you look at the expected KKM indicator, which is 75%,

then this percentage does not meet the desired KKM. This is because students have not been able to carry out the jigsaw type cooperative learning process well. During the learning process, there are students who carry out bad activities, for example chatting in class and disturbing other friends. Then, in cycle II, the results of the student learning activity questionnaire increased to 89.31%, which was included in the very active category, meaning the increase from the two cycles reached 28.76%. This is in accordance with research conducted by Yusuf (2018) that the jigsaw learning model for students in class .00%.

The increased activity of students in cycle II was due to reflection on the problems obtained during implementation in cycle I. The results of reflection in cycle I found a number of problems including: 1) Students were still confused about the nature of jigsaw type cooperative learning, this problem was caused by students who are accustomed to using lecture techniques in their learning, 2) Students do not collaborate with members of the expert group when solving problems or assignments, this is shown by the presence of students who talk with their friends, 3) Some expert groups stall for time when discussing so that learning cannot be completed on time, 4) When making presentations, students do not dare to convey actively and creatively, so students only read what they wrote.

Based on the problems in the reflection stage, improvements are needed in the implementation of actions in Cycle II so that indicator achievement can be maximized. Reflection is carried out by looking at problems that need to be changed in learning in cycle II (Saheriestyan et al., 2021). The changes that will be implemented in cycle II are: 1) The researcher will convey continuously about this type of jigsaw cooperative learning, as a result students will understand more about jigsaw learning, 2) The researcher will convey enthusiasm so that students are enthusiastic in conducting discussions, and the researcher will reprimand students who are still talking during the discussion process, as well as giving awards to students who play an active role during the discussion process, 3) Students who take a long time to work on questions or who stall for time will be advised and told that time for implementing learning is very limited, 4) Researchers seeks to tell students to be braver in expressing their opinions, and not to be afraid of making mistakes, because this learning activity can be a forum for them to become more confident in presenting the results of discussions or conveying their opinions in front of many people.

In line with increasing students' learning activeness, it can influence their learning success (Kahar et al., 2020). This can be observed through the results of observations regarding students' activeness in the learning process which can be seen from table 4 which

was carried out at the beginning of the activity and at the end of the following learning activity.

Table 4. Learning activity of Cycle I and Cycle II students

Criteria	Cycle I	Cycle II
Complete (≥80)	82,15	100
Incomplete (≤80)	17,85	-
Mark	100	100
Average	83.21	95

If you look at Table 4, in the first cycle the students who achieved the KKM score were 82.00%, while the students who did not pass the Minimum Completeness Criteria were 17.85%, while the students in the first cycle were 83.21. These results show that students have achieved more than 75% learning completeness, but not all students have achieved learning completeness. And in the second cycle, students' active learning achieved maximum completeness, namely 100% with an average of 95. This shows that cycle II activities went as expected, and students were able to master the concept of the material well. This is in line with research by Asmara, (2020) During the first cycle, the students' average score was 79.58 with completeness being 66%. In cycle II the average score increased to 87.08 with a completion rate of 87%. And this proves that the results of cycle II obtained a relatively good increase.

The findings of this research provide an overview or knowledge for readers, especially teachers, regarding the importance of implementing appropriate learning strategies to increase students' level of active learning. In particular, the jigsaw type cooperative learning strategy, which according to research that has been carried out, can increase students' active learning.

CONCLUSION

From the results of Classroom Action Research (PTK) which was implemented in 2 cycles where each cycle was carried out at most 2 meetings, it can be concluded that students' learning activity can be increased through the implementation of the jigsaw type cooperative learning model in class VI in Mathematics. This can be observed in the results of the average student activity in cycle I which was 87.52% in cycle II, increasing to 90.00%. The same thing was also obtained from the results of the student learning activity questionnaire which obtained an average in cycle I of 60.55% then in cycle II it rose to 89.31%. Based on the results of reflection carried out on students in cycle I, they got a mean of 83.21 and in cycle II, students' learning activeness got a very high average score, namely 95. So it can be said that

the application of the jigsaw cooperative learning model can increase learning activity. students in learning flat shape mathematics.

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