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The Auditory Intelectual Repetition (AIR) Learning Model to Improve Mathematics Problem Solving Ability in Elementary School

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Abstract *. This study aims to improve the mathematical problem-solving skills of fifth grade students of UPT SDN 004 Pulau Terap for the 2022/2023 academic year, with a total of 15 students. This type of research is Classroom Action Research which is carried out in 2 cycles, each cycle being held in 2 meetings. Data collection was carried out by testing problem solving abilities. Teacher and student observation sheets as the level of implementation and achievement in using the Auditory Intellectually Repetition learning model. The results of problem solving abilities can be seen from the results of the pre-cycle, cycle I and cycle II tests. In the pre-cycle test the average score was 57.72 with a learning completeness percentage of 33.33%, in the first cycle test the first meeting increased with an average student score of 65.99 with a learning completeness percentage of 53.33% and in the first cycle the second meeting also experienced an increase with an average score of 74.21 with a learning completion percentage of 66.67%. In the second cycle the first meeting experienced an increase with an average score of 77.93 with a learning completeness percentage of 73.33%, and in the second cycle the second meeting experienced an increase with an average value of 85.38 with an 80% learning completeness presentation. Based on the research results, it can be concluded that the Auditory Intellectually Repetition learning model can improve students' mathematical problem solving abilities in spatial construction material in class V UPT SDN 004 Pulau Terap.*

Keywords: *Problem Solving Ability, Auditory Intellectually Repetition Learning Model, Mathematics*

Introduction

Mathematics is a science that is important for students to master from elementary, secondary to tertiary education levels. Mathematics is a basic science for the development of other sciences. Mathematics is one of the sciences related to reasoning or human thought patterns. In addition, human interaction in everyday life cannot be separated from mathematics (Mulyono, 2020).

The objectives of learning mathematics based on Permendikbudristek No. 7 of 2022 are for capable students to have the following abilities: 1) Understand mathematical concepts, 2) Use reasoning as conjecture in solving problems, 3) Use mindsets to carry out mathematical manipulation which includes solving components problems, 4) Communicating ideas and being able to compile mathematical evidence that shows diversity based on data display to draw conclusions (Fadhilaturrahmi, 2017).

Based on the objectives of mathematics learning, students need mathematical problem solving abilities. Problem solving is an action to resolve a

problem as well as a solution for solving it in various ways (Marta, 2018). The ability to solve mathematical problems is included in one of the objectives learning mathematics according to Polya (Irmayanti, 2019), namely: understanding the problem, making a problem solving plan, carrying out problem solving, re-examining all answers.

Based on the observations that researchers made in class V UPT SDN 004 Pulau Terap, Kuok District, Kampar Regency. In the process of learning mathematics, students are unable to solve problems in questions and students lack the ability to provide solutions to problems given by the teacher, because students prefer to remain silent and accept what the teacher explains and conveys. The low ability of students in solving math problems because, in learning students are not used to thinking more creatively. Teachers usually only provide the fastest formulas so that students can solve mathematical problems that are conceptual, not problem solving problems. Teachers only rely on the examples in the books used by the school. Students only get information from printed textbooks and Student Worksheets (LKS) used by schools so that students get bored while learning.

The low awareness of students' mathematics learning can be seen from the lack of enthusiasm of students to learn during learning, there are still many students who talk to their friends, disturb their friends while studying, do not pay attention to the teacher when explaining, and there are still many who do not prepare mathematics learning tools from home (Yuliani, 2019).

Based on the results of the pre-action value, it was found that the mathematical problem solving abilities of class V students at UPT SDN 004 Pulau Terap were still low, where in the indicator of understanding the problem of 15 students there were 4 students who had completed, on the indicator planning strategies there were 7 people who had completed, the indicator of solving problems there are 6 people who complete, and 1 person who complete on the indicator check again.

Seeing these problems, a way is needed to improve students' mathematical problem solving abilities. One way to make learning in class fun and achieve learning goals is by using a learning model. One model used to improve students' problem solving abilities is the *Auditory Intellectually Repetition* (AIR) learning model.

The Auditory Intellectually Repetition (AIR) learning model is a learning model that prioritizes student activity in listening, speaking, or giving ideas *(Auditory)*, guiding students' problem-solving skills *(Intellectually)* and strengthening student understanding through repetition *(Repetition)* related to the material being studied (Amen, 2022). *The Auditory Intellectually Repetition* (AIR) learning model is a learning model that collaborates several important activities (Muhsyanuur, 2016).

Based on the description above, the researcher wants to conduct Classroom Action Research (CAR) with the title *" Application of the Auditory Intellectually Repetition (AIR) Learning Model to Improve Mathematical Problem Solving Ability in Elementary Schools".*

Method

This research is in the form of classroom action research. More broadly, classroom action research can be interpreted as research that is oriented towards implementing actions with the aim of improving quality or solving problems in a group of subjects studied and observing the level of success or consequences of their actions, to then be given follow-up actions that are improvement of actions or adjustments to conditions and situations. so that better results are obtained (Ananda, 2017). Classroom action research is also a research that was developed based on problems that arise in learning activities that aim to improve and enhance the

teaching and learning process in the classroom (Aprinawati, 2017).

This research was carried out at UPT SDN 004 Pulau Terap, Kampar Regency in class V, totaling 15 people. This Classroom Action Research has been carried out in two cycles, each cycle meeting twice and starting from February to July 2023. The subjects of this study were all 15 students of class V UPT SDN 004 Pulau Terap, consisting of 7 male students and 8 female students. The classroom action research model consists of 2 cycles in which each cycle has four steps, namely: planning , acting , observing , and *reflecting.*

Accurate and complete data is needed in a research process, so to obtain these data various data collection techniques are needed, therefore the data collection techniques used in this study are 3 data collection techniques used, namely tests, observation, and documentation. Meanwhile, the data analysis techniques used are qualitative analysis techniques and quantitative analysis techniques.

Qualitative analysis will be used to analyze the data obtained in the form of words or descriptions of students' mathematical problem-solving abilities using teacher activity observation sheets and student activity observation sheets during the learning process. Meanwhile, quantitative analysis will be used to analyze the value of students' mathematical problem solving abilities. Quantitative data in this study is useful for measuring the extent to which the results of students' mathematical problem-solving abilities increase by using the *AIR learning model.*

After data on students' problem solving abilities is collected through observation, the data is processed using the following percentage formula:

$$\boldsymbol{p = \frac{F}{N} \times 100\%}$$

Information:

P = Percentage Number

F = Searched frequency

N = Many Individuals

100% = Fixed Number

In determining the assessment criteria for the results of the research, a grouping of 5 assessment criteria was carried out, namely very good, good, sufficient, less, and very less. The criteria are as follows.

Table 1. Criteria for Problem Solving Ability

Category	Score
90-100	Very good
79-89	Good
68-78	Enough
57-67	Not enough
<57	Very less

Source: Wardana, 2021.

This research was conducted to determine the level of students' mathematical problem solving abilities at the end of each meeting. Mathematical problem solving ability data is processed using the following formula:

$$\boldsymbol{KI = \frac{Jumlah\ Skor\ yang\ Diperoleh}{Skor\ Maksimal} \times 100\%}$$

To determine classical learning completeness, the following formula can be used:

$$\boldsymbol{KK = \frac{Jumlah\ Siswa\ yang\ Tuntas}{Jumlah\ Siswa\ Seluruhnya} \times 100\%}$$

AIR learning model is said to be successful if it reaches the completeness criteria of 80%. If the average value of students' mathematical problem solving abilities increases in each cycle, then the use of the *AIR learning model* is said to be able to improve students' mathematical problem solving abilities.

Results and Discussion

The results and discussion in this study can be seen from the comparison of students' mathematical problem solving abilities before the action, cycle I, and cycle II in learning using the *AIR learning model* . The low ability of students' mathematical problem solving can be seen from the

indicators of mathematical problem solving ability that have not been achieved that have been set. The initial data on students' mathematical problem solving abilities in class V UPT SDN 004 Pulau Terap can be seen in the table below.

Table 2. Student Problem Solving Ability Test Results in Pre-action

Information	Results
Average	57.7
Category	Not enough
Total amount	5 (33.33%)
Incomplete amount	10 (66.67%)

Source: 2023 Research Data Processing Results

Based on the data in the table above, it can be concluded that students' mathematical problem solving abilities are in the very poor category. Based on the data described above, students' mathematical problem solving abilities have not reached the category determined by the researcher, namely reaching the sufficient category with a minimum score of 70 and have not reached the target determined by the researcher, namely 80% classically. So the researchers made learning improvements through implementing the *AIR* learning model to improve the mathematical problem solving abilities of class V students at UPT SDN 004 Pulau Terap.

The results of students' mathematical problem solving abilities in cycle I can be seen in the following:

Table 3. Results of the Cycle I Mathematical Problem Solving Ability Test

Information	Cycle I	
	PI	PII
Average	6 5.99	7 4.21
Category	Not enough	Enough
Complete	8 (53.33%)	10 (66.67%)
Not Completed	7 (46.67%)	5 (33.33%)

Source: 2023 Research Data Processing Results

Based on these data, the researcher concluded that the implementation of learning in cycle I had increased compared to the pre-action. However, it has not reached the sufficient category with a minimum value of 70 and has not reached the target set by the researcher, namely 80% classically. For this reason, researchers and observers carry out actions in the next cycle, namely cycle II.

The results of students' mathematical problem solving abilities in cycle II can be seen as follows:

Table 4. Results of Cycle II Mathematical Problem Solving Ability Test

Information	Cycle II	
	PI	PII
Average	77,93	85,38
Category	Good	Good
Complete	11 (73.33%)	12 (80%)
Not Completed	4 (26.67%)	3 (20%)

Source: Results of Processed Research Data 202

Based on the data obtained, the researcher concluded that the implementation of learning in cycle II was said to be successful. To clearly understand the increase in each action, see Figure 1 below:

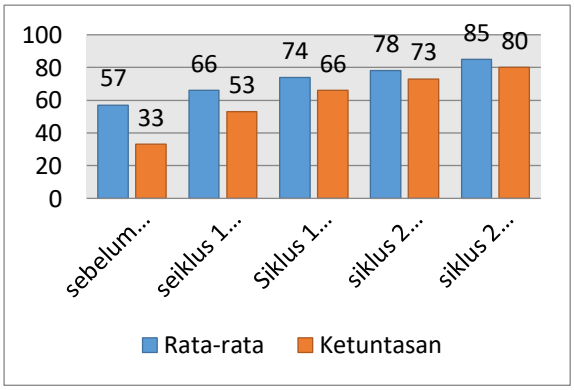

Figure 1. Diagram of Pre-action Students' Mathematical Problem Solving Abilities, Cycles I and II

Based on the results of the implementation of cycle 1 learning, it is still not optimal. Students are not able to solve questions properly and correctly. Students also cannot know what is being asked and what is known, whereas in mathematical problem solving abilities knowing what is being asked and what is known is an important indicator of problem solving ability. In addition, students are less able to solve problems and students do not

re-check the correctness of the process and answers as contained in the problem solving indicators. Students are expected to increase cooperation and responsibility when given the opportunity to move forward. Due to the lack of teacher supervision of students when students are working on group assignments, students grab when doing group assignments, so that there are still students who do not work on completing group assignments.

Based on the results of observations of the implementation of learning carried out well, even though there were some obstacles in cycle 1 due to the lack of mastery of the class by the teacher and the application of the AIR model steps which were not well understood by students. Based on the four indicators used, the highest student score is found in the second indicator, namely planning strategies. Meanwhile, the lowest student scores were found in the fourth indicator, namely re-checking the correctness of the process and answers.

Cycle II, has gone better than cycle 1. This is indicated by students paying more attention to the teacher when the teacher delivers learning material, students are also more active in the learning process, and have developed a sense of confidence when carrying out tournaments in front of the class. can work well with group members. Based on the four indicators used, the students' scores have reached the Minimum Completeness Criteria (KKM), namely 71 as many as 12 students with an average score of 85.38 in the good category.

Based on the results of the implementation of learning in the first cycle and second cycle of mathematics subjects using the *Auditory Intellectually Repetition* (AIR) learning model can increase teacher activity and student activity.

Conclusion

Based on the results of research conducted by researchers using the *Auditory Intellectually Repetition (AIR)* learning model , it can improve students' mathematical problem solving abilities in geometric material in class V UPT SDN 004 Pulau Terap. The results of problem solving abilities can be seen from the results of the pre-cycle, cycle I, and cycle II tests. In the pre-cycle test the average score was 57.72 with a learning completeness percentage of 33.33%, in the first cycle test the first meeting increased with an average student score of 65.99 with a learning completeness percentage of 53.33% and in the first cycle the second meeting also experienced an increase with an average value of 74.21 with a percentage of learning completeness of 66.67%. In the second cycle the first meeting experienced an increase with an average score of 77.93 with a learning completeness percentage of 73.33%, and in the second cycle the second meeting experienced an increase with an average value of 85.38 with an 80% learning completeness presentation. Based on the results of the study, it can be concluded that *the Auditory Intellectually Repetition (AIR)* learning model can improve students' mathematical problem solving abilities in geometric material in class V UPT SDN 004 Pulau Terap.

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